

# Examining Culturally Structured Learning Environments With Different Types of Music-Linked Movement Opportunity

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*This study describes two experiments that extended earlier work on the Afro-cultural theme Movement Expression. The impact of various learning conditions characterized by different types of music-linked movement on story recall performance was examined. African American children were randomly assigned to a learning condition, presented a story, and tested on story recall. In Experiment 1 (N = 48), the authors confirmed the basic finding of Boykin and colleagues that learning conditions with polyrhythmic-percussive music type and high movement opportunity enhanced story recall better than other types of music-linked movement. In Experiment 2 (N = 128), the authors compared story recall in different music-linked movement conditions across grade levels and established improvement only for fourth graders in the learning condition with polyrhythmic-percussive music and high movement. Both fourth and sixth graders' lowest performance was in the condition devoid of any music or movement. Finally, a positive relationship was observed between performance and children's mood state in each learning condition. Movement Expression as a powerful tool for classroom learning for African American children is discussed.*

**Keywords:** *culture; African American children; music; learning environments*

This research addresses the persistent issue of how to create effective learning environments to improve academic performance among low-income African American children. In this era of No Child Left Behind, a mandate allegedly poised to alleviate the underachieving profile of poor

and minority students, African Americans consistently score lower than European Americans in reading, mathematics, and science (National Center for Education Statistics, 2006; Valenzuela, Preito, & Hamilton, 1997). The implications of these findings are quite serious and question whether America as an industrialized society can maintain its dominance and leadership if a meaningful percentage of its population is seriously marginalized because they failed to master basic skills (Grossberg, 2005).

Why are innovations to ameliorate low academic achievement for African American children unsuccessful despite federal education mandates and genuine efforts to provide a positive classroom environment? The answer to this question is situated in the preponderance of psychological research that focuses on factors such as devalue of education, negative academic self-concept, and threatened cultural identity (Cokley, 2003; Graham, 1994; Ogbu, 2003; Steele, Spencer, & Aronson, 2002). These studies consistently minimize contextual, cultural, and structural organization factors that underlie educational disparities. Arguably, these factors explain why countless traditional academic innovations fail and result in many African American children feeling disconnected and uninterested in the learning environment (Boykin, Miller, & Tyler, 2005; Lee, 2000). Because of our society's increasing dependence on the optimal development of all children, academic disparities and the contextual conditions fostering them are problems that must be explored.

Research studies investigating effective learning environments demonstrate that an important factor influencing academic achievement is learning through meaningful and active engagement. Greenwood, Hart, Walker, and Risley (1994) found that pedagogy used in inner-city classrooms tended to promote low rates of student engagement. Conversely, active student engagement has been found to improve the academic achievement of students (Gardner, Heward, & Grossi, 1994). Students who are actively engaged have high rates of on-task behavior and low rates of disruptive behavior (Lambert, 2001). It has long been suggested that many African American children in low-income inner city schools are mislabeled with behavioral problems and disengaged because of their participation in classroom activities that are disconnected from their everyday culturally meaningful experiences (Delpit, 2003; Gallego & Cole, 2001; Moll & Greenberg, 1990).

Currently, there is a small yet growing community of scholars producing empirical evidence of the benefits of culturally meaningful learning

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environments for African American children (Boykin, 1986, 1994; Boykin & Bailey, 2000; Boykin et al., 2005; J. M. Cole & Hillard, 2006; Lee, 2001; Pinkard, 2001). It is our position that the traditional culture of American schools, which restricts physical movement and favors learning impassively, is disadvantageous to many African American children who inherit a rich tradition of using expressive movement as part of their everyday learning and communicative behavior. We propose to help bridge the gap between the cultural practices of the ordinary American classroom and the practices of many African American children nurtured in homes that privilege a cultural ethos deep in expressive movement by experimenting with the creation of effective learning conditions. In this study, we explicitly explored a cultural asset, movement expression, and its enhancement effects on African American children's story recall performance. Of special interest in this study was discerning the facilitative nature of different types of music-linked movement combinations.

#### THEORETICAL RATIONALE

The theoretical rationale for this study integrates sociocultural models of learning and development and Boykin's Afrocultural meaning system model. Take together, we believe these perspectives hold special promise for advancing optimal learning environments for African American children.

*Sociocultural theory.* The sociocultural perspective in cognitive development stresses that the manner in which an individual makes meaning of the world is mediated through society and culture (Bruner, 1996; M. Cole, 1996; Kozulin, 2002; Rogoff, 2003; Shweder, 1999). Furthermore, the extent to which a learner engages in a task largely depends on the cultural content of the task and the familiarity of the context in which the information is presented (Hatano & Wertsch, 2001; Valsiner & Van Der Veer, 2000). Thus, it is possible to organize effective contexts for classroom instruction by taking into account local variations in culture and social class (Tharp & Yamauchi, 2000). Contextualized learning occurs when education is situated in meaningful real-world tasks. An authentic task, activity, or goal makes learning more profound by placing the student in the center of the domain context and culture. Contextualized learning gives the student an opportunity to acquire, develop, and use the cognitive tools needed to learn and master the task. Furthermore, a contextualized learning environment puts students in contact with "communities of practice" that allow students to obtain knowledge and skills from the experts and embrace the beliefs and behaviors of the community (Lave, 1997). Review of existing strategies to

improve academic outcomes revealed that many do not extend students' out-of-school activities and practices into classroom instruction (Alvermann, 2000; Bean & Readence, 2002; Guthrie & Davis, 2003; Moje, 2002), and even fewer take into consideration the importance of building on students' home language and culture, although the positive effect of using this strategy has been repeatedly documented in the literature (Gallego & Cole, 2001; Labov, 2003; Lee, 2000; Moll & Greenberg, 1990).

