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BOOK REVIEW

Hip-Hop and Mathematics: A Critical Review of *Schooling Hip-Hop: Expanding Hip-Hop Based Education Across the Curriculum*[1]

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> Early HHBE [Hip-Hop Based Education] practices have taken place most often in language arts and English education classrooms because of rap music's clear and intuitive connections to the written, spoken, and poetic word. However, researchers and practitioners must forge meaningful connections to other disciplines, including those (like math and science) that are alleged to be culturally neutral. (Hill & Petchauer, 2013, p. 3)

There has been a call for researchers and practitioners to use hip-hop based education (HHBE) practices in mathematics education (Hill & Petchauer, 2013). In the edited book *Schooling Hip-Hop: Expanding Hip-Hop Based Education Across the Curriculum*, Hill and Petchauer contend that extant HHBE literature has produced a clear and persuasive reason to use HHBE practices in educational settings. Hill and Petchauer assemble eight chapters from new and veteran HHBE scholars in the United States and abroad to expand the use of hip-hop beyond English into other disciplines, specifically, and the use of hip-hop based ed-

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ucational practices, generally. While rap[2] is the main HHBE strategy used by researchers and practitioners, Hill and Petchauer call for the use of other dimensions of hip-hop "such as DJing or turntablism, b-boying/b-girling, graffiti writing and visual art, fashion, language, or spoken-word poetry" (p. 2). Nevertheless, the editors do not offer a definition of HHBE that serves as a unifying thread throughout the book. Hill and Petchauer (2013) note, "the overwhelming majority of HHBE scholarship has failed to broaden the bounds of possibility for theorizing, researching, or implementing hip-hop based educational practices" (p. 2). The contributors to this edited volume seek to provide guidance in helping to broaden the possibilities of HHBE into other disciplines. In this review, we discuss the possibilities of this work in urban mathematics education for African American students.

Organization of the Book

The volume is divided into two sections of four chapters that are intended to expand HHBE into new intellectual directions. Part I: Aesthetics, Worldviews, and Pedagogies of Hip-Hop addresses the intersection between hip-hop and educational practice in a range of disciplines and settings. In Chapter 1, Emdin (2013) asserts to go beyond rap text to focus on incorporating the rap cypher[3] battle rapping,[4] and what he calls *reality pedagogy* in science education. In Chapter 2, Petchauer (2013) focuses on justice-oriented teaching and democratic curriculum through the hip-hop aesthetics of kinetic consumption and autonomy/distance with African American pre-service teachers. In Chapter 3, Peterson (2013) continues the focus on college students in an undergraduate hip-hop based composition course. He focuses on the hip-hop aesthetics of sampling, freestyling, and remixing to design a pedagogical and theoretical foundation for the composition course. In Chapter 4, Wilson (2013) focuses on southern hip-hop, higher education, and historically Black institutions using the HipHop2020 Curriculum Project

[2] *Rap* is just one of the elements of hip-hop. Hip-Hop refers to art forms and street influence that consist of 11 elements: (a) rapping, (b) singing, (b) b-boying/b-girling, (d) djaying, (e) graffiti, (f) beatboxin, (g) street fashion, (h) street language, (i) street knowledge, and (j) street entrepreneurialism (KRS-One as cited in Bridges, 2011; also see Chang, 2005; Jeffries, 2011). Hip-Hop also refers to how a person acts, walks, dresses, looks, and talks; in this context; it is both an art form and lifestyle. We do not refer to hip-hop as a culture.

[3] A rap cypher involves people getting together in a circle taking turns freestyling, rapping prewritten or pre-thought-out rhymes.

[4] A rap battle or battle rapping involves two people rapping against one another in front of an audience who determines the rapper with the best lyrical content and flow.

(see http://fourfourbeatproject.org/hiphop2020/) to promote leadership development of college students.

