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A Note from the Editor

Several years ago, a group of graduate students in Mathematics Education at The University of Georgia fashioned an informal discussion group in response to the missing dialogue evident in our array of coursework and research projects. As we studied mathematics, research, and the teaching and learning of mathematics, we found an overwhelming silence on issues related to equity and social justice in the context of mathematics education. Or, as we may prefer to have seen it, the silence was on the teaching of mathematics in the context of education for equity and social justice.

Of course we learned much from each other—the resources we shared, the papers we wrote, the research we conducted, the seminars we developed, the courses we ran. The group grew and evolved, both in members and in ideas. But more important than these knowledge artifacts were the energy of collaboration, the fraternity of togetherness, and the community of shared commitment. The bonds that developed among these graduate students are what will be remembered from our schooling. This monograph, graciously published by our student organization—Mathematics Education Student Association (MESA)—is one more opportunity for our maturing discussion group to share this work with our peers.

This monograph is published amid the tragedies of Hurricane Katrina, forever disrupting lives of the people of the Gulf Coast—and hopefully forever disrupting the souls of the American public. A black man selling recordings of famous African-Americans on the streets of New York made a damning observation on September 1, 2005: "Blacks ain't worth it, New Orleans is a hopeless case" (NY Times, September 2, 2005). Although this comment was about inadequacies of the planning and the reaction in New Orleans, his message speaks to the state of the American conscience. Paulo Freire observed a decade ago in *Letters to Cristina*, "At no time previously have we been so bold as to express our racism". His observation, repeatedly manifesting itself in discussions of the hurricane response, was apparent in the voice of the Federal government: "…we're seeing people that we didn't know exist…" (Mike Brown, head of FEMA, on Newshour with Jim Lehrer, September 1, 2005). As a nation, our current state—in whatever sort of civil rights movement we are a part of—is to not see race, to blind ourselves to it, to ignore it (cf. the work of Eduardo Bonilla-Silva). Uglier yet is that we attempt to wash our hands of our racism, classism, sexism, by paying it away with our monetary contributions to these 'poor souls'. The blood of our colorblind racism will not wash off our hands; throwing the dog a bone may make us feel better and brighten that dog's day, but that dog remains a dog in our perceptions and in our relations.

I suspect the observations of the New York salesman may be pertinent to our educational system. For many of our students, families, and fellow citizens, we act, uncritically, as though they just 'ain't worth it'. Maybe the current noise in the system, such as *No Child Left Behind*'s unapologetic spotlight on differential attainment by race and the emerging mantra of *Mathematics for All,* will have lasting effects. But for as long as we continue to throw bones in order to subdue the barking dog of educational inequity, the structures of mathematics education will perpetuate the persistent iniquities we have known to exist for decades (and in fact throughout the history of American education).

As you read these papers considering these persistent iniquities, papers that are essentially reflections on our experiences in Mathematics Education, please keep in mind that none are solely the work of individuals. So many people influenced the ideas and opportunities for experiences that shaped these products, an appropriate distribution of thank you's or references would forever be inadequate. In this Editor's note, I have been somewhat liberal in speaking for each of the authors presented here—I hope they don't take offense. Please know my words are my own, and while my colleagues have influenced them, they bear no responsibility for what I have written. Enjoy these three articles. We hope they challenge you to think anew, and possibly to think differently, about a mathematics education challenged by a goal for equity.

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Looking Critically at Teachers' Attention to Equity in their Classrooms

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Ensuring that all students are afforded high quality education is a task given to teachers under standards documents provided by professional organizations such as the National Council of Teachers of Mathematics and the National Board for Professional Teaching Standards. Falling under the generic title of equity, paying attention to the achievement of minority students—especially those historically underserved by schools—is required for good teaching. However, teachers are often left to define what equity means. In this study, we investigated how two National Board Certified Teachers defined equity and how they attended to it in their classrooms. We further explored how issues of race and socioeconomic status interfered with their attempts at providing equitable classroom experiences for *all* students.

The contents of this article were developed under a grant from the Department of Education. However, those contents do not necessarily represent the policy of the Department of Education, and you should not assume endorsement by the Federal Government. Drs. Peg Graham, Steve Oliver and Nicholas Oppong are the co-principal investigators.

Beginning in the nineteen eighties, national interest in ensuring the success of all students, with special emphasis on those students who have historically been underrepresented in mathematics, science and technology, prompted national educational organizations to address the issue of achievement disparities. In 1989, the National Council of Teachers of Mathematics (NCTM) published the *Curriculum and Evaluation Standards for School Mathematics*. This document's main goal was to provide standards for improving the mathematics teaching and learning of all students in U.S. schools. Within the document, NCTM made special mention of the need to improve the educational experiences of those groups of students who have been historically underserved and less represented in professional careers in mathematics and science, such as students of color, students of low socioeconomic status, and women.

The extent to which the creation of such standards would actually work to improve the educational conditions of historically underserved students was questioned. Apple (1992) suggested that the writers of the 1989 *Standards* did not go far enough in their attempt to ensure better mathematical learning experiences for underrepresented students. Apple argued that critical thinking on issues of race, gender and class was needed to ensure that teachers taught for the success of all students. Teacher reflection on the importance of these issues was missing from the documents. Apple said:

> Little is said about how we might prepare our future teachers to do this [reflection]. Thinking critically is not necessarily a natural occurrence. It doesn't automatically arise simply because one is told to look for problems. Rather, such an awareness is built through concentrated efforts at a relational understanding of how gender, class, and race power actually work in our daily practice and in the institutional structures we now inhabit. (p. 418)

That is, simply pointing out to teachers that a problem exists with respect to the educational experiences of such students would never be enough to fully solve the problem. To truly enact change, teachers need a deeper understanding of the ways in which race, class, and gender relate to the everyday practices of teaching and to schooling, in general.

In 2000, NCTM updated their standards in the publication *Principles and Standards for School Mathematics*. This time, educational inequities between majority and minority students were discussed in more detail under the *Equity Principle*, and NCTM defined equity more explicitly for the mathematics classroom.

> Making the vision of the Principles and Standards for School Mathematics a reality for all students, pre-kindergarten through grade 12, is both an essential goal and a significant challenge.

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> Achieving this goal requires raising expectations for students' learning, developing effective methods of supporting the learning of mathematics by all students, and providing students and teachers with resources they need.… The vision of equity in mathematics education challenges a pervasive societal belief in North America that only some students are capable of learning mathematics. This belief…leads to low expectations for too many students. Low expectations are especially problematic because students who live in poverty,… females, and many nonwhite students have traditionally been far more likely than their counterparts in other demographic groups to be the victims of low expectations. (pp. 12–13)

Distinguishing between equity and equality as identical instruction, NCTM suggested that "reasonable and appropriate accommodations be made to promote access and attainment for all students" (p. 12).

Though equity was now a major principle in improving mathematics education, the importance of teacher sensitivity to the roles that race, class, and gender play in education was missing. Similar to Apple's (1992) critique of the earlier document, NCTM still did not address the fact that without teachers' critical reflection on issues of race, social class, or gender, teaching for equity made no sense. As Allexsaht-Snider and Hart (2001) said, "Teachers' knowledge of mathematics, their preparation to teach mathematics, and their beliefs about and skills for teaching diverse students are all aspects of equitable instruction" (p. 94). That is, teachers' beliefs and understanding of the historical and social context surrounding the education of students from minority populations must also be part of the equation.

Similar to NCTM, the National Board for Professional Teaching Standards (NBPTS) created a comparable set of standards defining those teacher qualities and qualities of teaching that define "accomplished" mathematics teaching (2001). These standards were developed both to reward teachers who exhibit accomplished teaching, as well as to improve teaching and consequently student learning. In the NBPTS standards for Adolescence and Young Adulthood/Mathematics, commitment to equity and attention to diversity were integral parts of the definition of accomplished teaching of mathematics. In the second of twelve standards of accomplished teaching, under *Equity, Diversity, and Fairness,* NBPTS defined what they meant by equity. They said:

> Accomplished mathematics teachers are dedicated to meeting the needs of an increasingly diverse student population. They confront issues of diversity proactively to promote academic and social equity. They actively and positively challenge sexist, racist, and other biased behaviors and stereotypical perspectives, including those directed toward various ethnic groups, regardless of the source. They are keenly aware of the historical perspectives and biases that have created social and academic barriers for students, and they work to remove these obstacles. They maintain high expectations for all learners regardless of gender, race, socioeconomic class, or previous experience. They ensure that their students receive equal opportunities to learn and advance in mathematics, and they act to dispel the notion that not all students are capable of learning mathematics. They consistently communicate their respect for all students and their belief that all students can learn. By example and guidance, they help students learn to treat one another as valued members of the learning community. (p. 11)

In the NBPTS document, equity includes the necessity of teachers' awareness of race, class, gender and how these social stratifications have historically had implications for student academic success. NBPTS went a step further than NCTM's suggestion that teachers be aware of issues of equity. Through their certification process, NBPTS asks teachers to reflect on what this equity-focus standard means and what it implies for their teaching. Candidates for National Board certification must demonstrate through their portfolio entries how they attend to issues of equity and diversity in their classrooms. While incorporating reflection on race, class, and gender as part of the certification process for teachers, the question still remains, do the NBPTS standards and process go far enough in their commitment to equity to actually ensure the improvement of teaching and learning of historically underserved students? Though National Board Certified teachers may be aware of the need for equitable teaching and have reflected on such awareness, have they done so in the critical way that Apple (1992) has called for? Do they truly have a "relational understanding of how gender, class, and race power actually work in our daily practice and in the institutional structures we now inhabit" (p. 418) that Apple says is needed for true critical awareness? In this study, we investigated the ways in which teachers' lack of awareness about the relevance of race and class to their teaching contributes to teaching practice that falls short of being equitable as described by NBPTS. Through interviews with two National Board Certified teachers, we explored the ways their own ideas about race and class allowed them to

comfortably draw deterministic conclusions about what their students can and cannot do.

This study is set against an understanding that teaching is a complex job. During any given segment of the school day, teachers must decide what pedagogical actions must be taken to ensure that their students are successful in learning. Given the broad nature of the language used to point teachers' attention to the idea of equity, teachers are left to make decisions about what that means for their classroom. Complications arise especially when teachers hold views that are culturally biased. These views often counteract their attempts at truly creating an equitable learning environment (King, 1991). Secada (1989) suggested that "systematic inquiry into how teachers of mathematics interpret their practices as linked to notions of equity is needed" (p. 51). To make this point, Secada gave the plausible example of teachers who can justify giving more attention to higher-tracked students based on notions of fairness. He summarizes these teachers rationale, "Why waste scarce resources on students who will not profit from them when there are others who need the help and will, in fact, make good use of the resources?" (p. 51). Secada's example suggests that while teachers may be seeing their teaching as equitable, their actions might not be what the writers of the standards documents had intended.

To truly understand at a classroom level how equity in mathematics education is or is not being attained, we decided it was necessary to investigate how teachers interpret the call to ensure mathematics for all, and especially for students who have historically been underserved by schools. Keeping in mind Apple's (1992) urging that teachers need an awareness of the ways in which race, class, and gender play a major role in daily life, the purpose of this study was to explore how teachers' attention or lack of attention to issues of race and class influence their daily practice of teaching as well as their ability to be equitable. Prior to reporting directly on the study, we will clarify our working definition of equity and the notion of equality in the socio-cultural context.

What Do We Mean by Teaching for Equity?

Equity has many different meanings for different people. In the research literature on equity in mathematics education, we can find several different approaches to defining the term. To describe the concept of gender equity, Streitmatter (1994) distinguished between two ways of thinking about equity—equality versus equitable. Equity as equality is about a concern with assuring that all students (in this case, both boys and girls) receive equal opportunities from the start. That is, equal access to instruction, curriculum materials, and opportunities to share in class. Equity in terms of equality is focused primarily on the starting point of education for students. Once students have an equal educational beginning, this position argues that the outcomes—be it scores on achievement tests, courses taken, or college majors—will be based on student individual differences. The key for the equality approach to equity is to level the playing field from the outset for students.

Streitmatter contrasted this idea of equity based on equality with an equitable-based notion of equity. The foundation for this second approach to equity lies in the belief that some groups of students have been continuously disadvantaged in the educational system. Final outcomes are the primary issue for this type of equity. Fully aware that certain groups of students do not achieve at the same level as others, teachers in this framework might recognize that ensuring equal opportunities for all students might not ensure equal outcomes for marginalized students. Teachers might provide more for these students to ensure that they have opportunities for success. Student differences and motivation still play a role in the equity-as-equitable framework; however, the main idea behind such an approach is that the teacher should try to compensate for societal biases by providing minority students with additional needed resources.

Streitmatter (1994) suggested inherent danger in both approaches. Equality-based equity does not take into consideration the larger social biases that exist. However, approaching equity in the second manner by trying to make things equitable might result in reverse discrimination, especially if teachers over exaggerate the relevance of societal biases to the classroom. Streitmatter found that in her study of seven teachers concerned with gender equity, six of the teachers held a concept of equity based on the first definition, equity-as-equality.

This two-way approach to gender equity mirrors a similar discussion about defining equity that takes place within the larger context of the identification of standards. While different definitions of equity are offered, the approach described by both NCTM (2000) and NBPTS (2001) is based on an equitable notion of equity—the second definition. That is, both groups differentiate between the equity-as-equality and equity-as-equitable notions of equity, and both call for a greater concern with outcomes in order to ensure the success of all students, aligning themselves with the equitable notion. Both standards documents suggest

that equity does not necessarily mean equality and urge teachers to provide appropriate resources and support for students based on need.

However, while both documents, NCTM (2000) and NBPTS (2001) took a definite stand on what they meant by equity, neither suggested a need for teachers to look critically at the larger historical and social context of race, class, and gender. Secada's (1995) critique of the research community for the merely symbolic meaning that the word equity has come to take on applies here as well. He described how the term equity is often used to represent all issues related to the education of diverse groups of students. Secada said that in the research community the term equity "signals the belief that there is one single, monolithic issue to be addressed, and that what applies to one equity group can transfer to other groups…" (p. 149). He argues that the complexity of what it means to equitably provide education for minority groups of students is lost in a general discussion of issues of diversity and equity. Most good teachers would probably say that they are supportive of all students being successful and that they work hard to provide students with what they need for success; however, the complexity of such a task is glossed over by suggesting that equity is only about good teaching and good intentions. Streitmatter (1994) articulated this point, saying:

> Gender equity and related goals can be thought of as working to enhance the aspirations, achievements, talents, and interests of all students independent of their gender (New Pioneers, 1975). If asked, most teachers would report that they do their best to meet this general goal. However, approaching gender equity with such a broad, vague statement may result in business as usual, that is with gender issues not being addressed critically by the teacher. In order to understand how gender equity might work for you in your classroom, it is important to think through the broader concept of equity first, then carefully examine how it can be implemented through your teaching. (p. 7)

While Streitmatter focused explicitly on gender equity, the same claim can be made for the need for critical reflection when approaching racial or socioeconomic status (SES) equity as well. In particular, teachers' critical thinking about issues of equity in the larger society is crucial to their truly giving action to the lip service that often surrounds discussions of equity. This critical thinking about issues of equity in a broader sense includes understanding societal messages about race and class and how those messages permeate our beliefs and consequently our ways of interacting with each other.

