

# Learning from *The College Dropout*: Depictions of Numeracy and Mathematics within Hip Hop Music

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*This study analyzed popular Hip Hop music albums (n=6) presenting narratives about Hip Hop musicians achieving success, so as to determine if the messages disseminated in the albums supported or refuted the heuristic notion that teachers and parents tell children: “You need math skills to get a good job.” Selected albums were analyzed, and each was coded for references to mathematics (including numeracy, numbers, or statistics); then coded data was tabulated to determine any patterns in support or refutation of the importance of mathematical skills and abilities to succeed in a Hip Hop career according to the narratives presented within these albums. The discussion and conclusions sections of this paper then examines the consequences of these findings in terms of developing programs and pedagogy that positively impacts minority adolescents’ perceptions of mathematics, and their attitudes toward mathematics-related careers such as the STEM (science, technology, engineering, and mathematics) fields.*

**Key Words:** Minorities and mathematics, Hip Hop music and culture, language of schooling, E-E (entertainment-education, edutainment).

The *Process Standards* created by NCTM (2000) specify the need for maintaining high-quality communication and representation of mathematical ideas in order for students to learn mathematics. Establishing healthy lines of communication often involves the deliberate coordination of multiple representations, showing and demonstrating the same mathematical concepts from different perspectives (National Council of Teachers of Mathematics [NCTM], 2000). An important component in many of the successful efforts aimed at decreasing mental distances between teachers and their students has been having the teachers learn about their students’ interests and culture, and then incorporating those themes into the lessons taught (Gorham & Zakahi, 1990). Instructional technologies that enable playback and control of media and multimedia, when properly supported and contextualized within the classroom, have been shown to provide students with opportunities to become engaged with learning mathematical ideas while examining physical and social phenomena (An, Zhang, Flores, Chapman, Tillman, & Serna, 2015). Music is a particularly influential popular media, and the narratives contained

within musical lyrics can provide content for facilitating discussions between students and their peers, as well as students and their teachers (Horn, 2003).

### Conceptual Framework

Because of the sometimes unsuitable lyrics, music that is appropriate for the classroom must be selected carefully. As an illustration of the positive use of music, the role of Hip Hop within science and mathematics education has been examined by scholar Christopher Emdin. His research has determined that *HipHopEd* occurs anytime that classroom educators employ activities incorporating aspects of Hip Hop culture, including the use of student-generated rap lyrics as text (Emdin, 2010). Within such a context, formats such as rap battles between competitors have been used in an academic context to make learning more engaging. Emdin believes that including Hip Hop in education is an innovative as well as scalable teaching method, and he has labeled his own brand Reality Pedagogy (RP). An overriding theme of RP is the emphasis placed on teachers gaining empathy for their students' concerns and interests, so that instruction can commence from a meaningful starting point (Emdin, 2016).

Continuing Emdin's line of research, the HipHop2020 Curriculum Project (<http://fourfourbeatproject.org/hiphop2020>) was founded by Joycelyn Wilson, a scholar of Hip Hop pedagogy and former high school math teacher, with the aim of developing the academic success and leadership capacities of African American youth and those that influence them (2011, 2013). Wilson refers to the utilization of Hip Hop-inspired mathematics education as a form of Authentic Leadership Pedagogy that uses narratives from movies, lyrics, books and other products of Hip Hop culture, as a medium for offering contemporary lessons that are contextualized within topics that students find engaging (2013). Within this context, and as an extension of this line of research, the current study was designed to analyze a sample of popular Hip Hop music albums ( $n=6$ ) presenting narratives about Hip Hop musicians achieving success, so as to determine if the messages disseminated in the albums supported or refuted the heuristic notion that teachers and parents tell children: "You need math skills to get a good job." Selected albums were analyzed, and each was coded for references to mathematics, including numeracy, numbers, or statistics. Then the coded data was tabulated and analyzed to determine any patterns in support or refutation of the importance of mathematical skills and abilities to succeed in a Hip Hop career, according to the narratives presented within these albums. This study was undertaken as part of a larger line of inquiry, which collectively aims to facilitate the further developing of programs and pedagogy that positively impacts minority adolescents' perceptions of mathematics, and their attitudes toward the STEM fields.