Part II: Curricula, Courses, and Pedagogies with Hip-Hop explore HHBE programs and their complexities. In Chapter 5, Irby and Hall (2013) focus on HHBE professional development provided to practicing teachers interested in using hip-hop in diverse schooling contexts. Chapter 6 focuses on two hip-hop based afterschool programs for youth in Montreal, Canada where Low, Tan, and Celemencki (2013) advocate for teachers to use rap as text and creative practice to conceptualize it as an aesthetic, cultural, and imaginative production. International perspectives of HHBE continue in Chapter 7 with Pardue (2013) who examines the use of hip-hip as a political project in São Paulo, Brazil with youth from poor, working class backgrounds to learn about what it means to be Brazilian. The book concludes by returning HHBE to the United States in chapter 8 where Stovall (2013) describes a social studies college bridge course that examines the current wave of gentrification and urban renewal in Chicago.

Hip-Hop Based Education in Science Education

In order to forge meaningful connections between mathematics education and HHBE, mathematics educators will have to cross disciplinary boundaries to evaluate HHBE as an appropriate tool for the field. We would like to take it a step further by questioning whether HHBE is appropriate for African American students learning mathematics in urban schools. The use of hip-hop in classrooms was largely intended to reach African American students in urban schools (Irby & Hall, 2013). As no chapters in this book address mathematics education directly, we choose to focus a larger part of our review on Emdin's (2013) chapter on using hip-hop based educational practices in science education, the affiliate to mathematics education. We pay close attention to Low and colleagues (2013) and Stovall's (2013) chapters where the focus is on youth, using them to draw parallels to work being done in mathematics education and to glean insight into HHBE for African American youth in mathematics education. We also focus on Petchauer (2013) and Irby and Hall's (2013) chapters where the focus is on pre-service and in-service teachers' use of HHBE to think critically about how pre- and in-service mathematics teachers might use hip-hop based educational practices.

Emdin (2013) argues that culturally relevant approaches that do not consider hip-hop culture are most often ineffective approaches to teaching urban youth. He asserts that culturally relevant pedagogy (see, e.g., Ladson-Billings, 1994) is ineffective when theorists and teachers do not consider that urban youth are deeply immersed in hip-hop culture. Emdin argues further that misidentifying "hip-hop as just a musical genre and not a culture, limits research and practice in urban schools from moving beyond the dead, mechanical, and formal approach to in-

struction that is prevalent in urban schools" (p. 12). In response to these approaches, Emdin advocates for five main concepts/steps (The 5 C's) that teachers should use to engage in HHBE. The 5 C's comprise what he calls *reality pedagogy*.

The 5 C's of reality pedagogy include: (a) cogenerative dialogues, (b) coteaching, (c) cosmopolitanism, (d) context incorporation, and (e) content development (Emdin, 2013). Cogenerative dialogues are "structured dialogues in which the teacher and four to six students discuss the science classroom" (p. 20). He argues that these discussions should be structured like a rap cypher where participants form a circle, have equal turns to speak, and support one another in their roles. Emdin views co-teaching as a hip-hop performance where the artists prepare for a performance. In his view, the student should take on traditional teacher roles such as planning and implementing a lesson. Cosmopolitanism is a philosophical principle that, Emdin contends, is a part of hip-hop, and is based on the idea that all students are responsible for each other. He purports that teachers need to see how hip-hop youth exhibit cosmopolitanism in their lives as a means to bring function into the classroom. Context incorporation involves teaching practices that use analogy and simile as a strategy similar to what rap artists use in their lyrics. Additionally, context integration supports bringing items from students' communities into the classroom and connecting the items to hip-hop and science. The last C, content development, involves teachers being willing to admit they do not always have all the information and to share with students how they acquire new knowledge. Emdin's reality pedagogy offers useful suggestions for involving youth in science classrooms and getting them to take responsibility for one another.

From Emdin's (2013) perspective, cogenerative dialogues, rap cyphers, and rap battles are designed for urban youth to engage in science talk that results in a better understanding of science content. His explanation of how to use rap cyphers and battles appears to fall short of demonstrating how urban youth gain in-depth knowledge of science content. It is also unclear whether cogenerative dialogues are about science content or the science classroom. In one part of the chapter, Emdin writes about science content with cogenerative dialogues while in other places he writes about students offering suggestions for improving the class and being able to showcase their perspective on any classroom situation. He views hip-hop as a key component to actively engaging students in science classrooms, helping students in urban areas learn science, and making science culturally relevant to them. Emdin's use of culturally relevant pedagogy appears to focus on using hip-hop to help students achieve academic success and cultural competence of hip-hop culture. He does not discuss or describe how to develop urban youth's critical consciousness.