Societal Messages about Race and Socioeconomic Status

Teachers are not immune to the societal messages about race and social class that influence most Americans' perceptions of diversity. These messages influence their ways of operating with diverse people. Teachers, who are more and more likely to come into contact with students of races and SES status different from themselves (Howard, 1999), enter their classrooms with preconceived ideas about these differences (Reyes & Stanic, 1988). In the following section, we will discuss literature describing the different societal messages about race and SES. We do not focus on gender equity because both teachers in our study exhibited a critical awareness of the problems associated with females and mathematics. They also worked to ensure that girls succeeded as well as boys. In this respect, we did not see gender equity as problematic for these teachers and so chose to focus our analysis strictly on race and class, as the teachers' demonstrated less critical thinking on these topics.

Colorblindness—The American Way

Messages about race at work in the larger society influence the attitudes of teachers toward their students. Since the Civil Rights Era, the stance taken by many White Americans is based on the perceived meaning of Martin Luther King's *I Have a Dream* speech—that to see race is to be racist (Bonilla-Silva, 2001). Any admittance to distinguishing with respect to race is to suggest differences among people based on race and thus, racist. However, the reality is that through race, we as Americans, consciously or not, identify ourselves and others (Omi & Winant, 1994). Adhering to a colorblind racial ideology often safeguards peoples' actions and words toward people of color from being considered racist. Bonilla-Silva (2001) offered a framework for what he calls the ideology of "colorblind racism." A racial ideology encompasses more than just beliefs, it "consists of the broad mental and moral frameworks, or 'grids,' that social groups use to make sense of the world, to decide what is right and wrong, true or false, important or unimportant" (p. 62). Crucial to Bonilla-Silva's framework is the rejection of racism being individual and afflicting only a few people here and there. Instead, "racial ideology has a collective nature and thus affects the consciousness of all actors in society" (p. 61). This does not mean that people are passive

actors whose beliefs are held hostage by this racial ideology. Instead, they often adopt and purport such racial ideology as it helps to maintain their status as part of the majority. Bonilla-Silva offered that colorblind racism has been and continues to be the racial ideology that permeates society post-Civil Rights. He argues that colorblind racism "has emerged to support and reproduce the new racial structure of the United States" (p. 137).

Schofield (1986), in her study of colorblindness in an integrated elementary school, provided a description of how colorblindness operated in a school setting to the disadvantage of the students of color. While colorblindness is seen by many as inherent to egalitarianism, Schofield illustrated how this ideology functioned to the detriment of students of color in the school being studied. One way in which colorblindness played out to the detriment of students of color is referred to by Schofield as *increasing teachers' freedom of action*. She described this as the consequential simplification of life when one takes race out of the picture. In her study, Schofield gave the example of a teacher who rigged a student council election so that a white student, characterized by the teacher as responsible, won the election over a black student who was deemed less responsible. The teacher insisted that the decision to rig the election was based solely on perceived differences in responsibility. Schofield confessed that she felt that the race of the candidates did not consciously enter the mind of the teacher. In the same way, the teacher did not think about the ramifications to the larger school such as how that decision changed the racial makeup of the student council. Schofield said,

> The failure to consider such issues clearly simplified the decision-making process because there was one less item, and an affect-laden one at that, to be factored into it. Related to this, such a colorblind approach increased teachers' freedom of action because actions appeared acceptable if one were to think about them in a colorblind way often appeared much less acceptable from a perspective which is not colorblind. (p. 247)

That is, while the teacher may not have specifically thought about the role that the race of the student played in her decision to rig the election, the notion of colorblindness kept her from having to think critically about both the incident and the ramifications of rigging the election to favor the White student. Colorblindness protects people from having to look at themselves as racist or perpetuating racist ideas. If they adhere to the larger social message, that race no longer has a role in American society then they are not forced to address their views toward people of color or how those views affect their interactions.

Messages about Low Socio-economic Status

Using SES as a means of categorizing people is often seen to stand in strict opposition to building Nationalism (Mantsios, 2001). However, that class is an invisible distinction is absurd; prejudice toward people of the lowest socioeconomic status is well documented. For example, Cozzarelli, Wilkinson, and Tagler (2001) in their study of attitudes toward the poor found that internal factors such as lack of effort, laziness, drug use, and low intelligence were the most prominent reasons given for why poor people are poor. On the other end, external factors such as discrimination, educational disadvantages, and low wages were rarely seen as reasons for poverty. Crime is associated with poorer neighborhoods in America (Gans, 2001), from which emerges the lampoonish image of the suburban couple rolling up the windows to their car while driving through one of America's "dangerous" cities. Jobs associated with the lowest socioeconomic status are deemed menial, and thus devalued, despite their contributions to both the community and economy.

Perhaps the most detrimental label attached to poor America is their status as deviant from what is considered normal as defined by middle class America (Gans, 2001). As more and more people, even those who are economically not, think of themselves as middle class (Frankenstein, 1995), the ideology attributed to the middle class has come to, for many Americans, represent the norm. Further, although discussion of class differences is considered gauche, both the media and politicians talk openly about "the middle class" (Mantsios, 2001). Public references to the middle class, "appear to be acceptable precisely because they mute class differences…are designed to encompass and attract the broadest possible constituency…[*and*] avoid any suggestion of conflict or exploitation" (p. 169). That is, middle class has come to represent average, or the normal American, and those who do not make it into this class are considered outside of the norm. Those who live below the middle-class line are considered, by their social and economic positioning, to not have access through their communities to the esteemed norms of living as defined by middle-class America (Gans, 2001). Gans suggested the dangers in such messages:

> The behavioral definition of the underclass, which in essence proposes that some very poor people are

> somehow to be selected for separation from the rest of society and henceforth treated as especially undeserving, harbors many dangers—for their civil liberties and ours, for example, for democracy, and for the integration of society. (p. 82)

Marginalizing people with lower SES further stratifies society. Lemieux and Pratto (2003) attributed most existing poverty, and the unwillingness of wealthier people to share resources with those who are living in poverty, to the prejudices that exist toward poorer people. Prejudice "serves as a barrier that helps to prevent powerful people from entering into close relationships with members of the stigmatized groups or needy others" (p. 149). Further, "prejudice against the poor also increases the likelihood that exchanges that do occur will maintain inequalities, because prejudice can reduce the value of both poor people themselves and what they have to offer" (p. 149). Separation from wealthier classes creates disconnects between the poor and the middle and upper classes. This separation on top of the stigmas associated with being poor "help legitimize discrimination against and exploitation of others" (p. 149).

Schools, where mixtures of students of different socioeconomic status must be in class together, work together, and socialize, are not immune to the segregation among classes. NBPTS (2001) suggested that teachers should model behavior that does not perpetuate such segregation. They go on to suggest teachers should treat all students with respect and look for what they have to offer given their cultural and social background. If not, schools act as an agent for rather than against perpetuating the divide between socioeconomic classes that exist in larger society.

While teachers might have a propensity for working for equity in their classrooms, we have demonstrated above that their attempts will be inadequate unless such a focus is accompanied by a critical understanding of the roles race and class play in our society, as well as by reflection on how societal messages about people of color and or low SES influence their approaches to dealing with diversity (Apple, 1992; Reyes & Stanic, 1988; Streitmatter, 1994). In what follows of this paper, we describe how two teachers who, given their National Board status, have reflected on and successfully articulated to the NBPTS their concept of equity for their classrooms. Through our interviews with these teachers, we gained insight into how, even with a good grasp on what equity means as defined by NCTM (2000) and NBPTS (2001), these teachers still fell short of actually being equitable toward all of their students. In the following section, we describe how we designed and conducted our study.

Research Design

The purpose of this study was to understand how two National Board Certified mathematics teachers defined equity, and to understand how their understanding of equity influenced their ability to create equitable learning experiences for their diverse student population. We do not intend to generalize from these two cases. It was our purpose to investigate the extent to which our participants being able to articulate their beliefs about equity actually resulted in equitable classroom experiences for all students. We adopted a method described by Schofield (1986) in her study of a colorblind ideology in a school setting. She said:

> In choosing a site for the research, I adopted a strategy that Cook and Campbell (1976) have called generalization to target instances. The aim was not to study what happens in a typical desegregated school, if such an entity can even be said to exist. Rather, it was to explore peer relations under conditions that theory suggests should be relatively conducive to positive relations between blacks and whites. (p. 233)

Similarly, our goal was to explore a situation where two teachers with seemingly reflective definitions of equity still have trouble with respect to holding high expectations for all students. We did this by first describing their espoused definitions of equity. We then used instances from their practice to support the consistency between their teaching and their proclaimed definition. Finally by describing critical incidents in their practice, we illustrated our conclusion that their teaching fell short of being truly equitable with respect to their minority students.

We are not interested in generalizing toward all teachers; rather, we offer these cases as examples of how knowing and being able to articulate what equity should be does not necessarily result in equity. In doing such we hope to point attention to the inadequacies in merely providing teachers with documents that suggest the importance of equity with the end goal of improving education for minority students.

The specific research questions investigated were:

1. How do National Board Certified Teachers (NBCTs) define equity?
2. How do NBCTs attend to equity in their classrooms?

The Participants

In this presentation of our research, we focus specifically on the data collected about Annette and Tammie, two high school mathematics teachers who were both part of a larger study on NBCTs done at a large southeastern university. These two teachers were chosen because in interviews with them, we felt that both seemed reflective on and committed to equity. They were also chosen for this study because of the diversity in their schools. We felt that choosing teachers who taught a diverse group of students would offer insight into not only how they were thinking about equity in terms of teaching students from different races and socioeconomic backgrounds, but also what they were actually doing in their classrooms with these students. Further, as both teachers were mathematics teachers, we felt that given the extreme attention surrounding the achievement gap between Black students and White students in mathematics, these teachers might have had more experience with achievement disparities and other matters of equity.

Annette's school. Annette is a National Board Certified middle school mathematics teacher in an "urban fringe" (US Census Bureau, 1997) school in the southeastern U.S. Throughout her teaching career, Annette has received accolades for teaching besides her National Board Certification. Annette described the school in which she is teaching as changing demographically. She says of her school:

> Our school has gone under major changes since even from 2002. Right now our minority students are the majority. We're probably at 32 percent Caucasian, 16 percent Hispanic, 3 percent Asian and then the rest of the children are either African-American or mixed race.

In her school district, where *Algebra for All* is the mantra, Annette teaches both algebra and pre-algebra courses to eighth graders. Annette discussed her feelings that not all of her eighth-grade students taking Algebra were placed appropriately and that they would most likely have to retake the course in ninth grade. The eighth-grade students in her pre-algebra classes had failed the required exam and were taking seventh-grade mathematics classes as eighth graders. Annette described the demographics of her classes as fairly representative of the school as a whole, although she admitted that the eighth grade pre-algebra classes were only about 12% White even though the whole school was about 33% White. Annette also mentioned that these same eighth-grade pre-algebra classes were dominated heavily by male students.

Tammie's school. Tammie is a NBCT in mathematics at the high school level. She describes her high school as mainly White, middle to upper middle class, and serving a fairly well-educated community. She does acknowledge that there is some diversity with respect to socioeconomic status.

> Our county I would say is very middle class, upper middle class, predominantly White. But it still has a rural flavor to it. So we still have – I call them kind of my country kids. So it's – there's a diversity in that you have a lot of kids who both parents have gone to college, both parents have college degrees and they're professionals. You also have kids whose parents possibly haven't graduated, but they've grown up on a farm setting. So it's a very different kind of feel. So you have those two very distinct groups that are different.

Tammie's school, like most American high schools, proclaims to track according to ability. Tammie teaches classes on both the honors and the regular tracks. While the minority population is small, she acknowledges that the rural students and students of color are often overly-represented in the lower track classes.

Methods

The data sets include surveys and a one-hour interview with each teacher. Both the survey and interview protocol (see appendix) asked questions specifically about defining equity and how the teachers attended to equity in their classrooms. A team of professors and doctoral students collected and analyzed the data. We devised a coding system through a process of open coding, based on the grounded theory method of constant comparison (Patton, 2002). Once the team established and agreed upon a basic set of codes, each interview transcript was coded by two members of the research team, using the qualitative analysis software Atlas.ti (Muhr, 2002) as an aid. As research partners, the authors achieved consensus for how to code each quotation (Atlas.ti's term for a segment of text) as a collaborative effort. The two authors of this paper used the team-developed codes in addition to their own to code the set of data. After each transcript was coded, the pair summarized the highlights in a separate document for the larger team's review.

Analysis

We have organized our analysis of the data into three sections. We begin with a description about Annette and Tammie's definitions of equity and a discussion of how these definitions fit in well with

NCTM's and NBPTS' standards. In the second section, we attempt to show how each of the two teachers describe teaching practice consistent with their ideas about equity. Finally, using their own descriptions of incidents in their classrooms, we illustrate how their lack of critical reflection on race and SES contribute to their maintaining low expectations for minority students and keep their teaching from being equitable. In the first two sections, we attempt to make the case that both Annette and Tammie are both aware and reflective about equity in their classrooms and schools. In pairing their definitions of equity with their actual practice, we hope to illustrate the consistency between what they claim to think about equity and what they actually do. The last section contains data to suggest that regardless of how dedicated they are to providing high quality education for *all* of their students, lack of critical reflection on race and SES allow for inequity to take place.

Annette and Tammie's Definitions of Equity

In line with both NCTM (2000) and NBPTS (2001), Annette and Tammie described a concept of equity resembling Streitmatter's (1994) framework of equity based on outcomes (equity-as-equitable) as opposed to just providing equal opportunities (equity-as-equality). They each made similar comments about understanding that equity might not imply giving equal resources or time to students, but to provide students with the appropriate amount of resources to ensure their success. Annette, who has a background in special education, says that she sees the academic strengths and weaknesses in each of her students. Annette approaches this diversity by making accommodations for students who might require more of her attention or resources. Annette's definition of equity can be summed up as "giving each child the opportunity to succeed as best they can with what they have to work with and making sure that they have everything that I can possibly give them to make sure they do it right." Annette's definition of equity would seemingly fit in well in either a NCTM or NBPTS standards document, an equity-as-equitable position.

Similarly, Tammie's definition of equity is also equitable-based; however, she also demonstrates concern about students having equal access and opportunities. She describes how theoretically all students should have equal access to honors mathematics courses; however, as in many tracked schools, once a student is placed on one track, upward mobility is almost impossible. The process begins in eighth-grade at Tammie's school. Tammie recognizes how some students will have an advantage when it comes to being placed in the higher track especially if their parents have college degrees or higher. To make the situation more equitable, Tammie says that teachers may have to give some students extra support and guidance when it comes to helping them pick courses and move from one track to the other. In this respect, equity is not about giving each student the same amount of support and guidance. Tammie recognizes that the students who do not receive academic support and guidance at home require more from their teachers than those whose parents take an active part in their schooling. This support does not stop once the students gain access to the higher track courses. She says that she continues to provide them with support all the way through graduation. Tammie's approach to equity can be summed up as helping students reach their educational goals, and supporting them through every step of this process.

