ADDRESSING THE NEEDS OF THE MARGINALIZED STUDENTS IN SCHOOL MATHEMATICS: A REVIEW OF POLICIES AND REFORMS

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Introduction

An examination of past research, policies, and reforms in mathematics education suggests that there have always been, and remain, tensions in conceptualizing the aims and goals of mathematics teaching and learning. These tensions have focused on addressing three concerns: (1) what mathematics students should learn; (2) how students should be taught mathematics; (3) who is qualified to teach mathematics? When examining how responses to these questions have addressed the needs of learners who are identified as marginalized (defined here as Black[1], Latin@[2], Indigenous, and poor) there is a constant pattern in which they are routinely given the least access to advanced mathematics content, the fewest opportunities to learn through methods other than memorizing facts and mimicking teacher-modeled procedures, and the least access to well-prepared mathematics teachers (Berry, Ellis, & Hughes, 2014). As a result, these learners experience the following conditions: a) reduced access to advanced mathematics courses that prepare them for higher education and improved career options; b) routine exposure to activities that focus primarily on rote, decontextualized learning through drill and practice with little to no engagement that promote reasoning and use mathematics as a tool to analyze social and economic issues, critique power dynamics, and build advocacy; and c) less access to qualified teachers of mathematics who both understand mathematics deeply and understand their students' cultural and community context deeply in order to give learners access to mathematical knowledge (Ellis, 2008; Flores, 2007; Gutiérrez, 2008; Martin, 2007). The effect of these conditions on marginalized learners' attainment in mathematics demonstrates well that such an approach constrains outcomes to a narrow range of proficiencies focused on basic skills.

While the disproportionality and conditions of marginalized learners is a cause for concern, it is important to understand that addressing the needs of these learners may not have been the primary goal of prior policies and reforms in mathematics education. Berry, Ellis, and Hughes (2014) argued that prior policies and reforms in mathematics education have failed due to having been developed to address the needs and interests of the larger dominant culture[3], not those of marginalized learners. In fact, many past policies and reforms in mathematics teaching and learning have come at the expense of the needs and interests of marginalized learners by framing policies and reforms based on economic, technological, and security interests of the dominant culture. There are statements such as "Mathematics has become a critical filter for employment and full participation in our society. We cannot afford to have the majority of our population mathematically illiterate: Equity has become an economic necessity" (NCTM, 1989, p. 4). This situates equity in mathematics education as serving economic interests of the dominant culture by situating participation as supporting the drivers of an economy. A consequence of this framing is that participation in mathematics education is based on ensuring that the dominant culture's economic, technological, and security interests are met rather than addressing the needs of learners. Examining the convergence of interests allows us to understand the motivating factors for policies and reforms that might lead to fortuitous benefits for marginalized students.

Derrick Bell, a former attorney with the National Association for the Advancement of Colored People (NAACP) during the Civil Rights Era, employed his interest-convergence principle to explain how the United States Supreme Court issued the landmark ruling in *Brown v Board of Education of*

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Topeka, Kansas (*Brown I*) in 1954. The Supreme Court's ruling in the *Brown* case revoked the "separate but equal" doctrine, which legally sanctioned segregation in public education and all aspects of daily life. Bell (2004) argued that the *Brown* decision was not the result of America coming to terms with its democratic ideals or moral sensibilities. Rather, the Supreme Court was more interested in providing "immediate credibility to America's struggle with communist countries to win the hearts and minds of emerging third world people" than in doing what was morally right (p. 233). Thus, under the interest-convergence principle, the *Brown* decision is best understood as progress requiring the coincidence of a pressing issue, more than a commitment to justice (Donnor, 2005).

Brown provided the impetus for legislation, such as the Elementary and Secondary Education Act (ESEA) of 1965 and it reauthorizations Improving America's School Act of 1994 and No Child Left Behind Act (NCLB) of 2001 (Zion & Blanchett, 2011). These along with other legislations and mandates established requirements that address the need to ensure that all students in the United States are provided equal educational opportunities. Although not fully realized, the requirements of these legislative acts and mandates created pressure to address the historical inequity in educational opportunity, achievement, and outcomes. Zion and Blanchett (2011) argued that the reason why large scale improvement in outcomes for all students have yet to be realized is that the problem has not yet been framed appropriately. The problem must be framed as part of the history and legacy of racism, and as an issue of civil rights and social justice, viewed through a critical lens. This article use a critical lens to apply the interest-convergence principle informed largely by the work of legal scholar, Derrick Bell (1980 & 2004), to examine motivating factors of policies and reform efforts in mathematics education. Specifically, this article makes the case that policies and reforms in mathematics education were not designed to address the needs of marginalized learners; rather these policies and reforms are often designed and enacted to protect the economic, technological, and social interests of the dominant culture.