Developing the Critical Consciousness of African American Students in Urban Areas

Critical consciousness is an essential component of culturally relevant pedagogy (Ladson-Billings, 1994) that Emdin's (2013) reality pedagogy fails to address. Culturally relevant pedagogy advocates for African American youth to develop critical consciousness of racism, classism, and other forms of oppression as a means to improve their lived realities (Ladson-Billings, 1994). Emdin's reality pedagogy falls short of raising students' critical consciousness and changing the conditions of their communities or lived realities in urban areas. However, Stovall (2013) engages youth in raising their consciousness in Chicago at Lawndale/Little Village School for Social Justice (SOJO) in a social studies unit entitled "Hip-Hop, Urban Renewal, and Gentrification." Urban renewal and gentrification are important issues in urban communities throughout the nation. Stovall makes connections between gentrification and urban renewal in Chicago and New York City using reports, hip-hop, social studies texts, and rap lyrics.

Stovall's (2013) urban renewal unit was relevant to his students because their neighborhood was experiencing the effects of massive gentrification. Stovall describes how he collaborated with Eric (Rico) Gutstein (a colleague at the University of Illinois at Chicago who also works with SOJO) and SOJO faculty and students to develop curricula and lessons in mathematics and social studies. Gutstein (see, e.g., 2013) teaches mathematics for social justice and he has also taken up the issue of gentrification in mathematics as a means of helping students to develop sociopolitical awareness and to see themselves as change agents in their community and society. His work also draws heavily on Ladson-Billings' (1994) notion of culturally relevant pedagogy, more specifically, helping students to develop critical consciousness to take action to change their lived realities. Without addressing critical consciousness, Emdin's notion of using rap cyphers or rap battles as part of his reality pedagogy is no different from teachers who simply rap or use rap text or rap videos in the classroom without any critical examination of rap music, the artist lifestyle, or the communities they rap about.

Low and colleagues (2013) draw attention to critical rap/hip-hop consciousness and pedagogies to prepare youth to critically think about the world and to deal with their investment in some of the most oppressive representations of hip-hop. The authors address the tensions with hip-hop culture's depiction of violence, misogyny, race, and materialism, and how these issues impact the schooling of youth. These scholars assert that HHBE scholars and practitioners have been so focused on working to legitimize hip-hop based educational practices in schools that they either have ignored or disparaged the ways youth engage in oppressive elements of hip-hop culture. Low and colleagues focus specifically on how racialized minority youth construct identities connected to hip-hop and how

these identities are constantly being constructed and reconstructed in relation to other cultures, communities, and affiliations. On the one hand, Low and colleagues emphasize that they are "wary of reifying notions of 'hip-hop identities'" (p. 119), a concern that we share, especially as it relates to African American youth in urban communities and schools learning mathematics. On the other hand, however, Emdin's (2013) focus on hip-hop appears to advocate for urban youth to adopt hip-hop identities without question. Emdin essentializes all urban youth as being immersed in hip-hop culture, identifying with hip-hop culture, and wanting to be taught using hip-hop. Conversely, Shockley (in press) argues that having African American students develop hip-hop identities and refer to hip-hop as a culture creates identity confusion and interferes with them developing healthy cultural identities connected to African culture. In mathematics education, Martin (2007) argues that educators must assume responsibility for helping African American students to develop healthy racial, academic, and mathematics identities. These identities have played a major role in helping African American students achieve at high levels in mathematics (Berry, 2003; Berry & McClain, 2009; Stinson, 2004; Thompson & Davis, 2013).