Tammie and Annette, seemingly right on target with what NCTM and NBPTS require of teachers, see the diversity in their students and both see equity as their efforts to provide students with what they need to be successful. In the next section we describe how they incorporate their definitions of equity into their teaching practice. Through these examples, we hope to show that these two teachers are consistent with what they say equity means to them and what they actually do in their classrooms. In this regard, we feel that they are reflective about issues of equity and about how to incorporate their thinking into their work as teachers.

Equity in Practice

For both Annette and Tammie, giving students what they need for success is the key to equity. For Annette, success is not just a matter of grades but in a feeling of accomplishment. Concerned about some students being intimidated by mathematics, it is important to her that her students feel confident in their mathematical ability. Her concern for student sense of efficacy and her outcome-based approach to equity is illustrated in this excerpt from her interview where she describes her selection process for deciding which students will present work at the board.

> Today, before you came in, we were working on absolute value inequalities.… There are some children that still aren't even understanding inequality.… So the kids did their homework last night, and today what I decided to do is I decided to put a lot of the problems up on the board and then just randomly – well, supposedly randomly call up kids to the board to have them do it. One of the things I tried to make sure I did was those kids

> that I knew didn't get it to start the first couple of problems, I didn't call them to the board. I called those students that I knew from yesterday's instruction had a handle on it.… Well, then by the time I got to the fifth or sixth problem, I started calling on those people that I felt I kind of saw the light go on in their head so that they could go up there and they could show a little bit of confidence and show that they could do it and be able explain to the class. And so I – to me, that's what the equity of the situation is, not so much does everybody get a chance to go to the board, but to make sure that those that can go to the board get up there and feel confident about doing it and able to show off.… And so I think that's the type of equity that I look for and that I think is good for the students, not so much that everybody gets a chance to go up to the board. Because there are some kids that if you put them up at the board, they are going to melt down. And I don't think it's fair.

In this example, the outcome is students feeling successful. To ensure that all students feel confident, instead of calling on every student to go the board, she only picks those that have demonstrated mastery. Annette provided similar examples that illustrate the thoughtful way in which her practice incorporates her definition of equity.

Tammie thinks of outcome in terms of students reaching their educational goals. Equity for Tammie is doing whatever she can do as a teacher to ensure students reach their full mathematical potential. The majority of students in Tammie's high school have college-educated parents. She is aware of the consequences of such diversity; namely that while some students might be getting academic support and encouragement at home, others may not. The following excerpt describes the influence of this awareness on her practice.

> And so I think that's what I see as an equity issue, is that some kids have that at home. Some kids are pushed into that from home, and some kids don't have that support at home. And so, you know, I've got a couple of kids in my concepts class – we have one student in particular and he's an athlete and has a very, very rough home life. And I feel like we're all behind him kind of going you can do this. And he's resisting it right now…and I had to pull him out in the hallway and it's like, you know, you can do this and I know you can, and you're so close to that passing failure mark, you need to be doing this work.... It's an issue of where you need to be and where you're going to go. And knowing that you can do it, we're not going to let you just sit back and not do it.

Tammie goes on to describe that she pushes these students who she feels require more from her. Getting students to where they need to be is the final outcome for Tammie, whether it be onto a higher track mathematics course or graduation.

For both Tammie and Annette, equity is not something they just talk about, rather it seems that they are both reflective about what it means and actively pursue it in their daily work of teaching. Their actions described in the two excerpts suggest that they both understand that equity is not about equality but about providing students with what they need to be successful. Like most teachers, they are concerned about their students' feelings of success, their being challenged adequately, and providing them with enough support so that they will achieve academically. Both teachers are committed to their students and ensuring that they all succeed. They embrace the diversity of their classrooms and incorporate student differences in their teaching practice. However, in the same way that race and SES and the associated societal messages exist outside of the classroom, we found that no matter how blind to race or class and how fair to their students both tried to be, these messages found their way into their classrooms, as well.

Race and SES Interfere with Attempts at Equitable Teaching

In this section we discuss incidents in Tammie and Annette's practice that illustrate that although these two teachers seem reflective about equity and their practice, they fall short of being what NCTM and NBPTS might consider equitable. These descriptions of practice are in the words of the teachers and illustrate how societal messages about race and class seep in to undermine attempts to provide high quality educational experiences for all students.

Basketball and colorblindness. Annette volunteered early on that she is colorblind and that she does not see her students in terms of their race or ethnicity, but only in terms of ability. The ability, she says, is not attached to race. She says, "I really don't look at okay, if you're a black student, you can do this. If you're a white student, you can do this. For goodness sake, I have a little girl from China right now. I don't look at her and go oh, thank God, I got an Asian kid who's going to be great at math." Instead of using race as a signifier, Annette distinguished students in terms of their mathematical ability, a point she repeated several times through the interview. She used the following story to illustrate the magnitude of her colorblindness:

> One of the kids said something about – at the start of the year and this is a horrible story to tell on myself, but I'll tell it anyway. And they said do you remember the black Ashley that you had last year? And for the life of me I'm thinking that it's this kid's last name.… I didn't teach anybody by that name. Well, yeah, you did. She was in your first period class. And I said oh, the girl who couldn't multiply polynomials. And they go yeah. And I said well, her name wasn't Ashley Black. It was Ashley and I said the last name. And the kids are cracking up because they know that this kid is asking me about a black student named Ashley. And I'm like clueless. And I'm not a stupid woman – I'm – you know, I mean I am – without breaking my back, I am pretty smart. And they said no, you know, black. And I said I'm going to tell you something and they all laughed. I said when I think of a student years later, I don't really see the color. I see this one struggled with this. This one struggled with that.

Annette attributed her colorblind approach to race to growing up during the Civil Rights movement. She expressed that she tried to maintain a race-neutral and class-neutral classroom, as well. She gave the example of squelching a group of students' name-calling of another group of students as "rich white girls" saying that that sort of talk had no place in her classroom.

As discussed earlier, for many White Americans, seeing race is often aligned with being racist. For White Americans, the vocalization to not see race is a way of establishing a social assurance that one is not racist (Bonilla-Silva, 2001), especially when racism is strictly associated with imposed segregation. Annette was a child of the Civil Rights era, an experience to which she attributes most of her colorblind mentality. The danger in colorblindness is the *freedom to act* one gains from admittance (Streitmatter, 1994). That is, with a pledge to colorblindness, people are free to act without thinking about both the racist implications and motivations that surround the act. Next, we will analyze one such act that Annette described as having taken place in one of her pre-algebra classes. The pre-algebra classes, as described by Annette, are majority minority with the largest percentage students being Black.

In Annette's pre-algebra and some regular algebra classes, she has students who she describes as having no motivation or not really seeing mathematics as relating to their lives. To motivate these students, Annette tries to appeal to their future aspirations. She says:

> Because I always tell them, I say I can't choose what you're going to be when you grow up. And if you're telling me right now that you're going to drop out of school the minute you turn 16 in ninth grade, that's fine. I'm not going to argue with you. I'm not going to disagree with you.… I want to make sure you know how to balance a checkbook. I want to make sure that when you sign your NBA contract and the guy says ten percent or ten thousand dollars and you say oh, ten percent sounds really good and you have a million dollar contract, you know, you've just thrown away $100,000.

This deterministic comment suggests that Annette knows that her students do not have very bright mathematical futures, yet she wants them to try and to be successful while in her classroom. We might argue that Annette's low expectations for her students' mathematical futures, that is, that they will only use math for figuring out personal finances, are a result of her really being in touch with her students' goals. However, we offer another hypothesis. We argue that Annette's colorblindness allows her to be untroubled by the low future expectations she has for her students, a great many of whom are of color and male. In believing herself as a colorblind individual, one for whom race is never a conscious identifier, Annette is safe from critically thinking about why she would choose the career of a professional basketball player to appeal to her students, a majority of which are Black. Perhaps she said this to appeal to what she believed her students might want for themselves as a future, but behind a veil of colorblindness, she does not have to think of how such statements are based on and reiterate a taken-for-granted assumption that Black people and athleticism are naturally linked (Harrison & Lawrence, 2004). Within a colorblind framework, Annette can use a lucrative NBA career as a way to motivate her students to work hard in her mathematics class. She does not have to think about the role that race plays in choosing such an example, nor, is she compelled to think about the message she is sending out to the Black males in her class who probably already see athletics as the most viable option for a successful future (Harrison Jr., Harrison, & Moore, 2002).

Motivating students to learn is a component of both the NCTM and NBPTS standards documents. However, motivating students through methods based on low expectations for their futures is most likely not the intention. Annette has a priority of providing students with what they need to be successful, such that in this case her desire to motivate her students and maybe to connect with perceived student-interest takes

priority in how the enactment of motivating students takes place. Similarly to the teacher in Schofield's (1986) study, holding on to colorblindness allows Annette to attribute the action to knowing her students and not to any preconceived ideas she might have about race. Further, if she is colorblind, she is not forced to think about the ramifications of sending such a message to her students.

In her mathematics classroom, Annette tries to create this utopia where race and class have no place. However, no matter how much she tries to keep race outside of her classroom, it seeps in. Not addressing the role that race plays in her practice can lead to a dangerous sequence of events that undermine any attempts she might make to ensure high quality mathematics instruction based on high expectations for her minority students.

The country kid. Tammie offers a troubling classroom incident related to a student from the rural part of her county. She refers to him as her "country kid." In this section, we analyze the incident drawing on the literature discussed earlier about societal messages about low SES. While it cannot always be assumed that there is a rigid distinction in economic status between rural students and students from the suburbs, Tammie in her interview suggested a class distinction between the two groups of students. Therefore, we assume that her distinction between the "country kid" and the middle-class students in her mathematics class is more than just one of geography, but one of class as well.

Tammie, like Annette has an equitable, that is outcome-oriented, concept of equity. In an earlier section of this paper we gave evidence to suggest that Tammie recognized the diversity in her students and saw the need to provide those with less parental academic support at home with extra encouragement in school. However, Tammie was not always an advocate for students who did not come from middle-class homes. Tammie, who adopts a more NCTM reform-based approach to teaching mathematics, uses group work extensively in her classrooms. She describes the process of assigning groups as a key part of equity. She wants all students to both feel comfortable and to have equal opportunity in their groups to discuss their solutions. Tammie takes great caution in creating groups that will work well together. She describes a situation in which she had only one rural student in a class with the remainder of the students being from middle and upper middle class families. In trying to place this student for a group project, Tammie discusses her dilemma of finding the right group for this student.

> I have a class right now that's very small. It's only 12 kids and I have one country child and it's hard sometimes when I pair them to do an activity because there are a lot of natural pairs in the class, but there's no natural pairing with him.

Finding the right partner for this student was fueled by her concern for her marginalized students.

> I feel very protective. I think of the kids who would tend to be ostracized by the other kids. And I think I always make sure they're okay. You know, the other kids I feel like that they're going to get along and they'll be fine. But it's those kids that I really want to make sure that they're okay.

Worried about the "country kid" being ostracized for being different, Tammie paired him with a student she perceived as being kind.

> And so the project that we just finished was a container project. They had to construct a container and they had two days in class to do it and they can't do it at home. So it has to be a paired situation. And so, you know, one of the girls ended up getting paired with him for that activity. And, you know, she was very sweet about it. You know, she was like hey, I can do this.

Tammie, concerned that her students' learning could be affected by their comfort in their groups, took caution to create what she felt would be productive groups. This in itself is unproblematic and just suggests that Tammie is very thoughtful about the collaboration that takes place in her classroom. However, what is troubling is her assumption that the "country kid" poses a problem for the other students in her class and in particular for that poor sole who must work with him. The sympathy she feels for his partner is clearly visible in the next passage.

> And so, you know, one of the things I do is I just praised her for it. You know, you're doing a great job. You know, you're doing a great job working with him and y'all are doing a good job as a group. And I think sometimes it helps them for you to acknowledge that I know you're working with someone who's hard to work with, but you're persevering and you're doing it anyway. And I think that's just a life lesson. And that's what I tell them. You know, because I teach at this school doesn't mean that I enjoy working with every other teacher who's in this school. But they're a colleague and I treat them professionally and if I do need to work with them, I'll do that. And that's what you have to do in life.

Tammie describes being concerned that the rural student will be ostracized and so she assigns a partner who she thinks will be tolerant of his differences. In protecting the marginalized student, making every group comfortable, and praising the partner for working with him, Tammie is perpetuating the message that because this student is a "country kid" he somehow does not possess those skills and ways of interacting that are the norm in this school. To punctuate the severity of the incident, assume instead that the "country kid" was instead female and Tammie praised a male student for taking on the hardship of working with a girl who, given her gender, would not be an easy partner with which to work. We would be appalled in the 21st century that someone still held the belief that somehow women are less mathematically capable or more difficult to work with. The message that goes out to at least the "country kid" and his partner, if not the entire class, is that because of his different class status, his behavior is somehow deviant from what is considered normal for the rest of the class, therefore making him difficult to work with.

Teaching students to work with different people is a valuable lesson in our more and more diverse society; however, Tammie seems to be teaching the lesson of *dealing* with diversity as opposed to embracing it, honoring it, or welcoming what others might offer. The NBPTS standards document says that teachers should exhibit behavior befitting for living in a diverse society by being respectful as well as appreciative of all students (NBPTS, 2001). By finding a partner who can tolerate this student from a perceived different social environment from his peers, Tammie is not demonstrating the appreciation for diversity that NBPTS calls for. This is especially crucial given the divide between different social classes that exists outside of school (Gans, 2001; Lemieux & Pratto, 2003). Instead of working against class-based segregation, Tammie in praising the *normal* student paired with the "country kid," is sustaining the idea that separation among classes is justified given that students from a lower socioeconomic status are more difficult to work with.

Conclusion

Annette and Tammie were chosen to participate in this study because of their commitment and attention to equity as well as their status as accomplished teachers as defined by their National Board certification. Both readily described their attention to issues of gender, race, and class. They both said as well as illustrated with examples from their teaching a commitment to ensuring that all students had equal opportunities for success, while understanding that the diversity of their students called for equitable but not equal time, support, and resources. Both teachers probably would describe themselves as equitable. However, while Annette and Tammie both described equity in a way consistent with standards documents, some of the teaching actions they described in their interviews, particularly with both Black students and students of low socioeconomic status, suggested a need for critical reflection on their part about how they are both being influenced by as well as perpetuating social inequities.