Theoretical Framework: Interest-Convergence Framework

Social institutions are set up by those in power and are organized to support and value the types of cultural and social capital held by those in power (Bourdieu & Passeron, 1990). Schools are institutions where power is controlled by the dominant culture's interests. In many schools we find values of individualism and independence, self-direction, competitiveness, decontextualized teaching, and passive methods of communication and learning (Stein, 2004). For many marginalized students, they must choose to engage using the values of the dominant culture or choose to resist becoming a part of the value set (Zion & Blanchett, 2011). Policies and reforms in education, and those particularly geared to marginalized learners, often portray these learners as deficient or in need of "fixing" to be more align with the values of the dominant culture (Stein 2004). Stein (2004) described the language of education policies as positioning marginalized people as being culturally deprived and deficiencies for marginalized learners are within their cultures, families, and communities. Consequently, policies and reforms frame marginalized students as problems to fixed through labels (i.e. Title I students; culturally deprived) then propose policies and reforms that are in the interests of those in power. That is, if marginalized students adopt the values of the dominant culture, then the economic, technological and security interest of those in power are maintained. Policies and reforms are more about the dominant culture's interest and less about needs and interests of marginalized students.

Interest-convergence is an analytical viewpoint for examining how policies and reforms are dictated by those in power to advance their political, social, and economic interests (Donnor, 2005). Bell's (1980; 2004) interest-convergence principle theorizes that any empowered group will not help any disempowered group unless it is in their best interest to do so. For Bell, the historical

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advancement of Black people's needs and interests is a result of being fortuitous beneficiaries of measures directed at furthering aims other than racial equity and social justice (Bell 2004). Bell states, "Even when interest-convergence results in an effective racial remedy, that remedy will be abrogated at the point that policymakers fear the remedial policy is threatening the superior societal status of Whites, particularly those in the middle and upper classes" (Bell, 2004, p. 69). Interest-convergence has its theoretical grounding in critical race theory (CRT) which draws from a broad literature in law, sociology, history, education and women's studies (DeCuir & Dixson, 2004; Ladson-Billings & Tate, 1995; Matsuda, Lawrence, Delgado, & Crenshaw, 1993; Solorzano & Yosso, 2001). Historically, its roots can be traced to legal studies. With respect to CRT's use in education, as Solorzano and Yosso (2002) explained, "critical race theory in education is a framework or set of basic insights, perspectives, methods, and pedagogy that seeks to identify, analyze, and transform those structural and cultural aspects of education that maintain subordinate and dominant racial positions in and out of the classroom" (p. 25). In education, interest convergence provides framework to discuss power dynamics as framed by systemic interests and a loss–gain binary (Milner, 2008). Interest-convergence has been used to examine policies and practices related to teacher education programs (Milner, 2008); practices for STEM education serving marginalized learners at universities (Barber, 2015); intercultural movements in multicultural education (Caraballo, 2009); inclusion and equity in special education (Zion & Blanchett, 2011); intercollegiate athletics (Donner, 2005); the development of historically Black colleges and universities (Gasman & Hilton, 2012); and postsecondary access for Latino immigrant populations (Alemán & Alemán, 2010). This body of work provides the lens for using the interest-convergence principle to examine the motivating factors for policies and reforms in mathematics education to understand whose interests are served and the resulting fortuitous beneficiaries.

Historical Perspectives in School Mathematics

In their review of the history of school mathematics, Ellis and Berry (2005) noted a tension that reforms in mathematics education focused on efficiencies with an emphasis on procedural learning coupled with a belief that mathematics beyond arithmetic should be reserved for those deemed capable of advancing to such heights. Efforts to improve mathematics education,

> …situated many learners in an a priori deficit position relative to disembodied mathematical knowledge—meaning learning mathematics was taken to be harder for certain groups of students due to their backgrounds and/or innate abilities—and failed to acknowledge the importance of mathematics for all students. (Ellis & Berry, pp. 10-11)

Throughout this history, systems of standardized assessment were developed as a means to justify the separation of students within and between schools by race, class, and ethnicity. The use of assessments to stratify was built on the assumption that a distribution of mathematical ability exists that can be fairly measured and meaningfully interpreted as the basis for separating students and providing unequal access to opportunities to learn mathematics. The conflation of this with societal beliefs about race and intelligence cannot be overlooked; the interest of those with power was preserved. This article documents some policies and reforms along the historical trajectory in mathematics education using the lens of interest-convergence to examine whose interests are served and whether there were any fortuitous benefits for marginalized students.