## Research Purpose and Questions

As demonstrated by historical music genres as diverse as folk-rock, punk-rock, do-wop, and be-bop, the songs and lyrics that youth enjoy are rarely aligned with the aesthetic and cultural values of their parents and teachers, and in fact often serve to subvert or even replace the previous generation's values (Tillman, Wilson, Zhang, Camsat, Galindo, & An, 2015). Emdin's Reality Pedagogy, and the other related teaching theories and methods, provide a roadmap for bringing Hip Hop culture and products into the classroom in a way that supports effective pedagogy. For educators that wish to undertake such a process, Emdin recommends focusing on the Seven Cs that he believes are essential to high-quality Reality Pedagogy. These Cs, which are meant as practical tools that any educator can use in their own classroom, are: (1) Cogenerative dialogues—during which teachers and students discuss instruction, and both suggest ways to improve it; (2) Coteaching—during which students learn content and then teach the whole class; (3) Cosmopolitanism—during which students play a role in determining what is taught as well as how it is taught; (4) Context—during which the school's local neighborhood and wider community are included as part of the classroom; (5) Content—during which the teacher proactively acknowledges their own limitations regarding content knowledge, and actively works alongside the students to build expertise; (6) Competition—during which opportunities are presented for students to showcase what they have learned; and (7) Curation—during which artifacts are collected and employed to support the other Cs (Emdin, 2010, 2016; Wilson, 2013).

Educational programs that have incorporated the seven Cs include Sam Seidel's *Hip Hop Genius: Remixing High School Education*. Seidel's curriculum is intended to help students identify intersections where their cultural values overlap with their academic and career goals. Another popular example is *Flocabulary*, which is an online service used by over 35,000 schools according to the company's website, and that provides mathematics education videos with a Hip Hop theme, along with corresponding interactive activities and online assessments for use by students in grades K-12. Likewise, "Mr. G & The Kiddie Crunk Crew" have created a collection of songs, music videos, and games that provide students with new ways of learning using Hip Hop culture as a context. Another example of Reality Pedagogy is the *Funkamentalz* curriculum developed by Kennedy and Colwell, which uses rap music to teach mathematics and other STEM subjects. Alex Kajitani, aka "Duey the Rappin' Mathematician," is another educator working in this realm, as the rapper-turned-educator uses Hip Hop as a context for middle school algebra lessons. Another group, termed DobleFlo, are a rap duo that uses math topics as lyrics, and provides corresponding music-themed algebra challenges.

Nevertheless, despite these interesting and helpful education-themed examples, the vast majority of Hip Hop productions—like most music—were not created with the classroom in mind, and in fact the themes of the lyrics are sometimes adamantly against formal education. A previous study about Hip Hop themed movies determined that all eight of the movies selected displayed a primary protagonist with a value-system that rejected pursuing a more typical career, as well as the schooling necessary for such a job (Tillman et al., 2015). Each of the eight movies analyzed (four of which were fictional reenactments, and four of which were documentaries) presented a language of schooling narrative emphasizing self-instruction gained outside of institutionalized education. All eight of the movies featured artists that were primarily auto-didactic while learning their musical craft and developing their career. As an illustration of this consistent phenomenon, *Time is Illmatic* tells the story of Nasir Jones's rise to fame as a rapper, and is narratively centered around his rejection of formal schooling in favor of self-instruction, as well as his father's support of this decision. Similar to *Time is Illmatic*, each of the movies analyzed exhibited a narrative wherein the protagonist's rejection of formal education was an almost de facto requirement before succeeding in the Hip Hop genre.

Yet despite their lack of respect for formal education, the protagonists portrayed in these movies were generally shown to succeed as a result of their ability to out-strategize the competition, both musically and professionally—and not because they resorted to violence or other illegal means. The theme presented in the movies analyzed was that success in Hip Hop music requires quick wits and the ability to think faster than others, but referential mathematics abilities beyond basic arithmetic are not necessarily required. Any mathematics beyond that, the movies narratively argued, can be outsourced to employees once you have money, as portrayed in the movie *Hustle & Flow* when Skinny Black speaks about his team of “number crunchers.” Aside from such occasional dismissive references, mentions of the Hip Hop protagonists or other characters being capable at mathematics were almost non-existent, and most references to numbers as numbers *per se* (i.e., referential and not symbolic) were generally static or durational time references, such as references to deadlines or meeting periods.

Based upon the results from this previous study about Hip Hop themed movies, the current study was designed and undertaken, so as to further facilitate the development of programs and pedagogy that positively impacts minority adolescents' perceptions of mathematics, and their attitudes toward mathematics-related careers such as the STEM fields. The principal quantitative research question to be addressed in this current research study was: What is the nature of the depictions of numeracy and mathematics within popular Hip Hop music albums? The principal qualitative research question to be addressed in this study was: What lessons and implications for mathematics education can be garnered from an examination of an especially

successful exemplar of the Hip Hop genre?

### Research Methods

This study assessed Kanye West's (2004) popular and award winning Hip Hop music album *The College Dropout*—which was selected because it presented a narrative about the artist's experience with college and subsequent decision to dropout before graduation—along with the five previous Grammy winners for *Best Rap Album*. The six albums were assessed in regards to depictions of numeracy and mathematics within popular Hip Hop music. During analysis, the lyrical content of the album was coded for references to numeracy (including mathematics, numbers, or statistics); then coded data was tabulated to determine any patterns in the presentation of representational mathematics (i.e., actual mathematics) versus symbolic mathematics (i.e., using numbers as slang, nicknames, and such). After the quantitative data analysis of all six albums was complete, a qualitative content-analysis of the themes and messages from *The College Dropout* was performed. The quantitative findings were then employed to address the first research question posed, and the qualitative findings were used to address the second research question.

