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A “Gap-Gazing” Fetish in Mathematics Education? Problematizing Research on the Achievement Gap

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A substantial amount of research in mathematics education seeks to document disparities in achievement between middle-class White students and students who are Black, Latina/Latino, First Nations, English language learners, or working class. I outline the dangers in maintaining an achievement-gap focus. These dangers include offering little more than a static picture of inequities, supporting deficit thinking and negative narratives about students of color and working-class students, perpetuating the myth that the problem (and therefore solution) is a technical one, and promoting a narrow definition of learning and equity. I propose a new focus for research on advancement (excellence and gains) and interventions for specific groups.

Some researchers have begun to question the usefulness of large-scale assessments of student achievement that identify disparities between middle-class White students and students who are Black, Latina/Latino, First Nations, English language learners, or working class. As a Chicana¹ whose work has been dedicated to equity issues in mathematics education, I share the position that we focus excessively on a single issue—the “achievement gap”—to the exclusion of others. I see it as a moral imperative to move beyond this “gap-gazing” fetish.

Although the term *gap gazing* may seem insulting to researchers of the achievement gap, its negative connotation gives voice to a group of concerned researchers like me. Notably, the term *gap gazing* is being used almost exclusively by faculty of color and people who specialize in equity research (Benjamin Baneker Association, 2005; Rodriguez, 2001). These researchers have a vested interest in broader notions of equity: supporting the mathematical identities, excellence, and literacies of marginalized students. A search in Google Scholar, however, with the words *achievement gap* and *math* produced 8000 hits, suggesting the larger mathematics education community is convinced of the potential benefits of a gap approach and may not be informed about the potential costs of such work.

I want to distinguish between varying forms of gap gazing because some seem more deleterious than others. Most dangerous are analyses that merely document the existence of the gap. Decades of research have shown that certain factors (e.g., class size, per pupil expenditure, teacher expectations, teacher knowledge) clearly contribute to the gap (e.g., Hedges & Nowell, 1999). Deepening our knowledge in this arena is unlikely to advance the cause of marginalized students. Of lesser

¹ *Chicana* is a term that reflects a political stance and refers to persons of indigenous origin who claim their homeland (Aztlán) in the Southwest United States and northern part of Mexico before the U.S.-Mexican border was established.

concern are researchers who are trying to document factors associated with the gap because they have the goal of reducing it. Even those researchers, however, could benefit from carefully considering whether the costs outweigh the benefits. As such, I outline some of the dangers in maintaining an achievement-gap focus in mathematics education research and argue for a new research agenda.

Dangerous Effects of Gap Gazing

At their most extreme, achievement-gap studies offer little more than a static picture of inequities in schools. Because these studies rely primarily upon one-time responses from teachers and students, they can capture neither the history nor the context of learning that has produced such outcomes. And, whereas researchers can highlight the variables most closely associated with the gap (e.g., income, family background), those variables are often not reasonable levers for change in the mathematics education community. Moreover, the cross-sectional nature of most achievement-gap data means that they fail to capture student gains or mobility. Even longitudinal studies that draw upon nested data and chronicle a narrowing of the gap are limited in that they draw primarily on correlations. That is, true “causes” of the gap are extremely difficult to identify, as causality is based upon estimates and inferences that are often limited by omitted variables.

Knowing that the gap has narrowed and widened over the past 2 decades has provided little direction for eliminating the gap (J. Lee, 2002; Tate, 1997). Furthermore, group comparisons from large-scale datasets like those of the National Assessment of Educational Progress (NAEP) implicitly assume that the factors causing differences in achievement *between* groups are the same as the factors causing differences *within* groups. Yet that may not be the case (Lubke, Dolan, Kelderman, & Mellenbergh, 2003). If those factors do not apply under both situations, meaningful policies are difficult to create.

To be clear, the issue is not as simple as quantitative versus qualitative data. Quantitative studies do not have to focus on between-group variance (e.g., gaps between Whites and Blacks). Instead, they can focus on within-group variance (e.g., longitudinal studies of Black students’ achievement or achievement across different contexts). The choice of focus is significant, as one model suggests that success in school is due to individual effects, whereas the other suggests that success can be considered partly a school effect (Kreft & Leeuw, 1995). My earliest research is an example. Using Hierarchical Linear Modeling with a national longitudinal dataset, I identified schools and factors that were associated with large gains in working-class students’ achievement over a 6-year period, little variation between students, and a higher than average number and level of mathematics courses taken in high school (Gutiérrez, 1996, 2000). Eventually, the kinds of equity issues with which I was most concerned compelled me to partner my quantitative data with qualitative data to provide more context.