As illustrated with the cases of Annette and Tammie, no matter how much as a society we try to ignore how race and class help us to organize our world, both constructs still exist and influence our ways of dealing with diversity. Even though Annette talked about colorblindness and creating a neutral classroom for her students, in the end race played a complex role in her use of an athletic career to motivate her students. While she might not have consciously made the connection between Black students and professional basketball players, avoiding race as a relevant construct in society kept her from being sensitive to the message that she was sending to her students about what they might strive to be. Similarly, Tammie, who was extremely caring and supportive of her students and who saw herself as an advocate for her minority students did not recognize the class stratification she perpetuated by suggesting to her students that a "country kid" was too deviant from middle class norms to function sufficiently in a mainstream classroom with his peers. In the end, those high expectations for all students required by NCTM under the *Equity Principle* (NCTM, 2000), though maybe a goal for these two teachers, were repressed by issues of race and SES.

As a society, we must both recognize that race and class are not illusions and recognize the role they have in our world. As teacher educators, we must work with teachers in ways to help them become aware of their vulnerability to such messages and how their biases might influence their teaching. Of equal importance is helping teachers to understand the messages that they send out to their students either about themselves or others. Without addressing how both race, class, and though not discussed in this paper but of equal importance, gender, influence all Americans, solving the problems of achievement disparities between racial and class groups is just an illusion, especially as beliefs associated with these identifiers interfere with

teachers' abilities to set and maintain high expectations for all students.

Some teacher educators have begun to discuss how we might incorporate a component into teacher education so that preservice teachers begin to deconstruct their own views about race, class, and gender and to think critically about educating minority students (Tate & Rousseau, 2003). Marx (2001) worked with White preservice teachers to uncover their racist beliefs toward students of color as part of a Second Language Acquisition teacher education course. She found that most of the teachers were unaware of the prejudices they held toward people of color, as well as unaware of their own white privilege. The teachers in the course engaged in tutoring sessions with students of color. These sessions provided a starting point for conversations between Marx and the preservice teachers about race, racism and white privilege. Marx reported that many of her participants progressed successfully toward understanding their own racism and how that racism intervened with their ability to be good teachers to students of color. More of this work with preservice teachers needs to be done. Also, work with inservice teachers needs to increase, as well. Providing these teachers, long out of a teacher education programs, with a standards document suggesting what equity in teaching should look like, is not enough. Teachers need to trouble their own ideas around race, gender, and class before being able to reflect critically on their teaching of diverse student populations.

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Appendix

Interview Questions

1. Describe the racial make up of a typical class you teach.
2. How do you define equity in the context of your classroom?
3. Describe the role of equity and diversity in the NBPTS.
4. Explain how through your practice you have addressed the Equity, Diversity and Fairness standard.
5. Describe any difficulty you have had in addressing this standard.
6. How did you provide evidence in your NBC portfolio of attending to the diversity of your classroom? Equity?
7. Why do you think this standard was included in the NBPTS?
8. How has NB contributed to your thinking about diversity and equity?
9. How has NB contributed to your attention to diversity and equity in your teaching practice?

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The Struggles of Incorporating Equity into Practice in a University Mathematics Methods Course

Denise Natasha Brewley-Kennedy

This paper examines the challenges that one White teacher educator faced when incorporating an extensive equity agenda in her mathematics methods course. Theories of whiteness and silence were used to uncover these challenges. Four themes were identified; a need to maintain a safe place in class, her own sense of preparedness to discuss equity issues, student resistance to equity conversation, and her comfort level in discussing certain equity topics over others. Two frameworks are provided to support teacher educators' work toward equity. The paper closes with a working definition of equity and implications for mathematics education teacher preparation programs.

One of the important tasks of a teacher educator in mathematics education is to prepare preservice teachers to teach mathematics. The primary goals of a mathematics methods course are imparting the mathematical content needed for specific grade levels and demonstrating to preservice teachers that all students, no matter what their background, can effectively learn mathematics. Educational equity—associated with race, socio-economic status (SES), gender, and special needs status of students—are issues that are expected to be addressed in teacher preparation (Grant & Secada, 1990; Martin, 1995). However, the failure to address any of these may reflect a lack of preparedness or comfort by some teacher educators, in the same way that some mathematics topics get pushed to the side by some teachers. Although some teacher educators have an awareness of equity and believe that it is important for their preservice teachers to embrace, not all are able to attend to it as extensively as they would like when teaching their courses. This dilemma becomes even more pronounced when teacher educators and preservice teachers are predominantly White.

In predominantly White teacher preparation programs, there may be ambivalence by some White teacher educators to interrogate equity or diversity related topics with their preservice teachers, particularly when they feel inadequately prepared to address issues of race and social class. The burdens of whiteness also stand in the way of creating meaningful discussions about sensitive topics when this racial identity is left unexamined (Hytten & Warren, 2003; Gillespie et al., 2002; Solomon, et al., 2005). Confronting these issues becomes even more of a challenge in mathematics education preparation programs where there is little room to explicitly address highly sensitive socio-political topics due to the demand to cover mathematical content. Despite these challenges, the critical task remains to prepare preservice teachers for the realities of schools and the increasing diversity of classrooms. Improving the preparedness of preservice teachers to teach mathematics and address equity and diversity begins with teacher educators' ability to attend to these issues first for themselves (Weissglass, 1998).

This study is part of a larger research project which examined the role of equity in mathematics teacher educators' practices. The research project attempted to reveal the challenges teacher educators faced when infusing various aspects of equity across three methods courses taught in one university mathematics education department. The examined courses included one each at the elementary, middle, and secondary school levels. The primary focus of this case study was to better understand the challenges that one White teacher educator faced when incorporating an extensive equity agenda in her mathematics methods course. The research questions that guided the study were the following:

1. What are the personal struggles and challenges that a teacher educator encounters when setting agendas for equity as she plans for her methods course?
2. What are the main equity concerns for a teacher educator in a mathematics methods course? (i.e., the range of equity issues that she feels comfortable talking about, such as issues of gender, race, socioeconomic status, or special needs.)

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3. To what extent is a teacher educator addressing equity issues explicitly versus implicitly in method courses with preservice teachers?

The findings of this research study may have important implications in mathematics education preparation programs as there is an increasing demand to work toward an agenda for educational equity throughout the field.

In the section that follows, I initiate my discussion with what I call the necessary attention to equity in teacher preparation. I give a brief historical overview of this attention to equity in mathematics education by showing how various standards documents and scholars in the field have called for and defined equity. I conclude this section arguing that the call for equity in teacher preparation is insufficient. Teacher educators must be better suited to work with preservice teachers to understand how inequities persist by first interrogating these issues for themselves. The methods section is then presented, with an introduction to the participant and the methods course that she taught, along with method of data collection and the approach to data analysis. I then present the results section, the struggle of infusing equity, which includes four themes: (a) her need to maintain a safe place in class, (b) her own sense of preparedness to discuss equity issues, (c) student resistance to equity conversation, and (d) her comfort level in discussing certain equity topics over others. The discussion section then follows which explores two frameworks: theories of whiteness and silence, and working towards educational change. I finally close the article with the conclusion section which provides a working definition of equity and implications for mathematics education teacher preparation programs.

Necessary Attention to Equity in Teacher Preparation

It has been 2-3 decades since notions of equity first appeared in the mathematics education literature. Although equity was not defined explicitly in their work at the time, Reyes and Stanic's (1988) landmark piece was the cornerstone for looking at broader issues that affected differential achievement among diverse student populations. Their paper called for research that addressed societal influences, school mathematics curriculum, teacher and student attitudes, achievement-related behavior, and classroom processes. Reyes and Stanic urged mathematics educators to investigate these causal factors contributing to achievement differences. Subsequently, the work in mathematics education that followed suggested an equity agenda that focused on student outcomes for all students "with equality of opportunity and equality of treatment as prerequisites" (Meyer, 1989, p. 19). In *The Curriculum and Evaluation Standards for School Mathematics* published by the National Council of Teacher of Mathematics (NCTM) (1989), authors of the document offered a vision for creating mathematically literate students and setting standards in school mathematics. The 1989 *Standards* also carried very strong language about equity and insisted that as a matter of economic necessity, every student should have the opportunity to learn mathematics because if this was not achieved, we would "face the danger of creating an intellectual elite and a polarized society" (p. x). However, this document did not challenge the widely held belief that marginalized populations of students could not do mathematics.

A decade later, the authors of the 1989 *Standards* published the updated *Principles and Standards for School Mathematics* (NCTM, 2000) that put forth a more refined vision for achieving equity in mathematics education. This vision challenged a pervasive societal belief that only some students are capable of learning mathematics. To achieve this goal, the *Principles and Standards* required "raising expectations for students' learning, developing effective methods of supporting the learning of mathematics by all students, and providing students and teachers with the resources they need" (p. 12). Although *Standards*' writers explicitly state that to achieve this goal, "teachers also need to understand and confront their own beliefs and biases" (p. 13), there is not a framework in the document that suggests how this can be accomplished.

The National Board for Professional Teaching Standards (NBPTS, 2001) also published their version of a standards document that addressed equity for all areas of education. Although this document is not widely used by all teachers, those working toward becoming "accomplished teachers," particularly in mathematics, must attend to equity by "creat[ing] learning environments in which high expectations exist for all students" (p. 11). Furthermore, they state:

> Accomplished mathematics teachers are dedicated to meeting the needs of an increasingly diverse student population. They confront issues of diversity proactively to promote academic and social equity. They actively and positively challenge sexist, racist, and other biased behaviors and stereotypical perspectives, including those directed toward various ethnic groups, regardless of the source. (p. 11)

The body of equity-related literature also emphasizes specific kinds of pedagogy and practice that teachers should exhibit in their classrooms. Educators have suggested that mathematics teachers use culturally relevant pedagogy (Gutstein et al., 1997; Ladson-Billings, 1995a; 1995b; Tate, 1995), in their instruction, utilizing students' cultural background when posing mathematically related tasks. As other forms of equitable instruction, some educators also advocate incorporating all students in mathematical discourse (White, 2003) and promoting social justice pedagogy in mathematics to help students become better informed about their day to day realities (Gutstein, 2003). As a result of these varied initiatives, what it means to work for and attend to equity has come to take on several meanings.

The multiplicity of meaning that equity has taken on can be seen in the writings of several mathematics education scholars. One definition that resonates with many mathematics educators and is used widely is given by Fennema and Meyer (1989), who describe equity as composed of three outlooks: equal opportunity to learn mathematics, equal educational treatment, and equal educational outcomes. As they explain it, students should have equal chances to learn mathematics, while their various backgrounds are valued, and this treatment should produce similar outcomes. Allexsaht-Snider & Hart (2001) offer a similar definition and explain the requirements for getting there. They write,

> Our definition of equity begins with the premise that all students, regardless of race, ethnicity, class, gender, or language proficiency, will learn and use mathematics. A second premise is that all of the people who are involved with and interested in the education of children must become aware of the social, economic, and political contexts of schooling that can either hinder or facilitate mathematics learning for underrepresented students. Equity in mathematics education requires: (a) equitable distribution of resources to schools, students, and teachers, identifying it throughout the research process (b) equitable quality of instruction, and (c) equitable outcomes for students. (p. 93)

An NCTM Research Committee (2005), while examining the concept of equity, extended its definition and asserted that it encompassed "both the conditions of learning and as well as the outcomes" (p. 93). They describe the conditions of learning mathematics as follows:

> Equitable distribution of material and human resources, intellectually challenging curricula, educational experience that build on students' cultures, languages, home experiences, and identities; and pedagogies that prepare student to engage in critical thought and democratic participation in society. (Lipman, as quoted by the NCTM Research Committee, p. 93)

It is reasonable to say that in mathematics education, equity has been reified as an important concept for all mathematics teachers toward which to work. Although there exist some research that offers ways that courses, curriculum, and pedagogy could be structured to serve the needs of all students in mathematics, the scope has been rather limited (Meyer, 1989). Much of the scholarship argues for a focus on equity in a mathematics education context, with a particular emphasis on why teachers need to be more equitable in their practice (Martin, 2003; Schoenfeld, 2002). But what is neglected in the literature is how teacher educators can begin to address sensitive equity issues themselves in practice. Michael Apple (1992) argues that while NCTM's *Curriculum and Evaluation Standards for School Mathematics* (1989) "explicitly point to how schools may now operate to produce inequalities," they fail to address "how one might prepare our future teachers to do this" (Apple, 1992, p. 418). In order for teachers to become critical thinkers about equity, they cannot simply just be exposed to these issues. "Rather," Apple claims, "such an awareness is built through concentrated efforts at a relational understanding of how gender, class, and race power actually work in our daily practices and in the institutional structures we now inhabit" (p. 418). Julian Weissglass (1998) also asserts the following:

> Bias, prejudice, and discrimination are transmitted from one generation to the next and incorporated into our educational institutions in varied and complex ways. Curriculum, pedagogy, assessment, relationships, teachers' expectations and practices…have been and continue to be affected. (p. 99)

Kelly (2002) contends that "teaching equity will not only empower beginning teachers, it will also begin to offer more strength to the overall shift in the acceptance and understanding of societal equity issues" (p. 39). She also writes that "educational equity will likely not improve without education equality and this understanding of equality and equity should begin in preservice teacher preparation" (p. 39). This proposal is especially important in view of the changing demographics of our public schools.

Student populations throughout the country are more and more diverse, with a large proportion attending public schools that are majority Black or Latino. Given that public schools are becoming more racially mixed, preservice teachers need to be better prepared to teach students from a variety of backgrounds. The teacher workforce remains predominately White, middle-class, and female—approximately ninety percent (U.S. Department of Education, 1997). In many instances there is a disconnection between preservice teachers' vision of the students they imagine teaching and the students they will actually teach. Consequently, there is a cultural gap that continues to grow between students and their teachers (Sleeter, 2001).

In order to ensure that preservice teachers are equipped with the skills needed to begin teaching mathematics, equity issues should be explicitly addressed in preparation courses, in particular methods courses. As Weissglass (1998) argues, "Educators are an important force in helping many people overcome the effects of societal bias and discrimination" (p. 104). He also argues, "Race, class, and gender bias are serious issues facing U.S. society and education that are usually not discussed. Talking about them is necessary, not to lay blame, but to figure out better ways of educating our children" (p. 104). More importantly, I argue that because the face of the teacher workforce is predominantly White, middle class, and female, a teacher educator's personal and ongoing contestation with equity and related issues will better prepare them to infuse equity into their practice.

Method

This study emerged from my work as a graduate teaching assistant in a mathematics methods course for preservice elementary teachers. As I assisted the course, I learned about teaching preservice teachers, but also became very interested in the planning and decision making of the instructor. My study of her work, reflective discussions, and formal interviews began this investigation.

A Gaze In—Dr. Simms and the Methods Course

For the past 10 years, the participant of this study, Dr. Simms, has been a faculty member of the mathematics education department at a southeastern university. Her work and area of interest is children's mathematical knowledge. She has taught methods courses in the early childhood program quite some time. Although equity is not one of her self-proclaimed areas of expertise, she holds several leadership positions in her community, attends equity workshops, and continuously engages with colleagues who are more trained in this area to gain new knowledge and insight. As a White female, these experiences have helped her become more sensitive to and wrestle with her own subjectivity[1] while thinking through issues of equity. She is highly respected in the mathematics education community by her colleagues, her faculty peers, and by the preservice teachers in her classes.