### Data Resources

In addition to a content analysis of *The College Dropout*, this study also analyzed and compared results from the five previous Grammy winning albums in the category of *Best Rap Album*, which included: (1) *The Slim Shady LP*, by Eminem, released in 1999, Best Rap Album of 2000; (2) *The Marshall Mathers LP*, by Eminem, released in 2000, Best Rap Album of 2001; (3) *Stankonia*, by OutKast, released in 2000, Best Rap Album of 2002; (4) *The Eminem Show*, by Eminem, released in 2002, Best Rap Album of 2003; and (5) *Speakerboxx/The Love Below*, by OutKast, released in 2003, Best Rap Album of 2004. Additionally, relevant interview quotes (cited from Hip Hop themed magazines and documentaries) wherein the artists' speak about their creative motivations and processes were included so as to provide supplementary insight furthering the analysis.

The media productions chosen for this case study was selected for having met the primary criteria that the production was a blockbuster—defined here as being both highly commercially profitable as well as critically acclaimed. In addition to the quantitative analysis, the case that was chosen for the qualitative content-analysis was selected because of the educational theme of the lyrics and album as a whole. Specifically, the 2004 debut album *The College Dropout* created by Atlanta-born and Chicago-raised hip-hop artist Kanye West, and produced by Roc-A-Fella Records, was selected for analysis. After the release of the album in early 2004, awards for the album would eventually include ten Grammy nominations in 2005—including a

nomination for *Album of the Year*, winner of the *Best Rap Album* category, and winner for *Best Rap Song* (Grammy.com, 2013). Across all genres, *The College Dropout* was voted best album of the year by both *Rolling Stone* and *Spin* magazine; further, in 2006, *Time* magazine named *The College Dropout* as one of the 100 best albums ever made, and in 2008 *Entertainment Weekly* named it the best album of the decade (Wang, 2013). The overall theme of *The College Dropout* focused on a narrative describing the motivations behind musician Kanye West's decision to attend college and then withdraw, but despite having a title that focused on the option to "dropout", the album was actually a complex narrative vividly articulating the multi-layered motivations underlying the artist's decision. Specifically, West's debut music album presented an innovative message formulation on the topic of his decision about whether to remain in college or withdraw, along with prosocial messages about the educational experiences of other young black men and women living in impoverished urban areas.

### **Data Collection and Analysis**

The data collection and analysis method employed during this study was designed to investigate and interpret the content and context of *The College Dropout* media production as well as previous Grammy winners of *Best Rap Album* in terms of the depictions presented of numeracy and mathematics within popular Hip Hop music. During the data collection, each record was listened to, while simultaneously reading the lyrics (either from the artists' own websites, or from online lyrics resources such as Azlyrics.com and Genius.com). Numerical references were then catalogued for each song, and then per album. During coding, each verse had its dedicated line; in case a specific verse spread over multiple lines, or needed the inclusion of other lines for context, these lines were included, and separated by a double slash (//). In this context, numeracy references were understood as a strictly empirical criterion and thus all mentions of mathematics, numbers, or statistics, were recorded. Ordinal instances (first, second, etc.) were not recorded, except in the instance of school grades. The coded data was then sorted according to salient themes inspired by previous studies (primarily: Tillman, Wilson, Zhang, Camsat, Galindo, & An, 2015), but also confirmed in the present data collection as major themes of Hip Hop music (Lincoln & Guba, 1985). The data was then tabulated in a spreadsheet table, and each of the occurrences of the different themes were compiled by album. After the quantitative analysis, an in-depth qualitative analysis of the content and context of *The College Dropout* was then performed so as to garner further insights relevant to the research questions.

## Results

The following quantitative results section presents findings from an examination of numeracy references (i.e. discussion of mathematics, numbers, or statistics) within Hip Hop records released between 1999 and 2004, with each year's Grammy winner for *Best Rap Album* selected for analysis. The purpose of the analysis was to assess the value of numeracy and mathematics education within the context of popular Hip Hop culture, and determine how numeracy and mathematics education are portrayed within this genre. The six albums analyzed below all achieved the dual criteria of both commercial and critical success at the time of their release, and because each earned *Best Rap Album* Grammys in their respective year, they are fitting representatives of mainstream Hip Hop sensibility and culture during those respective years. In some sections of the analysis, the five albums that won *Best Rap Album* prior to *The College Dropout* will be employed to highlight specific thematic concerns addressing this paper's research questions. After the quantitative findings have been discussed, the paper will then transition to a discussion of the qualitative findings.