New Math, Sputnik, & Brown

The launch of the first artificial satellite, *Sputnik*, on October 4, 1957, by the Russians gave impetus to the drive to improve mathematics education in America. The launching of *Sputnik* brought heightened concern about America's national security as well as concern that America was

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lagging behind the Russians in mathematics and science. Influenced by the launch of *Sputnik*, federal funds for mathematics education became available through the National Defense Education Act (NDEA) of 1958 (Walmsley, 2003). Title V of the NDEA Act laid the groundwork for gifted programs and began the trend of using standardized testing in schools to measure competency (Walmsley, 2003). NDEA provided funds to identify "best and brightest" young scientific minds and was designed to fulfill defense interests in mathematics, science, engineering and foreign languages. The appeal to identify "best and brightest" was built on protecting national security and defense interests (Tate, 1997).

Approximately three years prior to the launching of *Sputnik*, the United States Supreme Court issued the landmark ruling in *Brown v Board of Education of Topeka, Kansas* which revoked the "separate but equal" doctrine. Black parents and community leaders sought desegregation based on the assumption that better school resources accompanied schools were White children were taught and that better resources provided greater opportunities. The *Brown* decisions occurred in the midst efforts to reform what mathematics should be taught and how it should be taught. This reform, the "new math" reform, offered teaching new mathematics content as well as new pedagogical approaches (Walmsley, 2003). One main idea of "new math" was to reduce focus on the drill and practice approach with approaches where students could develop conceptual understanding of mathematics. These pedagogical approaches included the use of manipulatives, guided-discovery learning teaching practices, and the spiral curriculum (Walmsley, 2003; Willoughby, 2000).

When we consider that many schools were still segregated and the process of desegregation was slow, and that schools serving Black children often received used textbooks handed down from schools serving white students (Snipes & Waters 2005), the reforms of "new math" did very little to address the needs of marginalized children, specifically Black children (Tate, 2000). That is, Black children did not have access to new content nor experienced the pedagogies to teaching associated with the "new math" reform. Within the interest-convergence framework, this era was characterized "benign neglect" (Tate, 2000; p. 201) for marginalized students because the needs and interest of marginalized students were largely ignored. This does not imply that these learners did not have access to quality teaching in segregated schools, in fact, there is a body of research that suggest that many teachers in segregated schools "made do" with substandard materials and provide high quality teaching (Foster, 1997; Siddle-Walker, 2000; Snipes & Waters, 2005; Standish, 2006). Rather, the "new math" reforms focused on identifying the best and brightest while ignoring the needs of marginalized students.

Great Society & Segregation

During the mid-1960s, President Lyndon Johnson had a vision for a "Great Society," which was an effort to address issues of civil rights, poverty, economic inequities, health care, housing, jobs, and education (Levitan & Taggart, 1976). Title I was enacted through the Elementary and Secondary Education Act of 1965 which allocated federal funds to schools with high concentrations of poverty in order to improve the educational opportunities of poor students (Wong & Nicotera, 2004). The Civil Rights Act of 1964 forbade job discrimination and the segregation of public accommodations; the Voting Rights Act of 1965 suspended use of literacy tests, other voter qualification tests, and stopped poll taxes; and the Civil Rights Act of 1968 banned housing discrimination and extended constitutional protections to Native Americans on reservations. These legislative acts provided greater opportunities for marginalized people but the activities of the Civil Rights movement facilitated these acts. In response to the radical protests of this period, the interest of those motivated by America's image to the world converged with the interests of the Civil Rights movement (Bell, 1980).