*Afrocultural meaning system model.* Influenced by the sociocultural perspective, Boykin (1986, 2000) introduced the idea of an Afrocultural tool kit or meaning system on which African American children draw for communication, negotiation, reasoning, problem solving, and participation in various activities across multiple contexts. This notion of an Afrocultural meaning system includes a compilation of cultural themes, traditions, values and ideals, and ways of acting and thinking that are essential in the acquisition of intellectual skills and competencies (Boykin, 2000; Gordon, 1995). These themes include movement expression, communalism, verve, orality, spirituality, affect, harmony, and social time perspective. Other scholars also adhere to the notion of an Afrocultural meaning system and have conducted work on these themes as learning orientations in educational contexts (Akbar, 1976; Gay, 1987; Hale-Benson, 1986; Lee, 2007; Morgan, 1976; Nobels, 1991). It is believed by Boykin and associates that cognitive competency underlying academic tasks is not acquired in culturally neutral contexts (Boykin, 2000; M. Cole, 1996; Rogoff, 2003). Moreover, research studies originating from this model have continued to support optimal learning performance for African American children when the learning environment capitalizes on the Afrocultural meaning system (Allen & Boykin, 1992; Boykin & Bailey, 2000; Boykin & Cunningham, 2001; Hurley, Boykin, & Allen, 2005; Serpell, Boykin, Madhere, & Nasim, 2006).

#### MOVEMENT EXPRESSION

Movement expression is defined as a premium on the interconnectedness of music-linked movement, rhythm, percussive dance, kinesthetic movement, and gestures. Movement expression is further reflected in a rhythmic orientation toward life as manifested in African Americans' characteristic patterns of speech and activity. Conceptually, movement and music are viewed by many in the African American community as ways of engaging life. Individuals possessing a rich movement expressive repertoire are likely to move around and listen to music because it is vital to psychological health and performance, not solely for pleasure (Boykin, 1994;

McLean-Cole, 2000). Research has confirmed movement expression to be consistent with traditional west African cultural ethos and prominent in the behavioral repertoires and everyday practices of many African Americans (Abrahams & Szwed, 1983; Akbar, 1976; Boykin, 2000; Hale, 2001; Hilliard, 1992; Nobels, 1991; Shade, 1989; Thompson, 1984; White & White, 1998).

Studies on movement expression have included both ethnographic observations and experimental investigations demonstrating cultural salience and learning enhancement. First, early ethnographic studies revealed expansive movement and behavioral differences between Black and White preschool children, such that Black children participated in more various mobile activities and generally displayed more movement compared to low-income and middle-income White children (Guttentag, 1972). Additional studies showed higher levels of expression, maternal rhythmicity, and precocity in motor skills and physical energy in Black children than in White or Navajo children (Hale-Benson, 1986; Morgan, 1976). Later, experimental studies of movement expression with randomized groups showed the beneficial nature of incorporating music and the opportunity for movement into the learning context for low-income African American children. Boykin and Allen (1988) studied the recall performance of 50 children 5 to 6 years old and 40 children 8 to 9 years old on picture paired-associated tasks in learning conditions that either provided rhythmic music-linked movement or not. Findings showed that retention of the picture pairs was superior in the rhythmic movement condition. The effect was even stronger for younger children who came from homes encompassing high levels of stimulation and movement expressiveness. In another study conducted by Allen and Boykin (1991), 40 African American and 32 European American low-income children learned to pair pictures in a condition that allowed them to coordinate movement with music and in a condition that allowed for little movement opportunity and no music. The children were subsequently tested for picture pair retention in a condition where music was either present or absent. Results showed that African American children's performance was superior in the learning condition with high movement expressiveness, whereas European American children's performance was superior in the learning condition with low movement expressiveness. Furthermore, the presence of music during the testing condition independently enhanced the performance of African American children only.

Others researchers have explored the influence of movement expression on various cognitive tasks such as mapping, encoding, and analogical reasoning (Allen & Butler, 1996; Boykin & Cunningham, 2001). Taken together, these studies have offered convincing evidence about the cognitive advantages afforded to children when the learning environment accommodates

their cultural style of knowing and reasoning. Researchers conducting work in the movement expression paradigm are now in a position to develop prescriptive pedagogy for teachers and other stakeholders interested in using culturally specific ethos as a tool to design effective learning contexts.