### Quantitative Findings

The quantitative findings section below first presents a brief description for each of the numerical-themed data types that were coded. Next there is a discussion of the distribution of the coded numerical data types. Then there is an analysis of the numerical references, regarding whether they are numerical per se, or whether they are symbolic. Finally, the symbolic references were separated into the three subthemes of Positive, Neutral, and Negative. To define the categories, Negative references includes themes that would be inappropriate for the classroom such as violence, drugs, or other illicit activities. Neutral references includes themes that were school-appropriate but not necessarily a topic of interest to students. Positive references includes themes that were school-appropriate and might be of interest to students.

The types of numerical references that were coded as data included:

*Music:* Numerical references related to music as a whole. This includes artists' names (Andre 3000 out OutKast, for example), beat counts, musical equipment (such as references to 808 bass lines).

*Age:* References to age, whether the songs' speakers, or other characters. Due to the highly detailed nature of Eminem's lyrics, the overwhelming majority of these occurrences can be found in his work.

*Time:* This data type refers to either stretches of time (jail sentences, for example), or points in time, such as years or time of day.

*Weapons:* Referring to weapon names (AK-47, for example), or caliber of ammunition (such as .380 slugs).

*Accomplishments*: Refers to marks of accomplishments such as 5 Mics (highest rating in Hip Hop magazine *The Source*), chart positions, numbers of records sold, material possession (500 Benz), size of rims on limousines, etc.

*Drugs*: Refers to drugs in slang terms, usually in quantities bought or absorbed (40s, number of pills, etc.).

*Money*: Monetary amounts, proceeds of record sales to hourly wages.

*Geography*: Unlike in the previous Hip Hop study (Tillman et al., 2015), this category included no mentions of gang-affiliated territory and the like. Occurrences entail locations (“south of [Michigan highway] 10”), or distances (“20 miles away.”)

*School*: A category comprising exclusively references to grade level (usually 3<sup>rd</sup> to 5<sup>th</sup>), usually in relation to the beginning of some form of truancy from formal schooling.

*Math per se*: Mathematics per se. This includes percentages, as well as scientific knowledge (nine planets or speed of sound, for example).

*Miscellaneous*: Category of thematic or numerical outlier (phone numbers, women’s bodily measurements, etc.), or matters of straight enumeration (a trillion times, for example).

*Crime*: Scant data in this category, a few references referring to speed limit infractions and jail time.

Table 1 below displays the distribution of the coded numerical data types for each album, and a brief description for each type follows.

*Table 1*  
**Descriptions of Numerical Data Types**

Data Type:	<i>Slim Shady LP</i>	<i>Marshall Mathers LP</i>	<i>Stankonia</i>	<i>Eminem Show</i>	<i>Speaker-bosxx/The Love Below</i>	<i>The College Dropout</i>	Totals
Music	3	4	5	0	1	3	16
Age	6	9	1	4	0	2	22
Time	5	12	5	4	5	6	37
Weapons	2	11	0	1	1	0	15
Accomplishments	2	5	4	4	1	7	23
Drugs	2	6	1	0	0	0	9
Money	5	6	1	2	1	6	21
Geography	0	3	0	0	0	1	4
School	0	3	0	1	0	0	4
Math per se	2	2	2	0	1	0	7
Miscellaneous	0	9	7	4	7	6	33
Crime	0	1	0	1	0	0	2
Totals	27	71	26	21	17	31	193

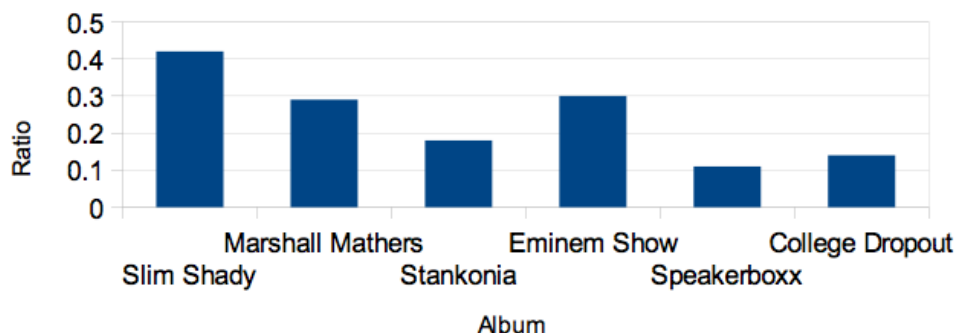


**Referential vs. symbolic.** As per previous studies in this line of research (i.e., Tillman et al., 2015) the referential/symbolic criterion, which denotes whether a numerical reference is numerical per se, or whether its value is symbolic (that is, not purely numerical) was applied to the data. Additionally, the symbolic references were separated into the three subthemes of Positive, Neutral, and Negative according to the criteria describe earlier (see table 2).