Teachers Use of Hip-Hop Based Education

Hill and Petchauer (2013) suggest that HHBE is intended for pre- and in-service teachers, but little is known about the lives of these teachers. In the United States, most pre- and in-service teachers are White and many of them possess very little knowledge of hip-hop music or hip-hop based educational practices (Irby & Hall, 2013). Petchauer's (2013) chapter focuses on African American pre-service teachers; however, it does not provide insight into how these teachers used HHBE practices because they did not implement the practices with actual students in a classroom. Irby and Hall (2013) provide insight into how practicing teachers use HHBE. They contend that most research on HHBE focuses on teacher-researchers in urban areas who elect to document their educational practice and little research has been conducted on non-researching K–12 practitioners interested in using HHBE without publishing their work in scholarly journals. The authors report findings of 63 non-researching veteran and novice teachers in Philadelphia who attended one or more of four professional development workshops that focused on HHBE practices. The findings suggest that it is important to understand: (a) teacher identity, (b) the perspectives of teachers who do not identify with hip-hop, and (c) the diversity of K–12 practicing teachers interested in using HHBE practices because their perspectives are not reflected in the extant research literature.

In Irby and Hall's (2013) study, the majority of the teachers (51%) taught in Philadelphia, but only nine of these teachers taught in Philadelphia Public

Schools; most of the participants (74%) taught in private or public charter schools in urban areas. The majority of the teachers were elementary and middle school teachers (80%) with fewer being secondary school teachers (9%), and a population of teachers (11%) that did not work with a specific grade level or with K–12 students. Most of the teachers (60%) lived in the surrounding suburban or rural areas of Philadelphia and commuted to teach in the city's schools. Only 40% of the teachers lived in Philadelphia. Irby and Hall found that non-researching teachers interested in using hip-hop lacked knowledge of hip-hop and their motives for using HHBE were not "situated in the theoretical and practical objectives of critical and culturally relevant pedagogies" (p. 112).

In our review of the mathematics education literature, it appears that, as Irby and Hall (2013) report, HHBE practices that have been used by practicing teachers are not being published in scholarly journals. Similar to the book editors, we were unable to find HHBE journal articles published by mathematics educators. Our search for insight into how mathematics educators use HHBE practices led us to several web-based sources where mathematics teachers and students were using rap and rap videos to memorize formulas, to learn mathematical facts, to improve vocabulary, and to increase test scores. Hill and Petchauer (2013) caution against such "rappin teachers" who rap or use recorded raps to promote memorization of facts as they advocate for a deeper understanding of hip-hop aesthetics and epistemology and how they are connected to students' lives and specific content area practices (e.g., science, mathematics). However, most practicing teachers (including mathematics teachers) who use hip-hop based educational practices in classrooms do not situate their work in critical and/or culturally relevant pedagogies (Irby & Hall, 2013).

HHBE and the Mathematics Education of African American Students: Important Considerations

The use of HHBE for African American students in mathematics education should be approached from five areas of caution. First, there is an agenda being advanced in mathematics education to conduct liberatory research and to provide African American students with a liberatory mathematics education (Martin, 2009a; Martin & McGee, 2009). In Martin's (2009a) edited volume *Mathematics Teaching, Learning and Liberation in the Lives of Black Children*, he assembled mathematics educators of African descent and others who are committed to providing African American children with a meaningful mathematics education to "change the direction of research on Black children and mathematics" (p. vi) with a focus on the theme of liberation. Simply rapping, using rap text, or sharing rap videos in mathematics classrooms without any critical examination of rap music, the artist lifestyle, or the communities they rap about is not liberatory. Martin and

McGee argue, "any relevant framing of mathematics education for African Americans must address both the historical oppression that they have faced and the social realities that they continue to face in contemporary times" (p. 210). We support and advocate for scholarship and pedagogy that produce liberatory outcomes for African American youth. Jett's (2009) review of Martin's (2009a) book echoes our sentiments about advancing liberatory mathematics scholarship and pedagogy. We ask: Where does providing African American students with a liberatory mathematics education fit into the current research and pedagogical approaches being advanced in HHBE?

Second, the theoretical underpinnings of hip-hop pedagogy remain undertheorized (Hill, 2009). The same is true for HHBE in K–12 settings. The underdevelopment of HHBE theoretically contributes to practitioners' lack of understanding of what does and does not constitute HHBE practices. For most mathematics practitioners, it appears that the use of rap music or videos constitutes hip-hop pedagogy. Most iterations of HHBE claim to draw on critical pedagogy and culturally relevant pedagogy (Emdin, 2013; Hill, 2009; Irby & Hall, 2013). However, most practicing teachers who use HHBE in their classrooms do not appear to develop African American students' critical consciousness or prepare them to take action or to change their lived realities, which are all key components of critical pedagogy and culturally relevant pedagogy. We ask: What are the key tenets of HHBE that should guide teachers in general and mathematics teachers in particular to achieve liberatory outcomes?