This research study tackles this challenge by answering the practical question of which type of music-linked movement combination best facilitates learning for African American children. Specifically, do different types of music interfere with performing certain cognitive tasks (e.g., reading) and assist others (e.g., memorizing math facts)? To date, the empirical studies on movement expression within Boykin's Afrocultural model have employed only a music type that was of a polyrhythmic or syncopated nature (Allen & Boykin, 1992; Boykin & Cunningham, 2001). Polyrhythmic or syncopated music is generally described as the simultaneous sounding of two or more independent rhythms and multiple shifts or accents in music that occurs when a normally weak beat is stressed (Hammond, 1998). Without empirical evidence, this type of music was concluded to be superlative for African American children. It is unclear whether this is the only type of music that would support story recall performance for African American children. A review of literature in music and experimental psychology indicated that the question of music type is complex and has yielded many inconsistencies (Schellenber & Trehub, 1999; Strickland, 2001-2002).

Another important factor yet to be addressed in previous movement expression research is the affective domain. Not surprising, research on the motivational antecedents to successful cognitive task performance has indicated that children with more positive affect are more motivated to perform (Baker & Wigfield, 1999; McKenna, Kear, & Ellsworth, 1995). The strategies children use to recall, solve problems, encode, store, and organize are influenced by affect (Bryan & Bryan, 1991; Isen, 1999; Zajonc, 2000). Given that both movement expression and affect are contextual facilitators, it proves valuable to know the relationship between positive affect and learning environments among African American children experiencing academic difficulties.

A final issue is generality of the effects of a movement expressive learning condition across grade levels. Previous studies have examined only children between the ages of 5 and 9. It is unclear how older children, with advanced cognitive abilities, would respond to a learning environment with music-linked movement.

#### STUDY OBJECTIVES

This study sought to address the gaps in the earlier work on the Afrocultural theme movement expression by examining the impact of various

learning conditions characterized by different types of music-linked movement on story recall performance in two experiments. The objectives were to (a) measure the effects of polyrhythmic-percussive music and high movement opportunity on a real academic task (story recall; Experiment 1), (b) compare story recall performance in different music-linked movement conditions across grade levels and discern developmental differences (Experiment 2), and (c) observe the relationship between performance and children's reported positive affect. Given previous research, the central prediction for both experiments was that children's performance would be highest in the condition with polyrhythmic-percussive music and high movement opportunity and lowest in the control conditions with other types of music and movement. Other predictions were that overall performance would be higher for sixth graders than for fourth graders, that both fourth and sixth graders' performance would be highest in the condition with polyrhythmic-percussive music and high movement opportunity, and that there would be a significant relationship between performance and positive affect.

## EXPERIMENT 1

### METHOD

#### Participants

The participant sample consisted of 48 African American children (24 males and 24 females). Participants were fourth graders with ages ranging from 8 to 10 years old ( $M = 9.35$ ,  $SD = 0.51$ ). The children were selected from a public school in moderate-sized city in southern California. Children were from low-income families, as indicated by their participation in the school's free lunch program.

#### Materials

*Music.* Two instrumental musical selections were utilized for the experimental learning conditions. The song titles are "Somewhere Over the Rainbow" (Mancini, 1972) and "Barney's Theme Song," from a children's television program. These musical pieces were selected because of their similarity in genre, tempo, timbre, melodic phrases, harmonic sequences, and moods induced by the music. Both musical selections were altered to produce syncopated and nonsyncopated variations by using 386-SX computer sequencing software. The music was mixed and arranged to either simulate or eliminate syncopation, polyrhythmic beats, and percussion.

The end result was four distinctive musical pieces. Four audiocassette recordings were made and labeled Rainbow–Syncopated Variation, Rainbow–Nonsyncopated Variation, Barney–Syncopated Variation, and Barney–Nonsyncopated Variation. Each of the four music types was counterbalanced so that each variation was presented an equal number of times during the learning contexts. A standard tape cassette player was used to play the musical pieces.

*Story.* A children’s story written by Julius Lester (1989), titled “Why the Sun and Moon Live in the Sky,” was read aloud in each learning condition. Julius Lester’s short stories are developed for children between 7 to 10 years of age with reading levels between the second and fourth grade. When read at normal speaking pace, the stories are approximately 3 minutes in length.

## Instruments

*Story recall performance test.* A 10-item questionnaire, created by the investigators, assessed recall of the story content presented during the learning conditions. The questionnaire required students to engage in two types of cognitive processing, encoding and inference. Encoding questions asked students to recall central themes and characters from the story, whereas inference questions required students to deduce relationships between characters and themes in the story. The questions were open ended but phrased to elicit only one correct answer. Each correct response was worth 1 point. Students’ total scores were calculated by summing the number of points across the 10 items. Possible scores therefore ranged from 0 to 10, with the highest score representing greater story recall performance.

*Mood questionnaire.* Adapted from the Profile of Mood Scale (McNair, Lorr, & Droppleman, 1992), this 12-item descriptive measure observes changes in students’ affect as a result of participation in the learning condition. Children rated each of the 12 items on a 4-point Likert-type scale (0 = *not at all*, 1 = *a little like this*, 2 = *somewhat like this*, and 3 = *a lot like this*). Each of the items falls into one of the following four dimensions: Pleasantness, Engagement, Positive Affect, and Negative Affect. Each mood subscale was derived from an oblique factor analysis and was reliably replicated in six studies (Lorr, McNair, & Droppleman, 1990). The Pleasantness subscale refers to generalized states of discomfort and irritability and includes mood adjectives such as agreeable, calm, and tense. The Engagement subscale is defined by mood states suggesting high attention and clarity and includes adjectives such as alert, tired, and confused.