As you walk into the classroom before class begins, there is quite a bit of chatter among the preservice teachers. The classroom seats 35 people rather snugly. This methods course is the first of a two-semester fall-spring sequence. The class meets twice a week for 90 minutes each; the preservice teachers know each other fairly well since they are in the same cohort of the elementary education program. Before class begins, preservice teachers are usually in conversation about what happened in their previous class or just regular conversation about their day. According to autobiographies they wrote for the class, all 33 of the preservice teachers are middle-class females from suburban areas surrounding a large southeastern city. With the exception of two preservice teachers, all are White and about 19 or 20 years old. As for the exceptions, two preservice teachers are Latina, one of whom is older and married.

On the first day of class, Dr. Simms asked the preservice teachers to draw a picture of their conception of a mathematician—an exercise she uses to uncover people's perceptions of who is a creator of mathematics. After about 20 minutes of drawing and discussion in small groups, Dr. Simms asked some students to share their ideas with the class. Many students drew old White men with glasses, some drew themselves, and others drew one of their parents. Dr. Simms pointed out that only a handful of students drew women and that no one drew anyone who was non-White (i.e., Black, Latino, Asian, or other). This exercise was Dr. Simms's way of getting students to attend to their own perceptions of who they thought could or could not do mathematics. As the semester progressed, I noticed that in a few cases, Dr. Simms was willing to entertain some conversation on difficult topics in class. I thought that it would be appropriate to engage in additional discussion with Dr. Simms on how she thought about infusing equity in her methods courses. Furthermore, I also thought that it would be a fruitful area for investigation to determine the areas where tensions arose for her in this process. Thus arose the development of this research project.

Research Design

The interpretivist methodology that grounded my orientation to this study is phenomenology (Crotty, 1998). This theoretical perspective reflects my need to move aside and tell the story as best I can of the teacher educator that I studied. As Sadler asserts, "Phenomenology is an 'attempt to recover a fresh perception of existence, one unprejudiced by acculturation'" (Sadler, quoted in Crotty, 1998, p. 80). Also, this epistemological perspective makes sense as a viable approach to the present case study because it "invites us to 'set aside all previous habits of thought, see through and break down the mental barriers which these habits have set along the horizons of our thinking … to learn to see what stands before our eyes'" (Husserl, quoted in Crotty, 1998, p. 80). Quoted in deMarrais (2004), Moustakas explains the goal he has in mind when conducting phenomenological inquiry. He argues that it

> is to determine what an experience means for the persons who have had the experience and are able to provide a comprehensive description of it. From the individual descriptions general or universal meanings are derived, in other words the essences or structures of the experiences. (p. 57)

Because I sought to understand the participant's attention to equity, case study methodology was also appropriate for this research. The unit of analysis for this case study was Dr. Simms and her perceptions of infusing equity into her methods course. Stake (1995) reminds us that the case study goal is to explore what specific cases will reveal, not primarily to understand all cases. Case study methodology coupled with phenomenology also served as a viable way of knowing that allowed me to disclose my own biases, bracket them off, and proceed with this work by keeping my subjectivity in check, constantly troubling the sense that my participant made out of her experiences.

Data Collection

Two interviews with Dr. Simms were audiotaped, one during the fall semester that class was in session, and the other as follow-up during the spring semester. These two interviews served as the main data source of the research study. During each interview, Dr. Simms was asked open-ended semi structured interview questions so that she could elaborate freely. The duration of the first interview was 90 minutes. As a form of member checking (Glesne, 1999), once the first interview was transcribed a copy was given the Dr. Simms to review. This served as way for initiating a second interview, a follow-up that lasted approximately 45 minutes. Dr. Simms commented on her notion of equity, her understanding of white privilege, and tensions of teaching mathematically related and unrelated content to preservice teachers.

I also collected data from the fall semester methods course. This data consisted of four components: the course syllabus, the required course readings, the daily agenda, and my field notes. The course syllabus helped me to understand what the main objectives of Dr. Simms's methods course were for each semester. Furthermore, it provided data that were instrumental in formulating interview questions about the course and how equity played a role in her planning of the course. The readings assigned to the preservice teachers gave me some insight into what Dr. Simms thought was important for preservice teachers to know and think about as it relates to children's mathematical learning. Also, I wanted to know if the preservice teachers would be exposed to equity through the course readings. The daily course agenda that Dr. Simms provided gave me a way of knowing what the activities were on a day-by-day basis. I wanted to see whether equity would be part of the agendas or whether it would come up incidentally as the preservice teachers brought up issues. Furthermore, I wanted to see how Dr. Simms would handle equity talk. The agendas also provided insight and ideas for interview questions.

Preservice teachers in this cohort were required to have an off-campus experience with students at a local school for 8 weeks. As a result, I took field notes during the remaining 7 weeks for the 21 classes that met on campus, taking special care during those classes where equity issues were openly discussed.

Approach to Data Analysis

My primary focus was to understand the challenges faced by Dr. Simms as she thought about incorporating an equity agenda into her methods course, so my data analysis was multilayered. Glesne (1999) states that the notion of analysis "does not refer to a stage in the research process. Rather, it is a continuing process" (p. 84). With this in mind, I first went through each transcript and immersed myself back into the data set just to get a general understanding of what Dr. Simms stated in each interview. I also used this preliminary analysis to inform me on appropriate interview questions for the follow-up or second interview with Dr. Simms. I then used thematic analysis, an analytic inductive method (Bogdan & Biklen, 1992) to identify global categories. Eleven preliminary categories were identified in the

data set and were then coded. After several iterations of analysis each category was repeatedly grouped and regrouped until finally all collapsed into four central themes. The next section will demonstrate these themes and connect them to Dr. Simms' actions in the methods course.

Results—Struggles With Infusing Equity

Dr. Simms worked consciously and reflectively about infusing equity into the content of her elementary mathematics methods course. In our interview transcripts and classroom data, I identified four themes that spoke to the challenges Dr. Simms faced in incorporating an equity agenda into her methods course. They are: (a) her need to maintain a safe place in class, (b) her own sense of preparedness to discuss equity issues, (c) student resistance to equity conversation, and (d) her comfort level in discussing certain equity topics over others.

Maintaining a Safe Place

Throughout the interviews, Dr. Simms talked quite a bit about maintaining a safe place in her classroom. She was not certain whether a classroom setting was the appropriate place to deal with sensitive topics that had the potential to be emotionally charged. Although she addressed sensitive issues on occasion, she did not feel comfortable taking them very far. Dr. Simms said, "I feel like I have pretty good classroom management skills in general, but I am not sure if I am competent to manage emotions if students get heated with one another or somebody starts to cry. I am not particularly good at that kind of thing." Dr. Simms thought that a potential crisis might arise out of engaging in conversations about equity, and she did not feel confident in dealing with such a crisis.

Dr. Simms admitted that she did not directly challenge her students' beliefs as much as she would have liked. As far as equity was concerned, in her estimation the role of a methods course was to raise the preservice teachers' awareness of the differential levels of achievement of students from different subgroups, and then to overtly challenge their perceptions of why they thought this phenomenon existed. She also believed that a mathematics methods course was the place to help preservice teachers develop an "alternative set of beliefs," but that was not always easy. It was safe to challenge students' beliefs about mathematically related ideas such as what it means to do mathematics, but as for equity, she did not think that it was safe to explicitly address students' beliefs about race or poverty. Dr. Simms talked about the difficulty she had in challenging students' beliefs about race and poverty and their perceptions of other groups of people. She said,

> You know if they have negative views about Jewish people probably a lot of it…came from their families. And so I don't know how to deal with that kind of thing. It's much easier for me to confront their beliefs about mathematics. It is a publicly acknowledged thing that a lot of mathematics teaching that goes on out there is bad and some of them are willing to say, "Yeah, my seventh grade math teacher was horrible. She did this." But I think it is entirely another thing to realize that, "Gosh, I had this opinion of people who lived in the projects, and it's because every time we drove by them my mother would say lock your doors or whatever." I think it's sort of on a different level for them to confront [this] themselves.

Dr. Simms wanted her class to remain a safe place. By her estimation, the unpredictability of where emotions would go if a class discussion got too heavy was too much for her to handle:

> I don't know if I have ever said this before, or thought this before. I think I am genuinely afraid of what would happen if one student says to another something hurtful [or] accuses them. Somebody says, "That's just racist; I can't believe you said that." I think that I'm genuinely afraid of what that would degenerate into in a classroom of people [who] are supposed to be professional colleagues…. I don't have the skills to handle something like that. So yeah on some level it is about keeping it a safe environment both for them and for me.

Finally, one of Dr. Simms's major concerns is what kind of activities can be utilized to facilitate equity conversations. She says, "I guess that goes back to my wanting it to be a safe place in that I want it to come out of an activity. I don't want it to be me with thirty of them staring at each other trying to talk about something that's uncomfortable." She strongly believes that preservice teachers can have a more meaningful experience in the classroom when tough issues are brought out of a task or activity, intentionally chosen to initiate or elicit interaction and honest dialogue.

Own Sense of Preparedness

Dr. Simms distinguished between two types of knowledge that she believes she possesses and feels comfortable sharing with her students—mathematical content knowledge and pedagogical content knowledge (PCK). Using either of these content knowledges and

discussing equity issues are very different in her mind. Much of this distinction has to do with her confidence as to where conversations about mathematical content will lead, whereas that same confidence does not hold true for equity. She argues, "Part of it I think is my own comfort level with [equity]. I don't yet have, for lack of a better term, pedagogical content knowledge to…foresee where these conversations go, the way I do with other pedagogical issues." So in some sense, while Dr. Simms has PCK to cover mathematical content, she does not have this same kind of PCK to talk about equity.

During one class, Dr. Simms introduced the concept of *sorting* to preservice teachers and discussed how this concept could be taught to children. Some of the preservice teachers asked whether it would be appropriate to let children sort themselves by hair color or gender. Dr. Simms then asked the class whether race would also be an appropriate way of sorting children, and a lively discussion took place. Simms is not afraid of this type of discussion. Because her prior experience teaching the course, she knows that such questions will come up. In the following two excerpts, Dr. Simms's self-perceived mastery of mathematical content and lack of mastery when discussing equity issues in her methods course are juxtaposed. She starts off by saying,

> I['ve] taught these courses enough times [and] I've been with these students enough times that I could predict that the people-sorting thing is going to come up. I could predict which way that's going to go, and…ninety percent of the time I can gauge how that's going to go. Or calculators, I can gauge what their reaction is going to be to with and without a calculator [on a] test. I feel pretty comfortable about where that's going.

She then goes on to state,

> Equity stuff is still sort of a vast unknown in terms of how my students are going to react to it and what knowledge I have to bring to bear [on] the situation. So probably I hesitate from that standpoint. But I think I also hesitate from the standpoint that…these kinds of beliefs are so deeply personal and problematic for people when they start to realize, "Oh, maybe I do have some racist beliefs, or I have some beliefs about people who live in federally subsidized housing, or whatever."

Dr. Simms then talked about her confidence level when dealing with these issues. She says,

> I don't have the same level of confidence and knowledge with that as I do with mathematics. I've got a pretty [good] grasp of what kinds of readings and what kinds of activities will prompt [discussion], and what kinds of assignments will prompt [reflection], what sort of examination of their beliefs about mathematics teaching and learning and children. I don't have that same repertoire with regard to equity, so I am still trying things out with that.

In these excerpts we see that Dr. Simms wrestles with three things: appropriate content, her comfort, and her confidence. Although she knows the mathematical content that is appropriate for a mathematics methods course, she does not always have the right content knowledge she feels is necessary for bringing out equity.

Student Resistance to Equity

Because of the intentional cohesive and longitudinal nature of the early childhood program of study at this university, many of the preservice teachers in Dr. Simms's class are required to take a sequence of prescribed courses. Consequently, they have been exposed to multicultural education and to some issues related to equity and diversity, but not specifically in a mathematics education context. According to Dr. Simms, there may be some potential risk involved with this approach. Some students may get conflicting ideas about equity from different instructors. Moreover, there may also be some reluctance to engage in dialogue as a class depending on who the instructors are and how the instructors try to initiate conversations with students. Dr. Simms explains the danger in students' perceived over-exposure to issues of equity:

> Another struggle that I face is [that] I know, not from my prior experience but from talking to colleagues, that students at some level resist these discussions about equity. They don't see it as particularly germane to what it is that they are here to learn, and they…feel like they are being beat over the head with it and eventually they just submit and say, "Yeah, yeah, yeah. Equity is important. This is wonderful. Rah, rah, rah!" And they learn how to tell you what you want to hear.

Dr. Simms believes that she could lose the students' attention and interest if equity talk is not initiated correctly. She even argues that some instructors have been criticized by students who say that "equity is their thing" and that they are trying to make it their students' things. Some have complained that other instructors have problems with "the whole race thing" and they're trying to make it the students' problem as well.

As a White female professor preparing mostly White female preservice teachers, Dr. Simms

understands the power in her position and what it affords her. Unlike non-White instructors who might bring racial issues to the fore with these preservice teachers, who in turn might resist them, Dr. Simms knows that it would probably be easy for her to raise such issues without students readily dismissing her. In some ways, however, she also feels that she is not entitled to discuss equity issues with these preservice teachers: "I am a product of White privilege. How does somebody who is a product of White privilege stand up with just book knowledge about equity issues? I don't know yet how to make that a meaningful conversation and get beyond platitudes about colorblindness."

Preservice teachers differ in their consciousness about sensitive equity issues related to gender, class, and race. Dr. Simms struggles with how deliberately she should provoke and then address these forms of equity. She starts off by saying, "I don't realistically think that there is the time in two classes or that I have the expertise necessarily to help them resolve all of those issues. And I think…some of it is to some extent…it's like beliefs about mathematics." She goes on to say, "People are at different places with [equity issues], and they are going to leave at different places.… They are going to grow at different amounts because they are more or less open to it, they are more or less responsive, they are more or less thoughtful." Dr. Simms also thinks that equity should be addressed throughout an undergraduate teacher preparation program and not just in one or two mathematics education courses. Students should have a holistic notion of equity upon completion of their program. Approaching equity in this way she believes can mitigate student resistance.

Comfort Level With Some Equity Topics Over Others

I asked Dr. Simms if she was more comfortable discussing certain equity topics than others in her methods course. She replied that dealing with gender and the special needs status of students was far less threatening to her than dealing with issues of race or social class. When I asked her to elaborate, she explained that she did not think that gender and special needs status were emotionally loaded or politically sensitive. She also thought that preservice teachers were less likely to find those topics emotionally threatening.