Regardless of the form of the data, the *theoretical lens* used to view the achievement gap is what supports deficit thinking and negative narratives about students

of color and working-class students. First, an achievement-gap lens perpetuates the myth of greater between-group than within-group variation, a kind of ammunition for accepting the achievement gap as truth (Herrnstein & Murray, 1994). Instead, one could question the racial hierarchy of ability in mathematics (Martin, 2006, 2007). Research on the malleability of intelligence (e.g., Aronson, Lustina, Good, & Keough, 1999) and problems with testing (e.g., Gierl, Bisanz, Bisanz, Boughton, & Khaliq, 2001; Wiliam, Bartholomew, & Reay, 2004) suggest that this hierarchy is socially constructed. Moreover, most people are unaware that the achievement distributions for Latina/Latino, African American, and European American students are highly overlapping.

Second, an achievement-gap lens accepts a static notion of student identity (as quantifiable in terms of race, class, gender, language, etc.) and ignores the multiple identities and agency of students. Third, the lens sends an unintended message that marginalized students are not worth studying in their own right—that a comparison group is necessary. Such a framing further engrains whiteness and middle-to-upper income as a norm, positioning certain students and their cultures as deviant. Fourth, the lens places groups in opposition to each other: one's gain is the other's loss, potentially fueling insecurities among White and middle- or upper-income families when the gap narrows. Fifth, *gap* (like the term *urban education*) serves as a safe proxy for discussing particular kinds of students without naming them.

It is not the gap but rather specific populations with which we are really concerned. There are many gaps we could choose to focus on that we do not (e.g., the White-Asian achievement gap, the monolingual-bilingual gap with respect to language proficiency, the opportunity gap). For example, Hilliard (2003) argues for focusing on a gap between current achievement for Blacks and excellence. Rarely do we acknowledge that even our highest performing students may not model the excellence we want (Boaler, 1997). In fact, a drive for excellence, not parity with Whites, is at the heart of most programs that have produced substantial gains in marginalized students' learning (e.g., Triesman, 1992). Current gap studies in mathematics education allow researchers to talk about, and unconsciously normalize, the "low achievement" of Black, Latina/Latino, First Nations, English language learners, and working-class students without acknowledging racism in society or the racialization of students in schools (Darder & Torres, 2002). Although some measures of student progress are necessary, it seems irresponsible to continue to frame achievement primarily from a gap perspective.

Gap gazing also perpetuates the myth that the problem (and therefore solution) is "technical." Most studies attempting to identify factors associated with the achievement gap, and therefore potential levers for improvement, are overly focused on tangible characteristics or behavior: teacher knowledge, pedagogical moves, computer use (Gutiérrez, 2002b). Reports of such studies suggest that a better list of good teaching practices is all that is needed to improve learning for *all* students (Bartolomé, 2003). These reports tend to avoid discussing such topics as unwillingness to invest in quality education, overworked teachers, high-stakes accountability, lack of meritocracy, and larger social factors (Ladson-Billings, 2006;

Lipman, 2003). Yet discrepancies in scores on standardized achievement tests mirror discrepancies in opportunities and life chances that students from different backgrounds experience in their everyday lives. Another danger in gap studies is they are generally related to narrow definitions of *learning* and *equity*. Most professionals would agree that mathematical proficiency constitutes much more than can be easily measured on standardized tests (National Research Council, 2001). Yet, gap studies tend to be based on measures of basic skills mastery. I am not advocating an elimination of research on achievement, but I would prefer a greater emphasis on advancement. As noted above, I study settings in which students of color and working-class students have made considerable gains or have achieved excellence while in school. *Achievement* as defined by standardized tests has been one part of my selection criteria and analyses (Gutiérrez, 1996, 2002a, 2007b). My concern is that a gap focus ignores broader notions of mathematical literacy: mathematics for use beyond school, how well students are being prepared for college, and mathematics as a tool to analyze society and to solve problems of importance in one's life. See, for example, Martin's (2007) description of *literacy for freedom*, Gutstein's (2006) distinction between *functional literacy* and *critical literacy*, Boaler's (2006) notion of *relational equity*, the National Council on Education in the Discipline's (2001) focus on *quantitative literacy*, and Keitel and Kilpatrick's (2005) push for *common sense* in mathematics education.

Gap studies tend to address only the first two of four dimensions of equity that I have outlined elsewhere (Gutiérrez, 2007a):

- *access* (resources available to engage with quality mathematics)
- *achievement* (standardized test scores, participation rates, math pipeline)
- *identity* (maintaining cultural/linguistic/familial connections)
- *power* (agency to affect change in school or society)

In fact, few studies using large-scale data sets move beyond issues of access and achievement to capture broader notions of mathematical identity or power. In that sense, such research can distract us from other important equity goals. Because it can force some students to assimilate, and because White student achievement levels do not necessarily mean "excellence," even the absence of an achievement gap does not signal equity (justice) in mathematics education. Ideally, every student should see herself or himself reflected in the curriculum, as well as learn about others. A single curricular activity might serve as a "mirror" for some students while opening up a "window" to a different world for others (Gutiérrez, 2007a). For example, attending to social justice issues might offer a mirror for students who have been marginalized by society and simultaneously serve as a window for students who benefit from the status quo. The goal should not be finding those activities that best fit the identities of a given student population in an essentialistic way but rather striking a balance between the number of windows and mirrors provided to a student. One's *stance*, not superficial attention to the four dimensions, is critical.