*Table 2*  
**Album Title and Relationship to Numerical Components**

Album Title	Relationship to numerical components			
	Referential	Symbolic		
		Positive	Neutral	Negative
<i>Slim Shady LP</i>	Age (6)	Accomplish-ments (2)	Time (5)	Weapons(2)
	Math (2)		Money (5)	Drugs (2)
<i>Marshall Mathers LP</i>	Age (9)	Accomplish-ments (5)	Music (3)	Drugs (6)
	Math (2)		Time (12)	
	Geography (3)		School (3)	
<i>Stankonia</i>	Age (1)	Accomplish-ments (4)	Music (5)	Drugs (1)
	Math (2)		Time (5)	
			Money (1)	
<i>Eminem Show</i>	Age (4)	Accomplish-ments (4)	Time (4)	Weapons (1)
			Money (2)	Crime (1)
			School (1)	
<i>Speakerboxx / The Love Below</i>	Math (1)	Accomplish-ments (1)	Money (1)	Weapons (1)
			Time (5)	
			Music (1)	
<i>College Dropout</i>	Age (2)	Accomplish-ments (7)	Time (6)	----
	Geography (1)		Money (6)	
			Music (3)	

The referential category comprised age iterations, the mathematics category, and geography. Since the later did not entail mentions of territory but instead had an actual story telling purpose, these references were understood to entail logical/spatial reasoning. Likewise, age references were understood to entail logical/time reasoning. On the other hand, time elements referring to duration were valued in the storytelling framework as symbols (such as, “Every day’s the 14<sup>th</sup>,” referring to Valentine’s Day). Given its quality as a statistical outlier, the “Miscellaneous” category was omitted for this data compilation. Figure 1 shows the relationship and distribution of the ratio of referential to symbolic numerical references plotted as a percentage.



**Figure 1.** Ratio of referential to symbolic numerical references per album.

Although the data shows a somewhat downward trend, this might only be due to Eminem's persistent focus on highly detailed narrative, which skews the data towards more referential references. The work of OutKast and Kanye West displays a relatively similar proportion of referential versus symbolic references, ranging between 10 and 20 percent. The variation in data may therefore be due to personal styles of these individual four artists (the band OutKast consists of two rappers, Andre 3000 and Big Boi), more so than general trends in Hip Hop, or attitudes towards numeracy.

**Numeracy within the Albums by Eminem and OutKast.** Eminem gained prominence in the early 2000s. His work exemplified the usual tropes of Hip Hop including urban poverty, and a rebellion against societal ills, blended with a highly personal presentation-style. Numerical references in his work entail a much wider range than West's album, and occurrences to crime and drugs are much more predominant. One can also note that drug use is much more violent and problematic in Eminem's songs (which discuss addiction and Eminem's own struggle with drug and alcohol abuse, hard drugs, and escapism from the hardships of life), than in West's songs, where getting high on marijuana is the extent of the drug use discussed. Referential numerical iterations also often acquire a metaphorical quality in the lyrics as Eminem assembles poetry out of seemingly random bits of knowledge.

Numerical data in OutKast's work distinguishes itself for its more anecdotal nature. While several usual tropes of Hip Hop language come up through *Stankonia* and *Speakerboxx/The Love Below*, and narrative exigencies entail some time elements, the strongest category for both Grammy winning OutKast records is the "Miscellaneous" category. There are almost no referential iterations, and the focus is more on generating engaging storytelling and personally meaningful narrative. The presence of numerical Bible references and quotations in specific verses of OutKast's lyrics are noteworthy, as religious themes also emerge in Kanye West's lyrics, although rarely in conjunction with numerical data.

**Numeracy within the Album by Kanye West.** The release of *The College Dropout* in 2004 marked a departure from trends in Hip Hop at the time. Since the mid-1990s, Hip Hop had been dominated primarily by the

gangsta rap aesthetic, and other forms of lyrical braggadocio. West's use of innovative sampling and song structure was different from both East coast and West coast rap, as was his use of introspective and vulnerable lyrics. The facts of West's biography also set him apart from Hip Hop trends: his mother was a teacher, and he grew up internationally (born in Atlanta, spent time being educated in China, then grew up in Chicago), so that he was from a more middle class sensibility and cosmopolitan background than is commonly associated with Hip Hop artists such as Eminem, who grew up in Detroit, or OutKast, which grew up in Atlanta. The fact that Kanye West extensively discussed finishing high school and attending college in his debut album was also divergent from the classical Hip Hop narrative, which often emphasized disdain for formal educational systems, and instead favored narratives about getting a real-life education by hustling on the streets.