When discussing race, Dr. Simms thought that she was in a self-correcting mode. She was not always sure what politically correct language to use when referring to certain groups of people:

> I think it's charged—the language people use and people not knowing where other people stand on issues. I mean even do you say Black or do you say African-American? Or do you say Hispanic or Latino? [You don't know] when you are going to step on somebody else's toes and…how to talk about these issues.… I'm just not comfortable forcing people to talk about that kind of stuff.

Dr. Simms described for me an incident that occurred between her and another colleague during a meeting. She had made a statement she felt was taken out of context. Afterwards, she was compelled to defend what she had said:

> My immediate reaction was to go back and edit what [I] had said and try to communicate to her what I meant…. I knew that…she and I were okay with each other and [that] later we would talk about it and it would be fine. But…I think there is a feeling of threat in the same way that I imagine people of color feel threatened when White people say something, and it doesn't quite come out right. Or [it] sounds like they are implying that all Black people are poor or all Black people come from single-parent families, or whatever…. It's like everything that you say is wrong in equity conversations, particularly if there are people who are different from you in the conversation, or particularly if…a person of color is the one who raises the question. The person of the majority race immediately is like, "Oh, I didn't mean that, or let me rephrase that." I have done it myself. There's this feeling [that] you need to revise your speech. And so it becomes a lot more about public appearances and less about figuring out what you really think, and why you think that, and what would be a different way to think about this.

Dr. Simms also worried that although she was still learning how to communicate her ideas about equity she might be doing some overgeneralizing about marginalized groups. As far as social class was concerned, she still felt it necessary to monitor her language. She believed that during the course she might have presented a skewed portrayal of Black and Latino children living in poverty. She thought that a stereotype had sometimes been communicated about these students to her preservice teachers, so she constantly attends to avoiding that. She maintained an ongoing meta-cognitive conversation with herself, much like a list of check points running through her head. She was always asking whether unintended messages had been sent to her preservice teachers and what could be done to correct that if they were.

Discussion

Dr. Simms demonstrated thoughtful consideration of the role of equity in her methods course, as well as a reflective engagement in her teaching practices. While she did intend to bring out issues related to equity in her mathematics methods course, she demonstrated apprehension about the level of engagement and the topics to be addressed. This discussion section is comprised of three parts; silence in whiteness and white women, safeness in silence, and working for equity. I lay out two frameworks. The first utilizes theories of whiteness and silence in order to explain how each of these two notions of equity may stand in the way of Dr. Simms' teaching goals. The second is Julian Weissglass' framework for teacher educators working for educational change as they begin attending to educational equity.

Silence in Whiteness and White Women

There is an emerging body of scholarship that explores whiteness in female educators, investigating how White women educators examine their understanding of their racial identity and how this plays out in their practice (Gillespie, et al., 2002; Solomon et al., 2005). Ruth Frankenberg (1993) writes that White women tend to think of race in one of three ways: essentialist racism, color and power evasion (i.e. the colorblind position), and race cognizance. The first can be considered to be the common conception of racism; the second view acknowledges color but rejects it as a determinant of how people are treated; and the final position acknowledges the difficulties of context—that is, the ways in which race can interact with SES to decide in advance the meanings and realities of one's identity and experiences (Gillespie, et al., 2002).

Some scholars contend that very few White women are race cognizant (Collins, 1995). Moreover, Gillespie et al. (2002) argue that due to gender socialization, "women tend to be socialized to avoid conflict, often remaining silent when they feel their opinions might cut them off from others, or more dramatically, invite physically violent responses" (p. 241). Consequently, for fear of stepping outside the circle of privilege, White women perceive that speaking out about sensitive issues like equity and diversity can be risky and choose to stay silent when it comes up in conversation.

In her investigation of silence in Whites, Mazzei (2004) also writes that Whites are rarely called to examine their racial position. There are hidden assumptions in Whiteness, even when it is not addressed. When this racial position is examined, "coupled with a cultural taboo learned early by many Whites that it is impolite to notice color or difference" (p. 30), meaning-full silences are produced. Further, for fear of being perceived as different, or impolite, or perhaps even racist, an intentional silence can be evoked in conversations to hide what is underneath the veil. The concept of *veil* is metaphoric in that it hides what we choose not to see, or wish not to see, for to see is sometimes unbearable. Quoted in Mazzei, Cixous states that "'Not-seeing-oneself is a thing of peace.' By looking through the veil of Whiteness, we can avoid what is invisible or unknowable" (p. 30). Mazzei also writes that "silences are not always veiled, nor are they always unintentional, but they can often be deliberate or purposeful—a choosing not to speak" (p. 30). In this sense, there is an intentional hesitation, pause, or non-speak, for fear of saying the wrong thing. As a result, a reproduction of Whiteness occurs through this resolute silence.

Safeness in Silence

Dr. Simms's desire to maintain a safe classroom connects well with Gillespie et al's (2002) thesis on gender socialization in women. Simms was willing to engage her class in certain conversations as long as they were not too emotionally risky for *her* to handle. As we have seen in her statements, Simms does not perceive gender and special needs status of students necessarily as touchy issues. However, she avoids the possibility of emotional conflict with preservice teachers by focusing on mathematical content and by venturing into discussions where she can predict where responses will go. There is a sense of control that Simms wants to maintain over classroom discussions. We see this when she says, "I am not sure if a whole class setting is the right place for people to deal with issues that are potentially emotionally charged" or her need to *correctly* initiate equity through meaningful activities. Unlike mathematical content which can be systematized and prescribed, aspects of equity discussions can end up in uncharted territory. Simms struggles with the appropriate content for bringing out aspects of equity and she would rather push some ideas to the side rather than taking the risk, losing control, and making her class unsafe.

It is important to mention that unlike some of the White teacher educators that Frankenberg (1993) theorizes about who operate with a colorblind perspective; Dr. Simms is indeed race cognizant. But this theoretical position suggests that there are two competing forces operating which hinder her from

finding other appropriate contexts in her class to examine race and social class in mathematics; her white status and the silence that can come from this status.

While the data from interviews suggested that Dr. Simms is a highly reflective White educator who was conscious of her racial position and how race and social class functioned in society and schools, she still struggled with her White position in relation to her mostly White preservice teacher cohort. Whiteness is all around us, but because it is normative and often goes unexamined (Frankenberg, 1993), Dr. Simms was not sure if many of her preservice teachers were open to this type of critical examination of self nor was she sure that because she looked like them she should provoke it. Although Simms understood that many of her students may hold the colorblind position, she was not willing to disrupt their whiteness for fear of stepping outside the circle of white privilege and losing the safety that her class offered (Gillespie et al, 2002). In some ways, Dr. Simms protects preservice teachers from their veil of whiteness because what they might see in themselves about their beliefs may be very uncomfortable, disturbing, or even traumatic. When Dr. Simms was asked to consider that as a White teacher educator, she could challenge preservice teachers in ways that a non-White educator could not, she argued the same point, a non-White educator could challenge them in ways that she could not.

The silence that comes from Dr. Simms is atypical of the one Mazzei (2004) theorizes. Unlike the silence Mazzei describes where sensitive topics like race or social class are avoided completely by some Whites, Dr. Simms has somewhat of an infrequent silence because she was willing to engage some of the time. Simms quite often finds herself in self-correct mode and seems to be more cognizant of this mode when she is around others whose race is different from hers. Her self-monitoring increases along with the need to use politically correct language because she does not want to risk offending another group of people by overgeneralizing. This fits in well with Mazzei's argument that some White educators do not want to "say the wrong thing." Consequently, in Dr. Simms' class she is careful of what she says to her preservice teachers because, as she stated, she may be communicating unintentional stereotypes. Dr. Simms does not want to do this and is not altogether sure how to correct it if it does occur.

Silence and whiteness theory helps us to consider the dilemmas Dr. Simms identifies with in her teaching. In the next section, working for equity, I use the second framework—working for educational change, introduced by Julian Weissglass to describe what teacher educators like Dr. Simms can do as they confront these challenges.

Working for Equity

The perceptions held by Dr. Simms related to infusing equity into her practice should be of no surprise. Many teacher educators, no matter what their racial background, whether they explicitly articulate it or stay silent, grapple with these same issues. The question remains: How should teacher educators talk deeply with preservice teachers about the inequities of schooling that often go unaddressed in mathematics education courses? The four themes described in this paper connect appropriately with Julian Weissglass' (1998) work, *Ripples of Hope*. Weissglass offers a framework for teacher educators to begin attending to equity and addressing their personal biases with the goal of affecting educational change. Specifically, to address equity in a nurturing educational environment, Weissglass suggests several considerations:

1. Only one form of discrimination is addressed at a time.
2. Everyone in the group is listened to attentively by someone (not necessarily by the whole group) about their own experiences, beliefs, thoughts, and feelings.
3. Participants have the opportunity to reflect deeply on their assumptions about equity by having dyads on and discussing the perspectives on equity.
4. It is recognized that the origin of present interpersonal difficulties between people is often in early distress experiences, cultural and racial biases, and societal discrimination.
5. People who have not experienced a particular form of discrimination listen respectfully (without analysis or debate) to the personal experiences of people who have been discriminated against.
6. Listeners get a chance (in dyads, support groups, and discussions) to talk about how they found out about prejudice toward or mistreatment of the group in question and their own feeling at the time.
7. All participants have the opportunity to talk about their common mistreatment as learners and as children (for example, how their experiences in and out of school affected their confidence, their curiosity, their ability to cooperate with other, their leadership).
8. People have the opportunity to talk or write about what they have learned and their next steps (or goals) in working for social justice in their personal lives, classrooms, or schools. (Small steps are sufficient!) (pp. 122–123)

Although maintaining a safe classroom environment is important and coveted by many educators, *safe* does not always mean the elimination

of risk. We must transcend the safety of our classrooms and take the appropriate risks. By risk, I am referring to the advancement of an idea whether it is accepted or rejected. The classroom is a place where uncomfortable ideas should be explored and there is a great risk to our schools and society when they are not. It is essential that students and teachers cultivate learning environments where their thoughts are expressed and respected, no matter how hurtful they might be—this is the only way that growth can occur.

An educators' sense of preparation is also important in our respective disciplines. Dr. Simms was a highly prepared teacher and prided herself in it. The comfort it provided may have also limited her in some respects. Many educators want to be prepared when they enter their classroom. But preparations can only go so far. We cannot always be completely equipped for difficult areas of our work, nor can we foresee unexpected discussions. It is important that mathematics educators communicate to students that they do not have all of the answers prior to engaging in these discussions. In a classroom each person has a unique experience to share, and there is no guarantee that educators will be able to address everything. But they should at least be willing to keep a dialogue open for everyone to explore.

The greater comfort level that Dr. Simms had with addressing gender and special needs over race and social class also comes as no surprise. First, attending to gender and special needs status of students are easier issues to discuss when preservice teacher cohorts are predominantly female. Second, the perceptions of race and social class in a U.S. context have historically produced disparities among students. The reality of this legacy often goes unexamined, and many teachers continue to shy away from these discussions. As Weissglass (1998) argues, there is risk in doing this work even when we are afraid. But he also argues, "Avoiding the issues through denial or intellectualization will be harmful in the long run" (p. 122).

Student resistance to equity is also an expected obstacle. Many preservice teachers do not understand how race, gender, or social class biases shape their outlook on the world and affect the students they will teach. As mathematics educators working for equity, we must be willing to engage our students in this type of personal learning and self-critique even when there is resistance. Regardless of our racial, ethnic, class or gender status, preservice teachers must become aware that these issues are important. They affect how different groups of student populations are perceived and how they experience schooling. Preservice teachers must also be encouraged to view inequities not just as one person's problem but as everyone's problem.

Conclusion

I have discussed the challenges that one White teacher educator faced when trying to incorporate equity in her practice. What implications for future work do these challenges have in teacher education? Some teacher educators might discuss equity and related issues in their courses, but as Dr. Simms argued, unless all equity issues are addressed in teacher preparation programs, there is no certainty that preservice teachers will be fully prepared for the realities of schooling. This research offers some insight into preparing teacher educators, namely by providing teachers with space to reflect on their biases, building alliances with other colleagues across disciplines, and expanding our outlook on equity.

Teacher educators must be allowed the space and given the tools to effectively reflect and examine their own biases. Weissglass (1998) conveys some of these same ideas by writing,

> Making classrooms more inclusive of children with different backgrounds and needs, without providing support to teachers to work through their biases and prejudices, will not guarantee a better education for anyone. We need to accompany needed policy changes with a program that provides people the opportunity to eliminate individual prejudices and the resources to make changes in their teaching. (p. 103)

For this work to be productive, it is essential that teacher educators also build alliances with colleagues from a variety of backgrounds to expand their outlook and understanding of race, class, and gender issues. Smaller support groups can also be effective so that educators can intimately share their concerns about equity that go unexamined or that they are uncomfortable addressing in larger settings.

Although, there are a number of definitions of equity, educators should first work toward a deep understanding for themselves before adapting any particular one. As mentioned earlier, the most widely held definitions of equity deal with equal opportunity, equal access, and equal outcomes. But as Weissglass (1998) suggests, ideas about equity also encompass political change, and social, psychological and institutional change. Weissglass argues that these five views of equity are important but insufficient. A definition of equity should not be fixed but should be

an evolving process. He offers a working definition of equity that stakeholders can utilize in order to begin a common dialogue toward educational change:

> Equity is the ongoing process (not a product) of increasing our own and society's capacity and commitment to completely respect individuals as complex thinking and feeling humans with different sociocultural, gender, and class backgrounds and values, and provide the necessary resources to assist people in learning. This includes overcoming the effects of any mistreatment on their ability to learn—whether it be at the hands of individuals or institutions. (pp. 120–121)

Addressing equity will continue to be a difficult area for many educators. As a teacher reflecting on her practice said, "To be conscious of equity and effectively deal with equity in the classroom, you have to open yourself up and look at yourself" (Weissglass, 1998, p. 122). That is when the real work for change begins.

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[1] The term s*ubjectivity* refers to the way in which individuals are constructed by cultural practices, language, and discourse. Each person is subjected to language, culture, gender, and race, among other things, which inscribe us and impact the types of experiences that we have. Our subjectivity influences our outlook on the world—an outlook unique to each individual. See St. Pierre, Elizabeth A. (2004) for further discussion.

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Persistent Iniquities: A Twenty-Year Perspective on "Race, Sex, Socioeconomic Status, and Mathematics"

Brian R. Lawler

Calls for *mathematics for all* and the discourse of equity have become normative in the field of mathematics education. The 1988 publication of Reyes and Stanic's *Race, Sex, Socioeconomic Status, and Mathematics* could serve as a marker for this new emphasis. This essay reconsiders their model to orient research; it is the response of the silenced interviewer in conversation with the model's authors. It is argued that the enforced passivity of mathematics educators has contributed to the twenty years of persistent iniquities in mathematics classrooms. While the model can still be of use within mathematics education, its users must consider its underexplored assumptions by answering *why teach mathematics*, questioning the *demarcation of difference*, and *allowing for agency*. Bringing equitable notions of these assumptions makes possible an approach to public education in which a mathematics education would emerge.