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In 1966, the *Equality of Educational Opportunity,* commonly referred to as the Coleman Report, argued that school resources had little effect on student achievement and that student background and socioeconomic status are much more important in determining educational outcomes (Coleman, Campbell, Hobson, McPartland, Mood, & Weinfeld, 1965). The Coleman report was a challenge to President Johnson's policies on education that increased spending. One finding that received significant attention from policymakers was that peer effects had a significant impact on student achievement, meaning the background characteristics of other students influenced student achievement. This finding was interpreted to mean that marginalized children, specifically Black children, would have higher test scores if a majority of their classmates were white (Wong & Nicotera, 2004). This finding coupled with the tensions of desegregation was a catalyst for busing that occurred in many places in the United States. Busing was an effort to desegregate schools and marginalized children were more likely to be bused than white children. Thus, many marginalized children were displaced from their neighborhoods (Doughty, 1978). Busing was a policy sought to "fix" marginalized students because it existed primarily to assist these students by allowing them entrance to perceived superior schools that served white students; thus allowing marginalized students to receive the benefits of peer effect as described in the Coleman report. By displacing marginalized students from their communities, it positioned these students' communities as problem centers rather than as resources. In an effort to desegregate schools busing and peer effect policies served the interests of those who had power to make decisions about which children will be displaced from their home communities. Further, these policies assumed that immersion into schools serving white students will help marginalized students with better achievement and reap values that served the interests of those in power.

While busing sought to desegregate at the school-level, we must consider what happened at the classroom-level. In schools where significant numbers of marginalized children were bused, these children experienced resegregation for their mathematics instruction. In fact 70% of school districts had racially identifiable classrooms as a result of resegregation (Doughty, 1978). That is, because of the development of and placement in low-level mathematics courses, marginalized children were placed in mathematics classrooms that denied them access to high-level mathematics content and these students were in segregated classroom within integrated schools. Not only were students resegregated for mathematics instruction but a disproportionate number of marginalized students were placed in special education programs. Doughty (1978) estimated that 91% of Black children in special education programs during this period were incorrectly assigned on the basis of low expectations and inaccuracies in IQ scores. The misuse of a standardize test had negative consequences for many marginalized students. Michelson (2001) argued that resegregation in classrooms through tracking undermined any potential benefits of school-level desegregation. Given the consequences of resegregation at the classroom-level, it is plausible to consider that desegregation as policy for reform was a facade to hide the interests of those who wanted to maintain segregation but appease the interests who fought for desegregation.

Schools are as segregated today as they were in the 1960s and 1970s, and many schools are rapidly resegregating (Garda, 2011). In 2014, the percentage of public school students who were considered to be part of a racial or ethnic minority group was greater that the percentage of students considered being white (Hussar & Bailey, 2013). Yet, white children are the most racially isolated group of students in the United States; they have little contact with students from other ethnic groups. Nearly half of white students attend schools that are more than 90% white and approximately one-third of white students attend schools that are more than 95% white (Garda, 2011). These statistics suggest that *Brown* did not permanently integrate schools in the long-run; in fact the intended goal of racial balance and desegregation of *Brown* has not been realized.

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"Back to Basics"

In the late 1960s and early 1970s, the "back to basics" reform movement in mathematics emerged in response to the perceived shortcomings of "new math" (Burrill, 2001). During this period, the National Science Foundation discontinued funding programs focused on "new math," and there was a call to go back to the "core curriculum" which was understood to be basic skills in mathematics. The "back to basics" movement called for teaching basic mathematics procedures and skills and was closely connected to the minimum competency testing movement used extensively by states in the 1970s and 1980s (Resnick, 1980; Tate, 2000). Testing had a significant impact on the mathematics content that was taught and the methods used to teach mathematics. Typically, students were taught mathematics content deemed important for passing tests. Although the emphasis on skills did result in slightly improved standardized test scores for marginalized children, it did not adequately prepare these students for mathematics coursework requiring higher levels of cognition and understanding (Tate, 2000). Thus, marginalized students were underrepresented in the upper achievement distribution and in upper-level mathematics courses (Tate, 2000).