Of all six records analyzed in this study, the data in *The College Dropout* was the least varied along the topic of numeracy. Only 6 of a possible 12 categories were represented on the record. Most notably, unlike the other albums analyzed, numerical references to weapons, drugs and crime were completely absent, and only 3 of 31 numerical references fell in the referential category. Just as his musical productions cannot be easily siloed into one genre, West's lyrical content is also a departure from classical Hip Hop iconography, and when he does brings up usual Hip Hop themes, his approach is often literary rather than literal. The numerical data pertaining to money oscillated between the low monetary amounts associated with the 9-to-5 life, and the larger quantities success in a musical career entails along with accompanying material markers of status, such as Mercedes Benz cars and the like. Time elements displayed the same element of urgency as is traditionally present in Hip Hop, however there was also the presence of lyrical themes accentuating that both time and fame are fleeting.

Thematically, *The College Dropout* addresses West's decision to withdraw from college and pursue a music career (he had been attending art school, as well as studying literature at the time). Thus, while the usual Hip Hop topics of street life such as dealing with gangs and drugs do come up throughout the album, the main thematic concerns of the lyrics are about how college felt like a fast track to a dead-end job, and that therefore working odd jobs to make ends meet while pursuing an undergraduate degree seemed like it would only lead to a bland 9-to-5 life. Unlike most rappers, West's rejection of this life is primarily an aesthetic decision, more so than a choice forced upon him by the impoverished opportunities that arise from low socio-economic circumstances, and the discussion of qualitative findings that follows will further articulate this theme.

### **Qualitative Findings**

Analysis of *The College Dropout* showed that the lyrical and thematic content of the music album focused heavily on Kanye West's decision to self-

select withdrawal from his undergraduate college education prior to matriculation. Many of the tracks on the album, including the tracks “Graduation Day,” “School Spirit,” and “Family Business,” display West’s talent for articulate description of the complex motivations driving this decision. Despite a misleadingly simplistic album title focused on the artists’ ultimate decision to withdraw from college, the full body of the work presented a complicated narrative colorfully voicing the artist’s experience before and after withdrawing from undergraduate university education so as to focus on a career as a musician. In addressing this topic, the narrative of *The College Dropout* begins with a track titled “Intro” with a run-time of 19 seconds. This “Intro” presents a monologue from a faux college professor, played by actor DeRay Davis impersonating the voice of comedian Bernie Mac, asking a request of the musician to set a positive tone with the album:

Kanye, can I talk to you for a minute? Me and the other faculty members was wondering, could you do a little something beautiful, something that the kids is going love when they hear it, that’s going to make them start jumping up and down and sharing candy and stuff, think you could probably do something for the kids for graduation to sing? (West, 2004d)

The remainder of the album is framed as a response to this rhetorically posed question, beginning with the deceptively agreeable initial response from West: “Oh yeah, I’ve got the perfect song for the kids to sing.” (West, 2004d) But what then follows is instead a multipart narrative containing 19 tracks examining the complex motivations and moods driving West’s decision to withdraw from college and focus instead on pursuit of a career as a musician.

West’s inaugural declaration on the album in his own voice, stated sans music or melody—“Oh yeah, I’ve got the perfect song for the kids to sing”—is a crafty prelude to the first musical track titled “We Don’t Care.” The “We Don’t Care” musical track begins with a chorus describing the obvious need to resort to illegal moneymaking activities to survive in an impoverished urban area and the high mortality rate that results from this lifestyle, with black males sometimes dying before the age the age of twenty-five (West, 2004g; full lyrics available at [www.kanywest.com](http://www.kanywest.com)). West’s message is clear: The attempted reparations that have been made to African-Americans since the U.S. outlawed slavery have not been sufficient or successful, leaving illegal drug-dealing as one of the only real options to escape poverty for black metropolitan youth in cities like Chicago. Rather than express shame or loathing for this harsh reality, West instead chooses to glorify the entrepreneurial resourcefulness as an inevitable reaction to the dearth of legal career options, exhorting the audience to echo the lack of concern regarding the judgment of others and repeat the song’s title along with the album (West, 2004g).

West’s lyrics make a candid effort to acknowledge the difficulties faced by ambitious black urban youth in cities like Chicago seeking a better

life through legitimate means such as a college education, but resorting to illegal means out of desperation. West's first verse within "We Don't Care" further details the nuance of this narrative theme, namely the unavoidable legitimization of illegal moneymaking if there is an absence of legal alternatives (West, 2004g). West here presents a portrait of the illegal drug-seller as the only visible example of an accessible escape from poverty for black male youth living in the city. This verse provides an explicit articulation of West's belief that illegal moneymaking is both inevitable—and even appropriate—when there are no other viable alternatives available to alleviating poverty. In another song lyric with a similar theme, West describes his own understanding of the selling of illegal drugs as a means to self-generate the metaphorical equivalent of a college scholarship for youth to whom a real scholarship does not seem realistically obtainable (West, 2004g).