While it seems as though we in mathematics education ride tumultuous waves of reform and rescindication[1], we have in fact changed little during the past two decades (Wiliam, 2002), if not the last century (G. M. A. Stanic, personal communication, May 11, 2005), in the assumed certainty that mathematics should be an important part of the school curriculum *and* in the persistent iniquities that emerge from our mathematics teaching (e.g., see NAEP results over the past 30 years at http://nces.ed.gov/nationsreportcard/mathematics/). Toward educating all students for achievement in mathematics, no matter to whom this *all* referred, we have not veered from a path of iniquitable differences in achievement. Although recent evidence suggests that a gap in male and female achievement differences is extremely small (Wiliam, 2003), the quality of this learning certainly continues to show distinctions (Boaler, 2002). And while gaps narrowed during the 1970's and 80's, difference in mathematics achievement persists across demarcations of race and especially class, and may be increasing once again (J. Lee, 2002).

In 1988 a top publication in the field, the Journal for Research in Mathematics Education (JRME), printed Laurie Hart Reyes and George M. A. Stanic's *Race, Sex, Socioeconomic Status, and Mathematics*, a review of research about this differential achievement. In this seminal paper, the authors suggested a model through which future research could better understand the relationships among the factors that explain these differences in achievement. The equity work of the 1980's, and especially the gender work of the 1970's, seemed to have fueled a new emphasis on equity in mathematics education. In addition to the 1988 paper by Reyes and Stanic, the 1989 National Council of Teachers of Mathematics' (NCTM) *Curriculum and Evaluation Standards for School Mathematics* contained strong language for educating all students. These events mark significant moments as the field of mathematics education began an era in which a philosophy of *mathematics for all* governed the justification for curricular, teaching, and research practices.

This language of equity and social justice had thus been co-opted by the field of mathematics education, and resulted in small and worthwhile victories. However, Danny Martin (2003) makes a strong case to be wary of patting ourselves on the backs for a false consciousness, this enlightened social awareness, in which academia professes solidarity with the oppressed while remaining complicit in perpetuating the inequities made prominent to the field in the mid-80's. The markers, alluded to above, of an era of new focus on equity are followed by the year 1990, when the Class of 2003 entered kindergarten.[2] It is evident in today's research, and even in the media, that decades of mathematics education reform and strong statements about equity did not serve these students well (Reed & Kochan, 2003).

To paraphrase William Tate (personal communication, September 24, 2004), we don't need to spend any more time gap-gazing. As a field, we know that differences in mathematics achievement exist, and persist. As Tate petitioned, let's not concentrate on the fact that it is raining, but instead work to build the ark. It is Paulo Freire's (2002/1970) *praxis* that reminds me that knowledge without reflection and action is meaningless.[3] But given the decades of stagnation, I question whether we as a field

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can in fact transform ourselves to achieve the stated goals of policies echoing the *mathematics for all* rhetoric. Mathematics education, like any institution, structure, or system, works to propagate itself. This is in fact the history of the field (Kilpatrick, 1997; Kliebard, 1995; Stanic, 1984; 1986; Stanic & Kilpatrick, 1992). Ours is a field that emerged at a time, in the early part of the twentieth century, during which removing mathematics from the curriculum was given serious consideration.[4] Mathematics Education, as a scientific field, has existed and thrived dependant on it's own ability to justify itself. And it must accomplish this justification in a racist, sexist, classist society. Can it promote equity yet sustain itself in a hegemonic society?

In this paper, I will demonstrate that the enforced passivity of the mathematics education institution perpetuates the status quo of iniquitable social relations, namely differential achievement—based on the measures of the privileged culture—in mathematics. To do so I will first briefly discuss the notion of *enforced passivity*. This notion serves an underlying organizing principle of power relations as seen in agency, resistance, and dominance. These notions allow me to then return to a closer examination of the ways mathematics education has served to propagate itself. As the field burgeons into a revered beast of educational empowerment, it has become a *simulacra* (Baudrillard, 1988), a copy of a copy that has been so dissipated in its relation to the original that it can no longer be said to be a copy. The simulacrum stands on its own, as a copy without an original. Mathematics education is taken as is, ahistorical, uncritiqued, culture- and value-free (Ernest, 2000). This condition must be taken seriously in order for us to decenter and consider what we fail to think. In the subsequent section I will refocus attention onto what may be assumed to be organizing principles for mathematics education, namely the justification question: *Why teach mathematics?* (Stanic, 1984). And to conclude, I return to the model proposed by Reyes and Stanic to reinstate its value as a tool through which mathematics educators can renew work toward equity in school practices.

Enforced Passivity

Mathematics education has attained a revered status in the capitalist culture. Knowing mathematics is attributed to potential for success, and is tightly linked to intelligence within our society. Public advertising campaigns issue dire warnings threatening the dismal future in store for children if they do not learn mathematics. For example, the National Action Council for Minorities in Engineering, in conjunction with the Ad Council and with support from NCTM, says the purpose of its "Math is Power" campaign is to

> provide information to parents and students about the importance of advanced mathematics courses in high school. The knowledge base of algebra, geometry, trigonometry, precalculus or the equivalent in integrated curricula are crucial gatekeepers for access to a broad range of careers, including engineering, the natural sciences, accounting, investment banking and many others. Students who opt out of academic mathematics as early as eighth grade, essentially forego any future opportunity to pursue a career in such fields. (http://www.figurethis.org/wc/w_grantee_nacme.htm)

Unstated, yet communicated in such rhetoric is that 'no math means no power,' and whether a child 'opts out' or fails out of mathematics dooms him or her to a position in society in which *they* have chosen their relegation to oppression.[5]

In addition to strong messages in the discourse of education, success in school, and more significantly—potential for future success in school, is measured in large part by standardized tests weighed heavily by scores in mathematics. These strong implications for potential for success in our society and our economy have not only severely politicized mathematics education (Mellin-Olsen, 1987; Wilson, 2003) but also powered the status of the field, and those working within it.

With the greater power attained by the privileged position in the society, we also become greater servants to the demands of the society. Whether the demands come couched in the technocratic language of human capital theory or as a critique for the failure of schools to address the major problems of a race-, class-, and gender-divided society, these demands put education in a position of defense, engaging its efforts to respond to and correct its weaknesses (McLaren, 1994). The demands engage us in externally-driven activity, and the power blinds us to the wicked contortions of our actions in light of our democratic goals (Kincheloe & McLaren, 2000; Spring, 1993).

The combination of these two elements of our postmodern existence in mathematics education—powered position and reactionary turmoil—has resulted in a certain passivity in the role mathematics educators play in shaping the goals, practices, and outcomes of our field. To clarify this passivity, I draw on the postmodernist efforts of psychology that seek to blur the strong distinctions between the cognizing

subject and the social realm.[6] Steig Mellin-Olsen (1987) extends Vygotsky's activity theory to "embod[y] the individual and the society as a unity: the individual acts on her society at the same time she becomes socialized to it" (p. 33). Weissglass (1991) draws on Mellin-Olsen to create a usable definition for Activity: "a learning experience that engages our capacity to take care of life situations" (p. 281). Passivity, as a sort of antonym for Activity, would then be a disengagement from our capacity for living. *Enforced Passivity* is the denial of access to Activity.[7]

The power relations at play (Foucault, 1997/1984) for mathematics educators certainly makes this denial of access to Activity markedly different from the overt hegemonic actions of a common classroom learning environment (Kohl, 1994; Kohn, 1999; Oakes, 1985). Further, the adoration and undiscerning reverence afforded our elite societal position allows us to ignore our own complicity in the iniquitable outcomes of mathematics education. We are given latitude to justify unequal results through non-human and non-affectable processes, such as the deficiencies of the learner or her family[8], poor curriculum, a lack of time, or under-prepared teachers.[9] Each of these deflects responsibility from the field of mathematics education. In effect we are allowed to say, "Don't blame us for the miseducation of our children—we weren't provided what we needed to educate them." The quiet acceptance of these standards for our work, both by ourselves and by the larger society, are examples of the enforced passivity of our field.

Because mathematics education must also be engaged in the politics of pressing for change, the brakes of institutional stability and reproduction operate to constrain our facility to act by binding us to resource-intensive processes of communication and documentation (see for example Crandall et al., 1982).[10] This also draws our own Activity away from direct effort on our goals. In effect, our work is diverted sideways, and while we are still working on change in the practices of mathematics teaching and learning, our focus and efforts are redirected. Our ends become obscured; we settle for partial and/or ineffective implementation of ideas, or do not engage in the continued learning and change necessary to implement new ideas into practice. Again, this diversion of attention is another form of enforced passivity invited by the powered status of mathematics education.

*The Research Design—A Sideways Step

The discussion I seek to promote with this paper arises from a small-scale research agenda instigated by a group of graduate students at The University of Georgia. Each of us was intrigued by ideas about equity and frustrated by the apparent passivity of mathematics education. Equity issues had been heightened for us through the variety of research projects in which we interacted with preservice and inservice teachers and teacher educators. For several of us, the structures of racism, sexism, and classism that are particular to the South were different enough from those of the cultures we had moved from, that educational iniquities became more evident. We organized a study group around this concern and developed two guiding principles, to answer what equity meant to each of us, and to carry out a research project related to equity in mathematics education.

Through this group's collaboration to read and discuss prominent and historical papers on equity issues within mathematics education, we read Reyes and Stanic's seminal work *Race, Sex, Socioeconomic Status, and Mathematics* (1988). As a result of their meticulous review of literature on disparate achievement in mathematics education, Reyes and Stanic proposed a model to explain differential performance based on group characteristics of race, sex, and socioeconomic status (Figure 1).[11] This model considers factors within schools and classrooms, factors external to schools, and the characteristics of the individuals involved in children's mathematical achievement. In particular, the model draws attention to Societal Influences on Teacher Attitudes, Student Attitudes, and School Mathematics Curriculum. These attitudes interact with Classroom Processes to influence Student Achievement, which itself feeds back into the cycle of interactions. Each arrow suggests a causal connection for differential achievement, not yet established by research at the time of publication but presented as a guide for future research.

Because Hart[12] and Stanic are professors at The University of Georgia, the research project I developed was an interview with these two as the authors of a substantial contribution to the field. As I approached them about the possibility, they were enthused to pursue such a discussion, but insisted that the interview not become a hagiography. Instead the goal of the research was to be a critical analysis of the 1988 paper. The resulting 2-hour interview informed the arguments I've developed within this paper. The paper is also informed by the previous year of literature review and discussion on themes of equity in mathematics education with my research group, work

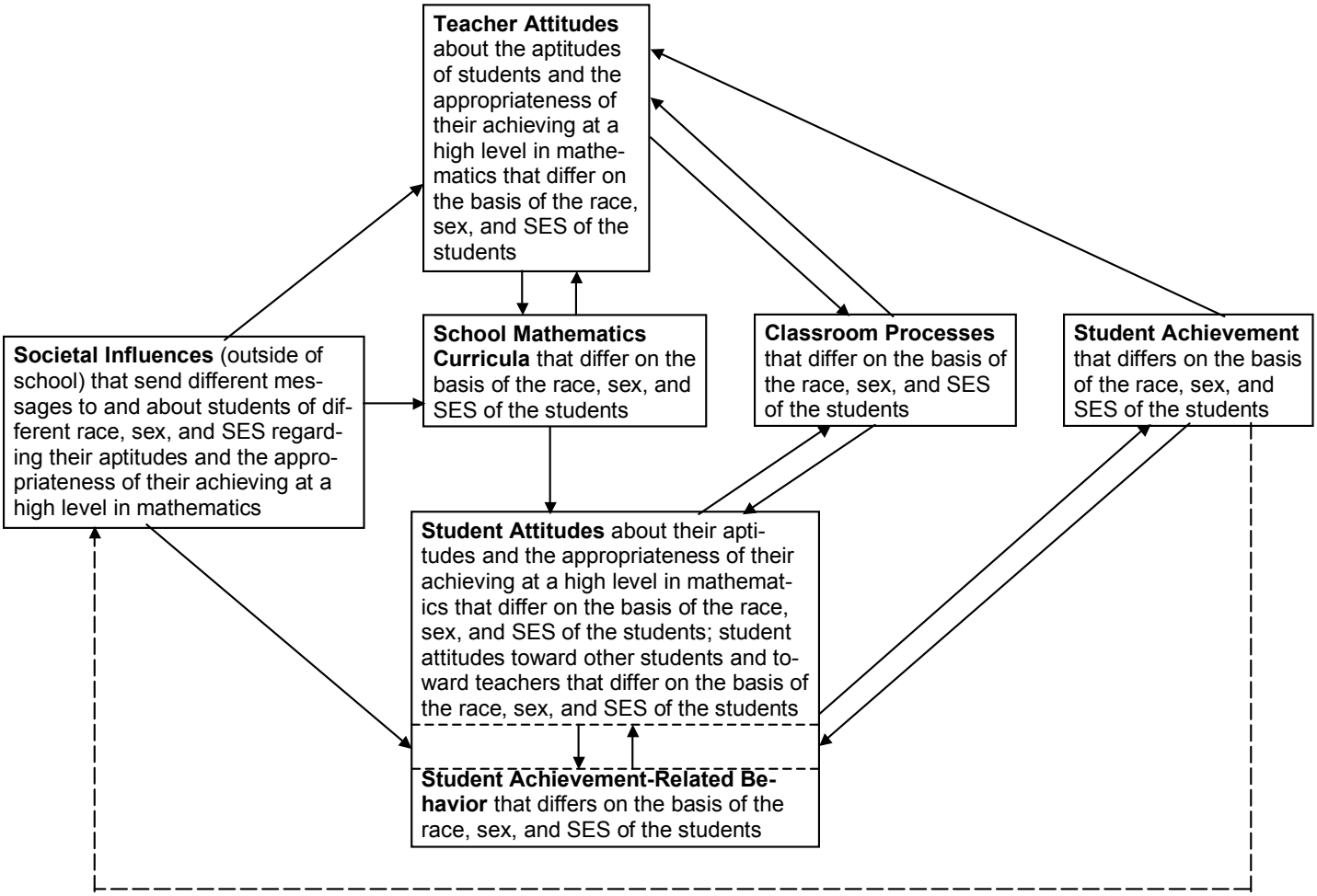

Figure 1. Replication of Reyes and Stanic's (1988) Model to Explain Differences in Mathematics Achievement Based on the Race, Sex, and Socioeconomic Status (SES) of Students

that paralleled Hart and Stanic's efforts preceding their paper. I write the paper as an attempt to capture my silenced role in the dialogue of the Hart and Stanic interview. Hart and Stanic's voices will only occasionally be heard; it is not my goal to present them as the subject of this essay. When referring to them as members of a discussion, I will use their forenames, Laurie and George respectively.