The Positive Affect subscale refers to ebullience or friendliness and includes adjectives such as cheerful, confident, and energetic. Finally, the Negative Affect subscale represents feelings of anger, grouching, doubt, and annoyance. Mood adjectives such as angry, unsure, and discouraged were categorized under the Negative Affect mood dimension. The sum for the items defining each subscale was calculated, and the total possible score for each subscale was 9. McNair and Lorr (1994) reported internal consistency for the four subscales: Pleasantness ( $\alpha = .70$ ), Engagement ( $\alpha = .60$ ), Positive Affect ( $\alpha = .75$ ), and Negative Affect ( $\alpha = .80$ ). In this study Cronbach's alpha for the subscales were as follows: Pleasantness ( $\alpha = .80$ ), Engagement ( $\alpha = .65$ ), Positive Affect ( $\alpha = .74$ ), and Negative Affect ( $\alpha = .74$ ). Although moderate, these reliabilities are comparable with reliabilities for mood state measures and within the expected range given to children and adolescents (Lubin et al., 1994).

### Learning Conditions

Four learning conditions were utilized in which a story was orally presented with different movement-music combination. These music-movement combinations included the following: (a) high movement opportunity and syncopated music (HMSYN), (b) low movement opportunity and syncopated music (LMSYN), (c) high movement opportunity and nonsyncopated music (HMNSYN), and (d) low movement opportunity and nonsyncopated music (LMNSYN).

*Condition 1: HMSYN.* This condition is consistent with the movement expressive learning context described in the previous studies (Allen & Boykin, 1991; Boykin & Allen, 1988) and entailed vast polyrhythmic syncopated music and expressive movements. In this context, the children entered the room and heard a syncopated musical tune playing from the cassette recorder until seated in the circle. Once seated, the music was turned off by the research assistant and the experimenter read the HMSYN script (see the appendix). After the script, the music was turned on and the experimenter rhythmically read the story to the beat of the music while verbally and physically encouraging movement.

*Condition 2: LMSYN.* This learning condition was constructed to observe the impact of syncopated music in the absence of movement. Children assigned to this condition entered the room and heard a syncopated musical tune playing from the cassette recorder until seated in the circle. Once seated, the music was turned off by the research assistant and the

experimenter read the LMSYN script (see the appendix). Afterward, music was turned on and the experimenter rhythmically read the story, without encouraging movement. However, if the students began to move their bodies to the beat of the music, the experimenter did not discourage the movement.

*Condition 3: HMNSYN.* In contrast to Context 2, this context was constructed to allow high levels of movement in the absence of syncopated music. Children under this condition entered the room and heard a nonsyncopated musical tune playing from the cassette recorder until seated in the circle. Once seated, the music was turned off by the research assistant and the experimenter read the HMNSYN script (see the appendix). After the script, music was turned on and the experimenter read the story in a normal speaking voice at a moderate pace to the nonsyncopated tune playing in the background while verbally and physically encouraging movement.

*Condition 4: LMNSYN.* The LMNSYN context is characterized by its nonpolyrhythmic musical beat, which is argued to decrease the amount and kind of movement opportunity (McLean-Cole, 2000). In this context, the children entered the room and heard a nonsyncopated musical tune playing from the cassette recorder until seated. Approximately 1 minute after the children were seated, the music was turned off by the research assistant. The experimenter read the LMNSYN script (see the appendix). After the script, the music was turned on by the research assistant. The experimenter read the story in a normal speaking rate to the nonsyncopated musical tune. Students were not verbally or physically encouraged to move their bodies in this condition by the experimenter. However, when students moved their bodies to the music in a swaying motion, for instance, the experimenter did not discourage the movement.

## Procedure

There were two phases of this experiment: a learning phase and testing phase. The learning phase took place in a vacant classroom with a semicircle of six chairs neatly arranged along with a cassette recorder. For the testing phase, desks were equally spaced from one another in the rear of the classroom with pencils and testing materials. Students were randomly assigned to one of the four learning conditions and participated in groups of six, equally composed of males and females. Four African American research assistants (three female and one male) served as experimenters and were trained in facilitating and administering the learning conditions and

testing phase. Once seated in chairs directly facing the experimenter, the learning phase began. Children were told that after the story presentation they would be asked to complete a mood questionnaire and answer questions about the story. After the learning phase, the experimenter escorted the children to desks situated in the rear of the classroom for testing. The experimenter informed students that their performance scores were confidential. First, students completed the mood questionnaire and then the story recall test. Each question was read aloud while the students wrote their responses. One minute was allowed for each question. The time to complete the entire experiment was 30 minutes. On completion, students were debriefed and escorted back to their classrooms.

## RESULTS

Preliminary analyses were performed to discern whether there were performance differences because of musical selections (“Rainbow” or “Barney”). No significant effects emerged and were therefore dropped from further analyses.