Addressing issues of identity and power is important for decentering the underlying assimilationist perspective in many mathematics education policy docu-

ments. That is, there is little recognition of the linguistic and cultural resources that marginalized students bring to the mathematics classroom or to the discipline of mathematics. Take the example of Latinas/Latinos. Although approximately 15% of U.S. students are Latina/Latino, and 40% of those were born outside of the United States (Pew Hispanic Center, 2006), we have little understanding of their schooling experiences. Without an adequate knowledge base, we treat such students as blank slates, ignoring potential new strategies, conceptual understandings, or unique algorithms that they could offer a U.S. mathematics classroom (Gutiérrez, 2007c). With respect to language, 2000 was the 1st year in which the NAEP included data on English language learners (ELLs) (O. Lee, 2005). Even then, the data from ELLs were separated from the rest of the data, combined with data from students with disabilities, and eliminated from the NAEP highlights so that the results could be compared with those from previous analyses. Combined with the fact that mathematics tests use complex or confusing language that fails to properly measure the full potential of ELLs (Abedi & Lord, 2001; Boaler, 2006) and that assessment accommodations are not clearly understood or followed by practitioners (O. Lee, 2005), the results we have for ELLs are potentially skewed. A greater focus on Latinas/Latinos and ELLs in learning contexts is important for understanding their needs, moving beyond stereotypes, attending to their strengths, and countering the negative image that is offered by standardized test scores and group comparisons alone. This focus is needed for other marginalized groups as well.

Furthermore, the framing of mathematics achievement in educational research assumes a kind of individualistic accomplishment, thereby attributing a lack of achievement to individual failure. We do not talk about complex learning environments as “achieving.” Yet that is exactly what engaging contexts, not individual teachers or individual students, accomplish (National Research Council, 2004). Although well intentioned, researchers focusing on the achievement gap may unwittingly tie us to narrow notions of learning and equity.

Educational research generally (Ladson-Billings, 2006) and mathematics education research more specifically (NCTM Research Committee, 2006, 2007) are viewed by outsiders as a somewhat self-absorbed process that accepts a loose coupling between research and practice. At the most basic level, gap gazing further supports the perception that research for the public good—to affect the lives of teachers and students—is not our highest priority. Our reputation is at stake. We cannot afford to document the current state of affairs without trying to intervene.

If Not “Gap” Analyses, Then What?

As mathematics education researchers, we need to ask ourselves what we already know and understand about equity. What further needs to be understood? How can it best be understood? I remain unconvinced that we need to know more about group comparisons, especially when those comparisons construct some students as “failures” relative to other groups or maintain a relatively low bar for achievement. There is a significant body of literature on excellence in mathematics for Black,

Latina/Latino, and other marginalized students that needs to receive greater attention. Instead of an achievement-gap lens, I suggest a research agenda that focuses on advancement, on excellence, and on gains within marginalized communities. By *excellence*, I mean high performance on standardized achievement tests and broader notions of mathematical literacy (e.g., Education Trust, 2001; Gutiérrez, 1996, 2002a; Gutstein, 2006; Kitchen, DePree, Celedón-Pattichis, & Brinkerhoff, 2007). By *gains*, I mean significant growth in student achievement over time (e.g., Charles A. Dana Center, University of Texas at Austin, 1999; Education Trust, 2005). A focus on excellence is important for countering the commonly held belief that successful learning environments and their associated student outcomes are nearly impossible to create for all. A focus on gains is important for informing how we might build more such contexts for learning. Of course, a focus on excellence alongside gains is important to avoid a false sense of security in seeing student scores increase if that increase does not also accompany a shift in one's relative position in society.

Overall, I would suggest the following:

- Less research that documents the achievement gap
- Less research that identifies causes of the achievement gap
- Less research that focuses on single variables to predict student success
- More research on effective teaching and learning environments for Black, Latina/Latino, First Nations, English language learning, and working-class students, plus richer descriptions of those environments, including their origins and development
- More focus on making that research accessible to and usable by practitioners
- More intervention work (e.g., Atweh, 2004; Skovsmose & Borba, 2004), including professional development and scaling up

My call for a move away from gap gazing and toward more contextualized and intervention studies is similar to NCTM's (2000) call for a move away from procedures and memorization toward more problem-solving and inquiry approaches. Just as NCTM's goal is not to completely eliminate the basics, I do not want to completely eliminate gaps analyses. Instead, both NCTM and I want to *decenter* what has come to dominate practice. If we are serious about addressing equity in mathematics education, we must develop a more balanced approach for the future. A focus on advancement and the context of learning can serve as a humanizing tool in mathematics education research.

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