Third, there is a push to develop African American students' racial, cultural, and mathematics identities (Berry & McClain, 2009; Martin, 2007; Thompson & Davis, 2013). Scholarly literature in mathematics education indicates that racial and mathematics identity development is important for Black students to determine what it means to be a Black mathematics learner (Berry & McClain, 2009). While the development of Black students' racial identity is important, we think that it is important to distinguish between racial and cultural identities. Thompson and Davis (2013) argue that there is a difference between racial and cultural identity development among African American students in mathematics settings. To these scholars, racial identity development pertains to the ways social constructions of race shape Black students' racial identity development whereas cultural identity pertains to African American students' developing ethnic identities that connect them to their cultural heritage in Africa.

Here, we are concerned about how the cultivation of hip-hop identities will impact the current line of scholarship devoted to positively developing African American students' racial, cultural, and mathematics identities. HHBE studies have shown that African American students are developing hip-hop identities that often run counter (Low et al., 2013) to them developing healthy cultural identities of what it means to be a person of African descent (Davis, in press; Murrell,

2002). Both Davis (in-press) and Murrell (2002) argue that African American youth must develop healthy cultural identities connected to the traditions, history, and heritage of people of African descent. As a mathematics education community, we have to decide if consciously promoting the development of hip-hop identities will interfere with African American students developing healthy racial, cultural, and mathematics identities. In our view, advocating for the development of hip-hop identities is not aligned with current efforts to promote the development of healthy positive identities in mathematics education. However, we think that mathematics educators will have to determine how to address African American students' development of hip-hop identities because many of them are consciously and/or unconsciously developing these identities.

Fourth, there has been a push to understand how social constructions of race, racism, and other forms of oppression impact African American students' mathematical experiences and lived realities (see, e.g., Martin, 2009a, 2009b, 2009c). Martin's (2009b) *Teachers College Record* article sparked much conversation in mathematics education about race and racism that had been silenced. He examined the ways that race and racism are conceptualized in society and how these social constructions of race and racism inform mathematics education researchers, policymakers, and practitioners. Martin called for researchers, policymakers, and practitioners to examine how social constructions of race and racism shape the mathematics education landscape. We ask: Where does HHBE stand on addressing social constructions of race, racism, and other forms of oppression that are prevalent in the lives, schooling, and mathematics education of African American students? Many scholars suggest that hip-hop addresses issues of race, racism, and other forms of oppression in urban communities and society (Hill & Petchauer, 2013). If this is the case, addressing issues of race, racism, and other forms of oppression should be a salient feature of HHBE. Those concerned with African American children's well-being must act with a sense of urgency to address issues of race, racism, and other forms of oppression because African American students' lives are at stake (Martin, 2009c).

Lastly, there has been a paradigm shift in mathematics education to focus on successful or high-achieving African American students. The following factors have been found to contribute to African American students' high achievement and persistence in mathematics: (a) early opportunities to learn mathematics; (b) parental, guardian, and extended family support and advocacy; (c) advanced mathematics courses and programs; (d) teacher and peer support and encouragement; (e) involvement in extracurricular activities; and (f) spiritual beliefs (Berry, 2003; Ellington, 2006; Stinson, 2004). There is a clear line of scholarly research focused on African American students' success and high-achievement as opposed to a narrow focus on their failures. Thompson and Davis (2013) argue that research on high-achieving African American students in mathematics must shift

from a focus on individual mathematics achievement to a focus on collective mathematics achievement. They also argue that there has to be collective responsibility for ensuring both "high-" and "low-performing" African American students have an opportunity to achieve in mathematics. We ask: How does HHBE promote high achievement in African American students that can complement or advance efforts in mathematics education? The authors of this edited book suggest that HHBE scholars and the current HHBE literature have made a clear and persuasive argument to use HHBE practices and to expand the practices into in mathematics education. As it stands, we are yet convinced that HHBE practices in mathematics education should be used to teach African American students mathematics in urban schools as the authors of this edited book suggest.

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