Considering the impact of desegregation and resegregation at the classroom-level coupled with an emphasis on testing, it plausible that the pedagogies and the curriculum offerings during the "back to basics" reform were similar for marginalized students during the "new math" reform. The pedagogies of "back to basic" were already apart of marginalized students' mathematical experiences. The growing emphasis on testing during this period was used to legitimize the perception that many marginalized students are not capable of rigorous studies in mathematics (Perry 2003). The "back to basics" movement provided more focus of using achievement tests to pathologize marginalized students as being inferior, deficit and deviant. We find the first of many research studies focusing on the achievement gap in mathematics during this period describing marginalized students as deficient and in need of fixing (Perry, 2003). The analysis of achievement gap language advantaged the values of the dominant culture and ignored the ongoing experiences resegregation of marginalized students. If one considers the context of the late 1960s and 1970s and the persistent limited educational opportunities available to marginalized children, discussion of an achievement gap serves to reinforce an ideology about marginalized children's intellectual inferiority. The focus on testing served the interest of those who focused on efficiency and stratifying learners to identify the "cognitive elite" (Hernstein & Murray, 1994) to protect the interest of those with power.

Increased Enrollments in Upper-Level Mathematics Courses

In 1983, the National Commission on Excellence in Education issued a report titled, *A Nation at Risk: The Imperative for Educational Reform*. The report suggested that education reform is necessary because competitors throughout the world are overtaking America's preeminence in commerce, industry, science, and technology. Furthermore, the report stated, "If an unfriendly foreign power had attempted to impose on America the mediocre educational performance that exists today, we might well have viewed it as an act of war" (p. 1). The inflammatory rhetoric of *A Nation at Risk* heightened concerns about national security and America was lagging in mathematics and science when compared internationally. *A Nation at Risk* stated that through educational reform, American children's promise of economic, social, and political security in the future would be earned by meritocratic ideals of effort, competence, and informed judgment.

As a reaction to *A Nation at Risk* Many states placed Algebra I as a high school graduation requirement. Between 1982 and 1992, students enrolled in Algebra I increased from 65 to 89 percent, in Algebra II from 35 to 62 percent, and in calculus from 5 to 11 percent (Raizen, McLead, & Rowe, 1997). Planty, Provasnik, and Daniel (2007) reported that the percentage of graduates who completed a semester or more of Algebra II rose from 40 percent in 1982 to 67 percent in 2004. This

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evidence suggests that the average number of mathematics courses at or above Algebra I taken by high school students has increased. The increased focus on maximizing students' performance on standardized tests has led schools to rethink course-taking patterns (Kelly, 2009). While there were increases in the enrollments rates of all students, the enrollment rates for marginalized students in higher-level mathematics courses was still relatively low (Jetter, 1993). Black students to be more likely to be enrolled in Algebra I and geometry but less likely enrolled in higher-level courses (Jetter, 1993). In the early 1990s, Bob Moses, a leader in the civil rights movement, argued that access to algebra is the "new" civil rights (Jetter, 1993). Moses contended that algebra served as a curricular gatekeeper tracking numerous students out of many in-school and out-of-school opportunities. Within an interest-convergence framework, Algebra I as a graduation requirement was to improve America's standing on internationally comparisons which lead to increase enrollments in for some marginalized students in high-level mathematics courses. These increased enrollments supported the economic, social, and political interests of those in power.

The increased enrollment in the upper-level mathematics courses did not influence instructional methodologies to meet the increase in the diverse learning needs of children (Porter, Kirst, Osthoff, Smithson, & Schneider, 1993). That is, for marginalized learners, instruction focused primarily on the acquisition of skills. Additionally, much of the increase in mathematics course enrollment occurred by simply placing students in Algebra I tracks. When the increased enrollment in mathematics courses seemed an insufficient means for increasing student achievement, policymakers and reformers began to investigate notions of systemic reform within the larger education system (Raizen, McLead, & Rowe, 1997). In the fall of 1989, President George H. W. Bush, the nation's governors, and other leaders held an educational summit in Charlottesville, Virginia. One result of this meeting was a call for national standards. Participants at the 1989 National Education Summit made a commitment to make U.S. students first in the world in mathematics and science by the year 2000.

Standards Movement

In 1980, NCTM put forth its *Agenda for Action*, which diverged from "back to basics." The *Agenda for Action* put forward recommendations that broadens the notion of basic skills as the acquisition of skills toward focusing on problem solving, use of technology, called for measures other than conventional testing, and an effort to meet students' diverse ne advocated for pedagogy and curriculum to accommodate the diverse needs of the student population. While the *Agenda for Action* was not a standards document, it was the foundation for the first standards document, *Curriculum and Evaluation Standards for School Mathematics* (*CSSM*), developed by NCTM (1989).