After the conclusion of "We Don't Care" the professor character returns in a brief performance during which he scolds West for the lyrical content of the "We Don't Care" song because it does not meet the professor character's expectations of an appropriate entertainment-education prosocial message, particularly because of the lack of a "stay-in-school" themed message. The professor character yells at Kanye West: "You will not walk across that stage, you won't slide across that stage! ... I told you to do something uplifting!" West again responds to the professor's statement, but now his tone has changed and his message is no longer directed to the professor—instead he communicates directly to the audience. On a track titled "Graduation Day" he says he is no longer confused about what he will do with his life, because he has found something more appropriate to his goals than college. He ends the dialogue with a farcical request that the audience not tell his mother, a professor in real-life, about his new plan (West, 2004c).

The influence of West's mother on his own development and outlook, particularly on the topic of education, cannot be overstated. During West's youth his mother, Dr. Donda West, served as the Chair of the English Department at Chicago State University, as well as a Professor of English at Clark Atlanta University, a historically black university in Georgia. She also taught at Nanjing University in China, where she enrolled her then aged ten son Kanye in an otherwise all Chinese elementary school classroom (West & Hunter, 2007). The origins of Kanye West's conception of the presence of institutionalized racism in the United States is deeply rooted in his mother's life experiences, as expressed on the track "Never Let Me Down" wherein West describes the details of how his grandfather and his mother were arrested during a protest sit-in at a racially segregated restaurant in Atlanta, Georgia, when she was a child of six years old (West, 2004e).

West then uses a track titled "All Falls Down" to describe a female friend's experience with undergraduate education and the growing insecurity she developed as a result of not having a college major associated with strong employment options or future remuneration. At that same time, according to

West, she did not want to withdraw from college because she feared disappointing her parents (West, 2004a). West presents through this vignette the message that for those black urban youth that have the skills and resources to enter and progress through undergraduate education, many of the career options are less than inspiring for someone with only a bachelor's degree, particularly if in a non-STEM (science, technology, engineering, and mathematics) or other high-salaried professional area. At a certain level this message is directed at listeners who are themselves struggling college students looking for empathy and guidance, but there are also other more critical messages implied, which West eventually states directly.

As the album progresses West's ultimate prosocial message, and perhaps his most personally relevant and poignant, is the denial of human potential inherent within single-minded pursuit of material wealth, regardless of legal legitimacy or illegitimacy. The lyrics of "All Falls Down" are perhaps the most unequivocal articulation of this message (full lyrics available at [www.kanywest.com](http://www.kanywest.com)), wherein he describes what he perceives as the flaw with the American dream—the debasement of both self and others that is often required to achieve the materialistic markers of success (West, 2004a). West's focus in the lyrics of this song as well as throughout much of the broader album are upon the human costs, including potential self-hatred, that accrue during a relentless pursuit of wealth and other markers of success. This theme can be understood as a more specified embodiment of his earlier premeditated, but more ambiguous statement that the objective of the album was to consciously disseminate the prosocial message of "life is about using people ... just don't misuse them" (West, 2003 interview by D. Feld; video)—a particularly dissimilar message from the traditional pro-careerism tone of "stay-in-school" styled narratives.

## **Discussion**

As mentioned earlier, each of the Hip Hop albums coded and analyzed in the present study received substantial critical and commercial success at the time of their release. Although Eminem's records were noted for their controversial lyrical content, which some interpreted as violent, misogynistic and homophobic, closer readings revealed instead the complex interrelationships between Eminem's multiple alter egos, including the successful rapper Eminem, the person Marshall Mathers whose initials became the name of the rapper, the unpredictable prankster character Slim Shady, as well as several others. His records often displayed highly personal narratives, usually communicated via outlandish humor, where Eminem's struggles with poverty, drugs, sudden fame, the music business, fatherhood, and several betrayals that he has endured in his life, took center stage in the narratives. OutKast's albums, in contrast, have been noted primarily for their musical innovation, blending genres as diverse as Christian gospel with

psychedelic rock, and in the process creating a Southern Hip Hop sensibility that had a wide appeal to both audiences and critics. In contrast to the 2000 through 2004 *Best Rap Album* winners, which were all won by either Eminem or OutKast, when *The College Dropout* was nominated in 2005 it was noted for its innovative use of sampling, its wide and nuanced palette of instrumentation, but perhaps most of all for its lyrical portrayal of the artist's insecurities and deep-felt worries. At the time, this was a pronounced departure from the traditional braggadocio that characterized much of rap, including the previous Grammy winning albums by Eminem and OutKast, as well the lyrics of all the Jay-Z songs that West had produced for the rapper.