Table 1 displays a summary of the findings. A 2 (gender)  $\times$  4 (learning condition) between-subjects ANOVA was performed on the dependent variable, story recall performance. A significant main effect emerged for learning condition,  $F(3, 47) = 6.72, p < .001$ . Results indicated children’s story recall was highest in the HMSYN and lowest in the LMNSYN learning condition. Post hoc analyses using Scheffe revealed that children’s cognitive performance in the LMNSYN ( $M = 3.50, SD = 1.83$ ) learning condition was significantly lower than in all other conditions. Furthermore, children’s performance in the HMNSYN ( $M = 6.00, SD = 1.75$ ) and LMSYN ( $M = 6.25, SD = 2.05$ ) learning conditions were not significantly different from one another. No significant main effect for gender or interaction effects emerged.

A correlation analysis was conducted to examine the relationship between children’s story recall and mood. Results showed a significant positive relationship between performance and mood such high performance was associated with greater feelings of Pleasantness ( $r = .56, p < .001$ ), Engagement ( $r = .27, p < .001$ ), and Positive Affect ( $r = .35, p < .001$ ). A significant negative correlation emerged for the Negative Affect subscale ( $r = -.38, p < .05$ ), such that greater negative affect was associated with lower performance. Table 2 illustrates the correlation matrix for the mood subscales dimensions (Pleasantness, Engagement, Positive Affect, and Negative Affect) and cognitive performance.

**TABLE 1**  
**Experiment 1: Descriptive Statistics for Cognitive Performance**

<i>Context</i>	<i>Gender</i>	M	SD	n
HMSYN	Male	6.90	2.14	6
	Female	6.77	1.84	6
	Total	6.83**	1.99	12
LMSYN	Male	6.12	1.98	6
	Female	6.38	2.12	6
	Total	6.25	2.05	12
HMNSYN	Male	6.08	1.87	6
	Female	5.92	1.63	6
	Total	6.00	1.75	12
LMNSYN	Male	3.23	1.98	6
	Female	3.77	1.68	6
	Total	3.50**	1.83	12

NOTE: HMSYN = high movement and syncopated music; LMSYN = low movement and syncopated music; HMNSYN = high movement and nonsyncopated music; LMNSYN = low movement and nonsyncopated music.

\*\* $p < .01$ .

**TABLE 2**  
**Experiment 1: Correlation Matrix for Mood and Cognitive Performance**

<i>Mood Dimension</i>	<i>Cognitive Performance</i>
Pleasantness (calm, agreeable, tense)	.56**
Engagement (alert, tired, confused)	.27*
Positive affect (cheerful, energetic, confident)	.35*
Negative affect (angry, discouraged, unsure)	-.38*

\* $p < .05$ . \*\* $p < .01$ .

## DISCUSSION

The results of Experiment 1 are consistent with previous findings and support our predictions. That is, children's highest performance was in the condition with polyrhythmic-percussive syncopated music and high movement opportunity. Children's performance was greater with the presence of some form of syncopated or rhythmic music or high movement opportunity than in the absence of it, as in the case of the learning condition with low movement and nonsyncopated music. The prediction of a relationship between mood and story recall performance was also supported. The subscales, Negative

Affect, Pleasantness, Engagement, and Positive Affect, all correlated with performance, providing additional information about mediating factors of culturally structured learning environments.

## EXPERIMENT 2

Experiment 2 examined whether older children would perform differently than younger children in learning conditions varying in music-linked movement and if differences existed in children's mood state as a result of the learning conditions. The findings in Experiment 1 showed no significant differences on performance in the learning conditions with HMNSYN or LMSYN. Therefore, both these learning conditions were excluded in Experiment 2, and a controlled learning condition devoid of any music or movement was added. A second change in the procedure of Experiment 2, repeated measures on all three learning conditions, was adopted to strengthen the power of the design and ensure individual differences in mood state were minimized across conditions. Again, we hypothesized that all children's task performance would be highest in the learning condition with high syncopated music and movement opportunity than in the other music-linked movement conditions. Moreover, older children's performance would be significantly higher than younger children's performance in all three learning conditions. We also predicted that performance in the learning condition with syncopated music and high movement opportunity would correlate more strongly with positive affect more than in the other learning conditions.

### METHOD

#### Participants

Participants were 128 children (62 males, 66 females), 64 fourth graders ages 9 to 10 ( $M = 10.4$ ,  $SD = 0.43$ ) and 64 sixth graders ages 11 to 12 ( $M = 12.1$ ,  $SD = 0.71$ ). All were selected from two public schools, and income demographics were similar to those in Experiment 1.

#### Materials

*Music.* The same musical selections from Experiment 1 were used in Experiment 2.

*Story.* Three stories written by the same author in Experiment 1, Julius Lester (1989), titled “Why Dogs Chase Cats,” “Why Monkeys Live in Trees,” and “Why the Sun and Moon Live in the Sky,” were used in Experiment 2.

## Instruments

Similar measures used in Experiment 1 were used in Experiment 2, with one change: The story recall performance test was increased from 10 items to 20 items to avoid ceiling effects that may occur with older children. The test was equally composed of encoding and inference questions in an open-ended format. The total possible score on the test is 20 points.