CSSM provided broad frameworks for mathematics content and processes across grade bands. Emphasis was placed on an inquiry-based approach to mathematics teaching and learning. The inquiry-based approach supported conceptual understanding as a primary goal and algorithmic fluency would follow once conceptual understanding was developed. Critics of *CSSM* argued that the primary goal of conceptual understanding through an inquiry-based approach did not help children acquire basic skills efficiently nor learn standard algorithms and formulas (Klein, 2003). *CSSM's* release came at a time when there were calls for national mathematics standards and it received support from the U.S. Department of Education and the National Science Foundation (NSF). Through the 1990s, NSF supported the creation and development of commercial mathematics curricula aligned to the standards in *CSSM*. Critics of the curricula objected to the inquiry-based approaches, claiming that not enough emphasis was placed on acquisition of basic skills and general mathematics principles (Klein, 2003). Tension between proponents and opponents of *CSSM* resulted in the "Math Wars." There were proponents for improving mathematics

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instruction for marginalized children on both sides of the "Math Wars." The primary tensions focus on mathematics content, pedagogical approaches, and student achievement, with both sides agreeing that reform is necessary for America's economic, technological, and security interests.

There is a long history indicating that during times of reform, the interests and needs of marginalized children are in many ways dismissed. The tensions of the "Math Wars" appear to have an underlying narrative focusing on the nation's technological interests, social efficiency, and perpetuation of privilege. There are intense debates focusing on curriculum, teaching, and assessment but little debate focusing on understanding the realities of children's lives. For marginalized learners, issues of race, racism, identity, and conditions were not under consideration in the "Math Wars." There is evidence from the *CSSM* to suggest that the standards were moving towards a democratic vision by including "for all" language. However, critics of the "for all" language argue that the use does not delve into serious considerations of the social and structural realities faced by Black children; rather the language suggests a myopic focus on modifying curricula, classrooms, and school cultures (Martin, 2003). Consequently, the underpinning of the "for all" message has done little to understand the variables that impact mathematics teaching and learning for marginalized learners.

The *CSSM* outlined four social goals for schools: (a) mathematically literate workers, (b) lifelong learning, (c) opportunity for all, and (d) informed electorate. These four goals derived from the fact that at the time society was moving towards an increase in technologies. These goals situated social justice issues in school mathematics within the framework of economic competition and national technological interests. Positioning social justice in mathematics education within the framework of economic competition and national technological interests situates mathematics education as being primarily utilitarian. Using the utilitarian perspective situates, increasing marginalized learner's participation in mathematics education is based on ensuring the economic and social interests of those with power. Consequently, the interests of marginal learners' needs are not given careful consideration; it was the interests of the broader American contexts that drove the implementation of standards. Within this context, mathematics is always situated as a utilitarian area of study, and the focus of mathematics education is on the needs of national interests rather than the needs of a democratic society.

NCTM revised it standards document in 2000 through the release of the *Principles and Standards for School Mathematics* (*PSSM*). The *PSSM* revision provided slightly greater emphasis on the importance of algorithms and computational fluency. *PSSM* was received as more balanced than *CSSM*, which led to some calming of but not an ending to the "Math Wars." *PSSM* highlighted equity as one of its six principles for school mathematics by stating that equity requires: (a) high expectations and worthwhile opportunities, (b) accommodating differences to help everyone learn mathematics, and (c) resources and support for all classrooms and all students. These points situate equity in a broad context but fail to recognize issues of social justice or understanding social, economic, and political context in which mathematics is learned. Martin (2003) is critical of *PSSM's* Equity Principle for not providing a sense of equity that considers the contexts of students' lives, identities of students, and conditions under which mathematics is taught and learned. He states:

> …the Equity Principle of the *Standards* contains no explicit or particular references to African American, Latino, Native American, and poor students or the conditions they face in their lives outside of school, including the inequitable arrangements of mathematical opportunities in these out of school contexts. I would argue that blanket statements about *all* students signals an uneasiness or unwillingness to grapple with the complexities and particularities of race, minority/marginalized status, differential treatment, underachievement in deference to the assumption that teaching, curriculum, learning, and assessment are all that matter. (p. 10)

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Too often, race, racism, social justice, contexts, identities, conditions, and others are relegated as issues not appropriate for mathematics education when in fact these issues are central to the learning and teaching of mathematics for marginalized students.