Historically, intersections between Hip Hop culture and K-12 education have been studied from several perspectives. These have included: sociolinguistics, critical theory and pedagogy, as well ethnographic research approaches. This study analyzed an award winning Hip Hop music album *The College Dropout* (2004) that presented a language of schooling narrative about the artist's experience with college and subsequent decision to dropout before graduation, as well as compared the content of the album to the five previous Grammy winners for *Best Rap Album* in terms of their portrayal of numeracy and mathematics. The general outlook of the data analyzed roughly corresponded to the conclusions reached in a previous study of Hip Hop themed media, where the usage of symbolic numerical references vastly outnumbered referential numerical references, and where formal educational systems were often perceived as synonymous with institutionalized racism (Tillman et al., 2015).

Kanye West's debut album about his experiences during undergraduate education, and subsequent decision to dropout prior to graduation, provides insight into the mind of a highly creative student, demonstrating a work ethic that is equally impressive, and delivers opportunity for understanding why such a student decided to disengage from formal education. From a certain standpoint, *The College Dropout* can be understood as an indictment of formal education and its focus on abstract concepts and theories that are seemingly disconnected from students' real-life problems and interests. This problem has been noted as particularly rampant in mathematics education (An et al, 2013). Analysis of popular media productions has the potential to be informative to adults working in support of mathematics education, especially those who work in academic student affairs or who are policy makers. Through *The College Dropout* album we are given access to an eloquent perspective, at the level of an individual human student, struggling with formal education and discussing what it means to be subjected to personally irrelevant instruction. This narrative contains not only a message to students, but also to their teachers and others in power within formal education—and perhaps that might also partially explain why the album was so popular with multiple demographics.

Before proceeding to the conclusions section, some research limitations to this study should be noted. First and foremost, this study did not explore any direct educational impacts resulting from students listening to Hip Hop musical albums. Future research in this line of inquiry will examine the impacts music and lyrics has upon students' mathematics learning outcomes as well as attitudes toward STEM careers. Second, only six albums were analyzed and these albums were all selected from a time period spanning a single decade; though consistent themes were found, other music not analyzed during this study might display different findings. Third, the data analysis was filtered through the research-lens and life-experiences of the research team, and although we strove for objectivity it is conceivable that another research team would develop differing emergent subthemes, or vary in their specific coding of individual numerical references in the data, and therefore integrity of replicability is a concern.

### Conclusions

This analysis does not make any claims about the educational impact of West's album but considers only its impact on students outside of school, as indicated by its critical and commercial success. The educational message in *The College Dropout*—as in many entertainment-education media productions—is outside the scope of what most K-12 educators consider the core curriculum of literacy and STEM skills, and is closer to an artistic, morality, or citizenship-based educational message. This model of education-entertainment is also typical of published research on this topic within communication journals, wherein prototypical E-E is closer to a parable about the Golden Rule than a song about a multiplication table. Despite these design limitations, several noteworthy findings were determined from the data analysis, and will serve as the topic of the remainder of this paper.

The research study presented in this original paper analyzed popular albums ( $n=6$ ) which contain narratives about Hip Hop musicians' achievement of success. Our goal was to ascertain if the messages disseminated in the movies supported or refuted the heuristic notion teachers and parents tell children about the usefulness of math skills for getting a good job. movies about musicians. In order to do so, the objectives of the study were as follows: (1) to determine, through empirical analysis, what values were displayed about schooling in general, whether explicitly or implicitly, during the portrayal of numeracy and mathematics in Hip Hop music lyrics; (2) whether these values affirmed mathematics as a necessary skill or form of knowledge to succeed; and (3) assess whether the examples presented by these role models in the narratives in their Grammy winning albums encouraged or refuted the heuristic notion advocated by parents and teachers, namely that: "You need math skills to get a good job."



The present examination of the selected music albums helped clarify the reality of the depictions of numeracy and mathematics within a selection of popular Hip Hop albums. In the current digital era, the boundaries between traditional schoolhouse curricula and out-of-school learning are increasingly getting blurred (Slattery, 1995). This situation calls for innovative STEM education wherein we reconsider the values and meanings behind the hidden curriculum contained with popular media such as music lyrics, and better employ these resources and tools for teaching STEM content in a manner that encourages students to understand mathematics as a thriving academic discipline, through which any student that applies themselves can learn STEM content and enjoy a rewarding career. The study was undertaken as part of a broader line of inquiry addressing the impacts of popular media—also called pop media or mass media—upon adolescent-aged youth. Previous studies in this line of inquiry have analyzed the cultural representations of scientists and engineers in popular movies (Steinke, 2005), the images STEM-professionals within children's programs in the United States (Long & Steinke, 1996), as well as portrayals of male and female scientists in television programs popular among middle school-age children (Long, et al., 2010). Collectively, these research studies have shown popular media to have enormous power in determining which role models and behaviors are considered desirable versus undesirable to students (Long, Steinke, Applegate, Lapinski, Johnson, & Ghosh, 2010; Rushkoff, 1999; Steinke, 2005).

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