## Learning Conditions

Three learning conditions were employed: HMSYN, LMNSYN, and control. Experiment 1 provides description of the HMSYN and LMNSYN. In the control condition, children were instructed by the experimenter to sit very still while they listened to a story with no music playing.

## Procedure

Experiment 2 procedures were similar to those in Experiment 1 but required children to participate in all three learning conditions. Children completed the instruction and testing phases for each condition. Each learning condition employed a different story to avoid practice effects. All stories, the order of presentation, and the learning conditions were counterbalanced to eliminate confounds. The three learning conditions were separated by a 10-minute break, with each condition taking about 25 minutes.

## RESULTS

*Learning conditions and story order effects.* No significant effects emerged for order of learning condition or story presentation and therefore were dropped from further analyses.

*Story recall performance.* Means, standard deviations, and sample sizes for all variables are presented in Table 3. A multifactorial 2 (gender)  $\times$  2 (grade level)  $\times$  3 (learning condition) ANOVA with repeated measures revealed no significant effect for gender, but a significant effect emerged for learning condition,  $F(2, 125) = 77.59, p < .001$ , grade level,  $F(1, 128) = 22.95, p < .01$ , and an interaction between learning condition and grade

level,  $F(1, 125) = 22.75, p < .001$ . For learning condition, children's story recall performance was highest in the HMSYN with polyrhythmic-percussive syncopated music and movement and lowest in the control condition void of music and movement. Scheffe test showed that means scores for performance in the HMSYN ( $M = 11.66, SD = 4.33$ ) and LMNSYN ( $M = 10.94, SD = 5.46$ ) learning conditions were significantly higher than in the control ( $M = 7.43, SD = 5.07$ ) but not significantly different from each other. The grade level main effect revealed that sixth graders' overall performance ( $M = 11.51, SD = 5.03$ ) was significantly higher than fourth grade children's overall performance ( $M = 8.32, SD = 11.51$ ).

The interaction effect indicated fourth graders' highest story recall in the HMSYN learning condition ( $M = 11.45, SD = 4.45$ ), whereas sixth graders' highest performance was in the LMNSYN learning condition ( $M = 13.35, SD = 5.44$ ). Lowest performance for both fourth graders ( $M = 5.28, SD = 3.61$ ) and sixth graders ( $M = 9.35, SD = 5.42$ ) was in the control learning condition. Figure 1 displays the interaction effect. Scheffe test indicated within group performance differences in the LMNSYN and control learning conditions. However, there was no significant difference obtained between the HMSYN learning condition for sixth graders ( $M = 11.85, SD = 4.25$ ) and fourth graders ( $M = 11.45, SD = 4.45$ ).

*Mood.* Several correlational analyses were performed to examine if a relationship existed between children's story recall performance and mean scores on the mood subscales: Pleasantness, Engagement, Positive Affect, and Negative Affect. Results revealed a positive correlation between performance and the Positive Affect ( $r = .466, p < .01$ ) and Pleasantness ( $r = .302, p < .05$ ) subscales in the HMSYN learning condition. A significant negative correlation emerged between performance and the Negative Affect subscale in the control learning condition ( $r = .498, p < .01$ ). There was no significant relationship between mood and performance in the LMNSYN conditions. These findings indicate that the learning condition with syncopated music and high movement is associated with the most positive affective elements than the other learning conditions in this study. Table 4 illustrates the correlation matrix for mood dimensions and performance by learning conditions.

## GENERAL DISCUSSION

It has long been recognized that culture is very difficult for humans to think about because, like a fish in water, we fail to "see" culture because it is the medium within which we exist (M. Cole, 1996). For researchers interested

**TABLE 3**  
**Experiment 2: Descriptive Statistics for Cognitive Performance**

<i>Context<sup>a</sup></i>	<i>Overall</i>		<i>HMSYN</i>		<i>LMNSYN</i>		<i>Control</i>	
	M	SD	M	SD	M	SD	M	SD
HMSYN	11.66*	4.33	—	—	—	—	—	—
Male	11.77	4.84						
Female	11.90	4.14						
LMNSYN	10.94	5.46	—	—	—	—	—	—
Male	10.12	5.98						
Female	10.38	5.12						
Control	7.43*	5.07	—	—	—	—	—	—
Male	7.23	5.98						
Female	7.77	5.68						
Grade								
Fourth <sup>b</sup>	8.32**	5.51	11.45	4.45	8.23**	4.04	5.28*	3.61
Male	8.11	5.22	11.31	4.67	8.51	3.96	5.44	3.39
Female	8.40	5.47	11.56	4.38	8.12	4.10	5.12	3.55
Sixth <sup>b</sup>	11.51**	5.03	11.85	4.24	13.35**	5.44	9.35**	5.42
Male	11.46	5.10	11.77	4.09	13.38	5.71	9.40	5.13
Female	11.46	4.98	11.23	4.37	13.12	5.57	9.68	5.72

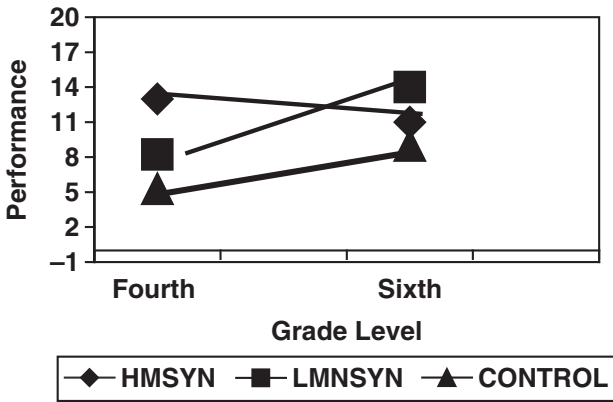
NOTE: HMSYN = high movement and syncopated music; LMNSYN = low movement and nonsyncopated music.

a.  $n = 128$ .

b.  $n = 64$ .