No Child Left Behind & Common Core

In 2002, President George W. Bush signed the Elementary and Secondary Education Act better known as the No Child Left Behind Act (NCLB) into law with the declared intention of helping "all students meet high academic standards" (NCLB, 2002). NCLB required states to implement student testing, collect and disseminate subgroup results, ensure teachers are highly qualified, and guarantee that all students achieve academic proficiency by 2014. States were required to use sanctions to hold schools and districts accountable for their success in meeting adequate yearly progress (AYP) goals, set by the states, for both overall performance and performance in each subgroup. Similar to previous reforms, NCLB motives are cast in the interests of improving America's standing international measures and the interests of the future of the dominant culture maintaining power. NCLB narrows the definition of achievement, thus focusing on measureable outcomes and applying technical solutions, such as setting Standards and using tests to measure attainment of the standards. NCLB stated a desire to close the "achievement gap between high- and low-performing children, especially the achievement gap between minority and non-minority students and between disadvantaged children and their more advantaged peers" (NCLB, 2002; Sec 1001). To achieve these goals NCLB takes a position in instruction and measurement by insisting that instructional approaches be deemed based on "scientifically based research" (Stein, 2004). However, it is not clear in NCLB what constituted "scientifically based research." Given the language of measurement focused on closing the achievement gap and the language of standards, it is plausible that "scientifically based research" instructional approaches are approaches that can be measured and quantified. Through standards and assessment there are restrictions in the autonomy of teachers. Consequently, teachers are restricted in the ways to meet the needs and interest of students. NCLB assumed that members within a subgroup have static identities that are quantifiable in term of race, class, gender, language, etc. (Gutierrez, 2008).

NCLB unintentionally create incentives that encourages states to lower their academic standards, promote school segregation and the push out of poor and minority students, and reinforces the unequal distribution of good teachers (Ryan, 2004). The category of "failing school" was based on whether or not schools met a set of performance standards drafted by the states which were grounded in test-based measures of academic proficiency, states had incentives to lower their standards so that fewer schools are identified as failing (Ryan, 2004). Stein (2004) found that many states lowered performance standards rather than raised standards. To improve the chances that a particular school or schools within a district make AYP, administrators have an incentive to minimize the numbers of marginalized students. Since marginalized students traditionally do not perform as well as white and more affluent peers on standardized tests, the incentives to exclude these students are grounded on improving status (Ryan, 2004). Attaching consequences to test results creates incentives for teachers to avoid schools that are likely to not meet AYP. Thus, teaching will be less attractive in those schools where teachers must spend a great deal of time preparing for the tests.

In mathematics education, it is likely that marginalized students' needs and interests were served minimally by NCLB. As with previous reforms, these students most likely experienced mathematics as procedural and rote. This time of instruction appears to be consistent across all reforms. Similar to other reforms, the emphasis on testing was used to legitimize negative perception about marginalized students' capabilities in mathematics. As noted earlier, under NCLB schools serving predominately marginalized students were likely to be deemed as failing, have the least access to good teachers, and were stigmatized. The emphasis on testing does not recognize the external factors

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that contribute to testing results which could lead to a labeling that impacts the quality of mathematics that students experience. For students, in schools or subgroups labeled as failing the experience is focused on increasing test scores and for students in schools or subgroups that consistently meet AYP the experience may be more enriching.

When considering an interest-convergence perspective, we must consider whose interests are served under NCLB. If we consider one context in which NCLB was developed, there was public pressure on legislatures for competition in public schools through school choice and vouchers. These pressures lead to increase in public options for schooling, including the increase in charter schools. The interests of proponents of school choice were served. A consequence of NCLB has been the narrowing of the conception of what constitutes a ―good school. Judging schools simply based on standardized test scores had implications beyond the schools themselves. In a study examining property values and schools designated as failing because of NCLB, Bogin and Nguyen-Hoang (2014) found that the "failing" designations significantly decrease home prices and that low and moderate income neighborhoods were negatively impacted. Public schools are primarily funded through property taxes in most areas. This means that in neighborhoods with higher property values, the schools in that area get more resources. Similar to the peer finding of the Coleman report, proponents of school choice supported giving students options to be in "good" schools with the idea that placement in "good" schools would have positive effects. This conclusion ignores the external factors that contribute to failing schools.