\* $p < .05$ . \*\* $p < .01$ .

in creating and examining culturally structured learning environments for African American children, this presents many challenges. It is imperative to understand and define what are the meaningful practices, values, and activities of a group and whether they are salient across generations. For example, it has been argued that there are numerous musical genres in the African American community serving as the backdrop to the activities in which they participate (McLean-Cole, 2000). Knowing which type of music would contribute to successful learning outcomes for African American children today is more complex given social, historical, and technological changes among youth in America. Another hurdle to overcome is based on the premise that differences in cognitive styles or ways of knowing and thinking are synonymous with deficiencies in cognitive abilities. It would be a fallacy to conclude from this study that all African American children require a singular type of music and movement to learn and, unable to learn without it, are thus limited in their cognitive ability.



**Figure 1: Experiment 2: Learning Context by Grade**

NOTE: HMSYN = high movement and syncopated music; LMNSYN = low movement and nonsyncopated music; Control = no movement and no music.

**TABLE 4**  
**Experiment 2: Correlation Matrix for Performance and Mood Subscales**

Mood Dimension	Cognitive Performance		
	HMSYN	LMNSYN	Control
Pleasantness (calm, agreeable, tense)	.302*	.002	-.025
Engagement (alert, tired, confused)	.128	.085	.008
Positive affect (cheerful, energetic, confident)	.466**	-.023	-.084
Negative affect (angry, discouraged, unsure)	-.036	.144	.498**

NOTE: HMSYN = high movement and syncopated music; LMNSYN = low movement and nonsyncopated music.

\* $p < .05$ . \*\* $p < .01$ .

Therefore, with these challenges in mind, the two experiments featured in this study sought to clarify and further document the facilitative effects of movement expression on story recall performance among African American children. In comparison to other studies in the movement expression paradigm, a major strength of this study was its ability to unpack the Afrocultural construct and critically examine whether the type of music or type of movement in the learning condition was responsible for the enhancement effects.

We predicted a learning condition infused with polyrhythmic-percussive syncopated music and high movement opportunity would increase story recall better than other types of music-movement combinations. Moreover, we expected this trend to continue across grade levels and be related to children's mood state, which was also believed to affect cognition.

The findings from Experiment 1 provided the necessary empirical evidence to confirm that the type of music and movement utilized in previous movement expression studies is superior over other types of music-linked movement combinations. The operational definition of movement expression was validated, and indeed polyrhythmic-percussive syncopated music and high movement opportunity optimized story recall performance. It is interesting that our results contradict a great deal of the psychological research asserting the distractibility of syncopated and percussive music (Chamorro-Premuzic & Furnham, 2007; Fox & Pierce, 1996; Furnham & Stanley, 2003; Furnham, Trew, & Sneade, 1999; Tucker & Bushman, 1991; Wallace, 1994; Yilas & Heaven, 2003). Many of these researchers maintained that only music types similar to the classical genre enhance cognition (Butzlaff, 2000; Hallam, Price, & Katsarou, 2002), and this was not the case for the children in this study by evidence of low performance in the nonsyncopated percussive music condition.

Another noteworthy finding from Experiment 1 was that children performed better with the presence of some form of syncopated or rhythmic music or high movement opportunity than in the absence of it, as in the case of the learning condition with low movement and nonsyncopated music. The HMNSYN and the LMSYN learning conditions, although not optimal, still provided a necessary level of stimulation for cognitive facilitation uncommon in traditional classrooms. These findings appear to have continuity with the work of Bailey and Boykin (2001), demonstrating enhanced performance when tasks are presented in a variable manner with high stimulation. As we progress toward prescriptive pedagogy, one might conclude that learning environments providing some music and opportunities for movement in isolation could produce slight improvements in learning; however, the greatest impact results from the combination of the two, specifically a music type with polyrhythmic-percussive syncopation and high movement opportunity.

Results from Experiment 2 raised questions regarding the developmental parameters of a structured learning environment using movement expression as a facilitator of learning among African American children. Again in comparison to other examinations of movement expression, a major strength in this study was its inclusion of children older than 9, which is an important step toward prescriptive pedagogy. Our findings showed

that sixth graders displayed higher story recall than did fourth graders across all three conditions, which was predicted and not surprising given dominant theories of cognitive development (Rogoff, 2003). However, our prediction that both fourth and sixth graders' highest performance would be in the movement expression learning condition was not supported. The significant interaction between grade level and learning condition is quite noteworthy and revealed greater story recall in the HMSYN learning condition for fourth graders and greater story recall in the LMNSYN learning condition for sixth graders.