A factor that contributed to the creation of the Common Core State Standards (CCSS) was the "known-yet-unacknowledged failure of No Child Left Behind" (Schneider, 2015; p. 20). One complication of NCLB was the lack of consistency among states and what constituted AYP. As a result there was agreement among the Council of Chief State School Officers (CCSSO) that consistent standards were necessary. In 2010 the *Common Core State Standards for Mathematics* (CCSSM) were released by the National Governors' Association and CCSSO. The mission statement for the Common Core makes clear these reforms are emerging from the same interests of college and career readiness by positioning American students to be able to compete in a global economy (National Governors Association Center for Best Practices and Council of Chief State School Officers, 2010)

Nowhere to be found is mention of the gross inequities within society that continue to be reflected in students' educational outcomes. Framing the reform from the position of economic interest, diminishes the needs of learners to focus primarily on the acquisition of mathematics content and practices.

Conclusion

The interest convergence principle provides an intellectual and political frame within which to question the motivating factors of policies and reforms in mathematics education to understand how they are designed to address the needs of marginalized learners. Employing the interest-convergence principles, I raise the following questions: (1) Whose interests are served by policies and reforms in mathematics education? (2) Where are opportunities for convergence?

Whose interests are benefited by policies and reforms in mathematics education? The review of policies and reforms suggest that economic, technological and security interests were the drivers of many policies and reforms. It is difficult to argue against ensuring students' competitive place in the global marketplace. However, a careful look at policies and reforms focused on labeling and identifying the "best and brightest," identifying high achievers, stratifying students based on characteristics, or identifying "failing" schools. Such labeling and identifying determines groups or populations as having merit and others as being deficit. Policies and reforms have typically not attended to or appreciated the social realities and needs of marginalized students in ways that lead to

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improvements in their life circumstances. This critique suggests that marginalized students voices and experiences within a broader context are either missing or are situated within deficit perspectives in mathematics education research, policy, and reform. In fact, patterns over time suggest that marginalized students have experienced mathematics instruction as a focusing on the acquisition of facts over the entire history discussed in this article. Thus, policies and reform have had little to no impact on the type of instruction these children receive.

Where are opportunities for convergence? The stage is set for convergence to occur, given the growing body of research focused on context, identities and conditions and the interests of practices and process in mathematics teaching and learning. There is a growing body of research that positions marginalized students (Berry, 2008; Boaler, 2014; Jett, 2011; Gutiérrez, 2010; Martin, 2000; Noble 2011; Stinson, 2010; Thompson & Lewis, 2005, Walker, 2006). This body of research considers issues of race, racism, contexts, identities, and conditions as variables that impact the mathematical experiences of marginalized. This body of research challenges the dominant discourse and pushes the field of mathematics education to consider sociological, anthropological, and critical theories. It encourages researchers to consider outcomes other than achievement as the primary measure of success. One finding that we find from this research is that educators must create opportunities for students to experience mathematics learning using the resources they bring to classrooms; teachers must know and understand learners' identities, histories, experiences, and cultural contexts and consider how to use these to connect students meaningfully with mathematics. There is a need of policies and reforms that focus on leveraging communities and community-members. Mathematics teaching and learning not only occurs in classrooms but also occurs in other spaces. By leveraging these resources, we situate mathematics teaching and learning as a way to structure experiences that are contextual and provide opportunities for exchange in mathematical ideas. The use of context in mathematics education can help learners to recognize and build upon the cultural and social resources they bring to the mathematics classroom.

Endnotes

[1]I use the term Black to acknowledge the Black Diaspora and to highlight that Black people living in North America have ancestry dispersed around the world. Black learners who attend schools and live in North America are racialized in similar ways regardless of country of origin.

[2]I borrow Latin@ from Rochelle Gutiérrez (2013) who stated that the use of the "@ sign to indicate both an "a" and "o" ending (Latina and Latino). The presence of both an "a" and "o" ending decenters the patriarchal nature of the Spanish language where is it customary for groups of males (Latinos) and females (Latinas) to be written in the form that denotes only males (Latinos). The term is written Latin@ with the "a" and "o" intertwined, as opposed to Latina/Latino, to show a sign of solidarity with individuals who identify as lesbian, gay, bisexual, transgender, questioning, and queer (LGBTQ)" (p. 7).

[3]A dominant culture is one that is able, through economic or political power, to impose its values, language, and ways of behaving. This is often achieved through oppression and political suppression of other sets of values and patterns of behavior.

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