Examining developmental and social processes may help account for why older African American children in this study appeared less responsive to the HMSYN learning condition. As a child develops and routinely participates in a traditional schooling context over time, it could be argued that there is a necessity to suppress Afro-cultural practices and behavioral repertoires deemed liabilities (Boykin, Miller, et al., 2005). Thus, older African American school children attempt to accommodate mainstream schooling practices such as individualism, competition, and movement restriction. Anecdotal evidence suggests that younger African American children do in fact exhibit more movement and expressive behavior inside and outside the classroom in comparison to older African American children (J. M. Cole, 2000).

Another possible explanation for sixth graders' performance is the influence of peers. Peer perceptions during middle childhood and early adolescence become significantly important and shape socially acceptable behaviors of the child (M. Cole, Cole, & Lightfoot, 2005). It is plausible many of the sixth grade children feared potential embarrassment and questioned whether their friends thought it was acceptable for them to fully participate in the HMSYN condition, which required them to move their bodies to the beat of the music and dance around while listening to a story. Despite their enjoyment of it, the HMSYN may have interfered with social norms, and the LMNSYN may have been perceived as an acceptable compromise, resulting in enhanced story recall performance. It is important to note that our results in Experiment 2 showed substandard story recall for both fourth grade and sixth grade children in the control learning condition, which closely mirrors traditional schooling, absent of any music or movement.

Our results across Experiment 1 and Experiment 2 provide support for the importance of mood and motivation mediating learning. Our specific prediction was confirmed, and we obtained a significant positive correlation between story recall performance and children's mood state. In fact, the results indicated that children who participated and performed well in the movement expression learning condition reported more engagement and positive affect. The opposite held true for the control condition, in

which our findings showed poor performance associated with more negative affect and less engagement. It is interesting that for the sixth graders this positive correlation between story recall performance and mood was significant even in learning conditions predicted to be less culturally congruent. These findings have continuity with the previous studies examining the relationship between mood and cognition (Isen, 2000).

Although the present study confirms movement expression as a facilitator of learning in important ways, there are limitations. First, we employed a convenience sampling technique. We sampled only from schools with principals who were interested in or familiar with the literature on culturally congruent learning environments. Moreover, we relied on the return of parent permission slips, which limited the size and may have biased the sample. Future research may want to repeat this study with a teacher during actual classroom time and not as a student "pull-out" experiment. By doing so, it will increase sample size and move toward real classroom practices. In addition, this study examined only the impact of different types of music-linked movement on story recall tasks. In order to generalize these findings to actual classrooms, other reading activities and academic domains must be explored, such as mathematics and science.

It would possibly be fruitful if a longitudinal design with multiple trials were employed in order to scrutinize the potency effects of culturally structured learning environments. This study examined developmental differences between fourth and sixth grade children. One may argue that sixth grade children would have probably responded differently to the HMSYN condition if opportunity to "refamiliarize" to that form of learning were presented. Moreover, future research would benefit from a longitudinal study to examine if dramatic differences would exist among a fifth grade sample. Hence, future research should consider what developmental trends exist across all school grade levels (kindergarten through sixth grade).

Finally, future research should investigate the impact of movement expression as a facilitator of classroom learning with children from multi-ethnic groups, especially Latinos, who represent an even larger group of children struggling academically. If we desire to adequately address the problem of low academic achievement for poor children, researchers must continue to study the culturally diverse practices in households and communities that can be strategic resources to mediate schooling practices and classroom learning. We need to expand the generalizability of our findings and more fully understand the processes that make learning conditions with music-linked movement work better for some students than for others (Allen & Boykin, 1992). Taken together, this work lends credence to the centrality of cultural assets in the enhancement of learning for African American children.

## APPENDIX

Learning Condition	Script
HMSYN	“We are studying the way children learn and remember things, and one way children learn and remember is with music. So I am going to read you a story with music and I want you to <i>move your body to the beat of the music</i> . Feel free to <i>snap your fingers, dance, and clap, bob your head, and express yourselves</i> . Pay close attention because after this activity there will be some questions to answer about the story. Okay, let us begin.”
LMSYN	“We are studying the way children learn and remember things, and one way children learn and remember is with music. So I am going to read you a story <i>rhythmically</i> with music. I want you to <i>sit still</i> and listen to the story. Pay close attention because after this activity there will be some questions to answer about the story. Okay, let us begin.”
HMNSYN	“We are studying the way children learn and remember things, and one way children learn and remember is with music. So I am going to read you a story with music. Feel free to <i>sway your body to the music</i> . Make sure that you are listening to the story because after this activity there will be some question to answer from the story. Okay, let us begin.”
LMNSYN	“We are studying the way children learn and remember things, and one way children learn and remember is with music. So I am going to read you a story with music. I want you to <i>sit still and listen</i> to the story. Pay close attention because after this activity there will be some questions to answer about the story. Okay, let us begin.”

NOTE: HMSYN = high movement and syncopated music; LMSYN = low movement and syncopated music; HMNSYN = high movement and nonsyncopated music; LMNSYN = low movement and nonsyncopated music.

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