My paper reflects in part the theory I brought to the interview. However, that theory has changed as a result of the interview, and evolves even as I write. The study group, interview, analysis, and writing experiences have led me to present this paper as two intermeshed encounters for the reader. The primary thesis of the paper, that the structure of mathematics education must find entirely new ways to work, will be developed and argued throughout. However, I will sidestep to discuss the research design and memories of the interview in order to recognize the manner in which my thinking changed during and as a result of the silenced discussion.

To accomplish a presentation with two kinds of focus, one external—a critique of the field, and the other more local—about my research project and study group, I present each focus entangled within the other. In particular, as I move to present the research design and interview memories, I use right-justified headings. Although my presentation may appear to be a planned confusion, it is not so much that but an intentional effort to keep the complex issues of equity in motion rather than feign the promise of a coherent, unified theory for equitable educational outcomes. I intend to make the politics of interaction, data creation, and analysis explicit yet un-rationalized. I also make no effort to maintain a linearity of time, instead drifting among the rhizome of nomadic thought (Deleuze & Guattari, 1987/1980). In my effort to challenge an easy read (Lather & Smithies, 1997; St. Pierre, 2000a), I engage the reader as a thinker, willing

to trouble the taken-for-granted and to create new imaginaries. With such a presentation I invoke the reader to challenge the words, relinquish the grasp on knowing, and allow intuition to play.

Reproduction, Perpetuation, Replication

Is what I attribute to be repetition a fact of being or a matter of my experiencing?

Habit and tradition allow us to muddle along through the postmodern paradoxes of analytic rationality. But again, is habit a guiding essence of our living, or a name for ways we experience our living? Any way conceived, habit seems to act as a strong force toward the replication, reproduction, and perpetuation of an unjust society through our efforts to educate. Dewey (1937) makes an interesting case that education necessarily *does* reconstruct future society and thus should do so intelligently. He rejects the notion that schools can only replicate the existing social order. In so stating, he makes the actors in the school the responsible parties for the shape of things to come, not subjugating us to habit and repetition. Yet there are people who maintain theoretical positions that render impotent the schools, so that they can only work to reflect and support the dominant political and economic regime.

Mathematics Reproduced

Schooling is a system organized to name success and failure (Boaler, 2002). Naming the standards of success in mathematics education also names the substandards, thus locating the failures. Even the phrase *all children* "functions as a pivoting point to distinguish two human kinds… the child who has all the capacities to learn, problem solve, and achieve in schooling, and the child who is of a different human kind, the *disadvantaged*" (Popkewicz, 2004, p. 23). The *successful* mathematics student—or teacher—demonstrates particular kinds of activity. Standards are set to locate and regulate her mathematical learning or teaching, inner qualities of this person. It is a "psychological ordering of the mind" (p. 10), designed to govern the child. Although serving the language of equity, the "direction of the improvement is through the remodeling of the child's soul, or inner being and dispositions" (p. 11). The seemingly enlightened and liberating activity of mathematics education in fact serves to continue to forge the child into a *particular* being, designed to either fit or not fit the power relations of society.

Mathematics education does not work to realize the living of the child, but to enact in the child particular, culturally-defined, ways of operating and interacting that are deemed to be mathematical. We treat the content of mathematics as stable structures of conventional ideas, "inert, unchanging, and unambiguous 'things' that children learn" (Popkewitz, 2004, p. 18). And although these things appear to make the learner more of an active participant by expanding the child's role in solving problems and applying their own thinking, we simultaneously make them less active in defining the possibilities and boundaries for their engagement. Where uncertainty is to lead to exploration, the teacher maintains a certainty of the outcome—this double quality emerging because we are compelled to treat the content of mathematics as stable structures, and thus for students we make problematic those situations to which solutions are already known. Mathematics education is mired in this postmodern quandary by not having new ways of thinking or a language through which to communicate (St. Pierre, 2000b). We have yet to develop language to allow conception of the teaching of mathematics to be that of the child (Dewey, 1964/1902), through which she asserts her present powers, exercises her present capacities, and realizes her present attitudes; and in which the body of knowledge conceived to be mathematics is drawn upon by the teacher to intelligently determine the environment of the child. Dewey's *Child and the Curriculum* (1964/1902) proposes a conception of mathematics education that does not know *a priori* the solutions to questions of child, and is not relegated to governing structures that reproduce the mathematical learner of the powered society.

Folk Theories Perpetuated

The emergence of research on instances of success particular groups of students have demonstrated in learning mathematics, whether it be accomplishments in urban settings (e.g. Boaler & Staples, in press; Gutstein, 2003), with female students (e.g. Boaler, 2002; Walshaw 2001), or African-American students (e.g. Martin, 2000; Moses & Cobb, 2001; Stinson, 2004), is another marked quality of mathematics education in the past decade. As a result of such work, we are drawn to identify *what works* for these particular groups of children. For example, NCTM released the series *Changing the Faces of Mathematics: Perspectives on…* (*Gender, African-Americans*, …) to communicate good teaching approaches that have been demonstrated to work with

these subsets of our student populations. Yet NCTM backhandedly also perpetuates the marginalization and essentialization of members of these groups by suggesting certain students possess particular preferences by virtue of their race, gender, or culture (Boaler, 2002).

In our interview, Hart and Stanic agreed that this trend in mathematics education research concerns them. While they respectfully admit not knowing all research from these perspectives and having great respect for people who do this sort of work, they expressed hesitantly:

> In the context of mathematics, I have yet to find someone who has been able to help me understand the way we should be doing things differently in mathematics for children of different backgrounds. [Such a perspective] creates differences that aren't there in the first place; it takes differences that are there and makes them problematic. And it borders itself on racism. (George)

The position evidenced in NCTM's publications accentuates difference,[13] and seemingly common-sensically suggests we must treat people of different races or genders differently. But what seems to emerge are prescriptions for teaching different groups of kids in ways that sound like just plain good educational practices for every child, regardless of race, class, or gender. Not only might this vein of research reproduce and strengthen iniquities through its process of naming, but it also busies the field in research and dissemination work that replicates what we already know to be good teaching. We are not learning new ways to teach mathematics, let alone to teach mathematics equitably. We are merely renaming good teaching practices with equity-friendly titles in order to allay our desire to feel productive in our work; enforced passivity.

Beyond Replication?

I bring forth the ideas of reproduction, perpetuation, and replication (habit) in order to raise the question: Can the field of mathematics education move beyond current ways of working that only seem to replicate differential achievement outcomes? "Mainstream research practices are generally, although most often unwittingly, implicated in the reproduction of systems of class, race, and gender oppression" (Kincheloe & McLaren, 2000, p. 291). Dylan Wiliam (2002) notes that research has failed to have any "real impact" (p. 476) on mathematics education (also see Kilpatrick, 1992) or is irrelevant to the practice of teaching. Wiliam argues, both philosophically and empirically, that research needs to focus on practical wisdom rather than the kind of analytic rationality espoused in the physical sciences. Mathematics education cannot be guided by universal rules, but instead by the practical wisdom that emerges from intuitive thinking and an active process of knowledge creation:

> Teachers will not take up attractive sounding ideas, albeit based on extensive research, if these are presented as general principles which leave entirely to them the task of translating them into everyday practice—their classroom lives are too busy and too fragile for this to be possible for all but an outstanding few. What they need is a variety of living examples of implementation, by teachers with whom they can identify and from whom they can both derive conviction and confidence that they can do better, and see concrete examples of what doing better means in practice. (Wiliam, 2002, p. 15, quoting Black & Wiliam, 1998)[14]

I would argue that the above line of reasoning, that we need to see it, *and* be able to imagine ourselves doing it, applies to all levels of practitioners in the field of mathematics education: teachers, teacher educators, researchers, and even students.

Deconstructing Traditions

In this section I will dig further into Reyes and Stanic's (1988) model. My intention is not so much criticism, but to unearth assumptions, explore dangers, and make problematic issues that may otherwise be overlooked or ignored. This critique is done with the postmodern notion of deconstruction in mind—the assumption that all writing is full of contradiction and confusion. Like Derrida—the so-called father of deconstruction—I won't seek to define what deconstruction is,[15] but instead point toward its practices, as does Gayatri Spivak (1974) in the preface for Derrida's *Of Grammatology*. While poststructural work tries to open up meaning, the metaphor—or in this case the model—is troubled, for a metaphor works to make difference the same, to close down possibilities. "When a metaphor seems to suppress its implications, we catch at that metaphor" (p. lxxv). Deconstruction also considers the lack of sovereignty of the critic himself—it is a self-distrust, a distrust of one's own power, a realization that one's choice of evidence is contingent.

With this spirit of critique in mind, I trouble three qualities of the model. First, I discuss the assumed goals of mathematics education. Uncritically used language hides definitions the field has radically varying ideas about. I do not claim that we should

strive for singular notions; I argue that we tend to ignore that meaning and understanding and assumptions are not shared, especially in the context of equity work. Next, I problematize the simplification of demarking difference along group lines in the context of equity work. And third, I look for the agency of the child or the teacher within the model. As I incorporate Hart and Stanic's interview discussion into this critique, it will be evident that each notion above was a part of the creation of their 1988 model. However, as metaphors always work, not all possibility, and in this case significant issues, are evident in the JRME presentation.

The Justification Question

"Why teach mathematics?" is more than just a request to consider the demands of various constituencies upon mathematics education, or to consider our own enlightened self-interests (Secada, 1989);[16] it literally stands historically as a defense for the existence of the field (Kilpatrick, 1997; Kliebard, 1995; Stanic, 1984, 1986, Stanic & Kilpatrick, 1992). Yet its responses are assumed. Even a justification for the existence of teaching mathematics is assumed to be so self-evident, we as a field forget to ask (Davis, 1995). And of course, the variety of beliefs of mathematics educators, when left unstated, lead to discourse that speaks past one another, full of unshared assumptions. More importantly, in the present context of equity, each of the responses to *Why teach mathematics?* has felt justified in co-opting the language of equity, no matter if the reasons are as diametrically opposed as learn math to *contribute to the economy* (National Commission on Mathematics and Science Teaching for the 21st Century (U.S.), 2000; NCTM, 2000) and *create a docile and efficient workforce* (Greer & Mukhopadhyay, 2003), versus learn math to *question and challenge the current structures* and to *reconstruct society* (Dewey, 1937; Skovsmose, 1994).

In the interview, George noted three types of answers to the justification question, direct utility themes, that mathematics trains the mind, and the idea of mathematics being a cultural tradition. Laurie adds that mathematics should be taught for access to power and resources as well as awareness of mathematics as a tool of oppression. Laurie and George express concerns about the emphasis on direct utility in equity dialogue, because discussions seem to frequently ignore that most people are in fact able to function in their daily lives without a profound level of mathematics.[17] George further troubles each of the remaining arguments, that there is little evidence in support of the notion that mathematics trains the mind, and that the cultural tradition perspective is complicated by an overemphasis on western culture. George concludes with his own response to the justification question, that mathematics seems to be "this interesting phenomena that has arisen among human beings, and thus worthy of study because it's such an important part of human life, historically."

Deconstructing the question itself: Mathematics. The question itself is not innocent. Each word in *Why teach mathematics?* carries multiple and assumed meanings. With an intense conviction, I can say I do not know what mathematics *is*. An answer to such a question is certainly an underexplored point of disagreement in the field of mathematics education. While many of the constructivisms, whether explicit learning theories or about the social interactions of a classroom, take as an underlying assumption that mathematics is a human (or social) construction, most fail to act upon such a radical (von Glasersfeld, 1990) ontological stance. If mathematics were not an *a priori* body of knowledge, than what is the thing that we treat as mathematics? Is it some thing that exists external to humans? If not, than which mathematics is to be learned? Or maybe better stated, whose mathematics? Mathematics now is a question of power.

Laurie notes that we have struggled with this question of what mathematics to teach, and thus have muddled along not doing much differently than what has traditionally been done. In her experiences learning mathematics, she found more interesting what lies beyond computation, justifying for her the move beyond recipes and algorithms to thinking. George toys with a common definition of mathematics as the study of patterns, which he notes doesn't necessarily "distinguish mathematics from anything else. All of life is the study of patterns." He goes on, "Habit is because we begin to do things in patterned ways…. So in that way, doing mathematics is being human." Next George considers the functioning of mathematics, to name, categorize, mark borders, and to work within those borders. He returns to the existence of mathematics by recalling his current reading of Proust's *In Search of Lost Time*:

> There's a point at which he basically says, 'Ideas are the only real thing'…. So, the interesting thing is that there is this chance that the ideas of mathematics turn out to be more important than what any individual does or thinks…. And so in the end I have no trouble with this *thing* that we call

mathematics, that isn't so much outside of ourselves than it is part of what we are."

Deconstructing the question itself: Teach. "Teach" also carries with it a variety of meaning, within the profession, external to the profession, and in my own ways of thinking of my activity in all human relations. For the American society, "teach" carries a connotation more aligned with "instruct", or "give". It is filled with a purpose of passing along knowledge, this sort of *thing* possessing an existence external to the mind (or George's *being*) of people. It is that which we as teachers have become experts in, and now it is our role to grease up and slide painlessly into the minds of novices. I find many fellow teachers to cringe at the label itself, preferring to be called an educator,[18] or facilitator. I am uncomfortable by each, in that each term seems to merely change the quantity or quality of the grease being used. I don't shy away from being named *teacher*. For me, I find fascinating the relations among people in which seemingly both parties grow/change/learn, increase their freedom.

Deconstructing the question itself: Why. Finally, the question itself—Why? The question is not innocent; it demands an answer. But not merely an answer, especially when asked in the context of the analytic rationality of academia. It insists on justification, a justification that has some standard that must be attained. It assumes an answer exists. It assumes itself to be a worthy question. Ultimately, the more interesting question is: Why is this necessarily a question that should even be asked? The asking of the question itself, provided with a validity from within the discipline—whether that be mathematics or mathematics education—serves in the justification of the discipline itself. It is a way of securing power in an enlightenment-era society, in which reason and rationality rule.

Paul Ernest (2000) troubles many of these same assumptions our field leaves underexplored. Along with the recognition that "school mathematics is neither uniquely defined nor value-free and culture-free" (p. 1), Ernest returns us to the seemingly unattainable challenge: "The justification problem in mathematics education is problematic" (p. 8).

What is Equity?

If the question *Why teach mathematics?* is problematic, dare expect the field to have a unified vision of equity. The notion of equity has a quality of idealism, as do notions such as democracy and freedom. It is the sort of notion Apple and Beane (1995) refer to as a sliding signifier, having no essential meaning but defined in its use within relations of power. It is a nice target. But with such an aversion to definition, is it a useful idea, or one that has become meaningless? Who admits opposition to equity?

For the sake of discussion, Weissglass (1998) identifies five views on equity: (1) Equity as equality; (2) Equity as access; (3) Equity as proportional outcomes; (4) Equity as political change; and (5) Equity as social, psychological, and institutional change. The first three merely describe, while the final two bring along a demand for action, a praxis orientation. Within these five views emerge conflict. 'Equality' and 'proportional outcomes' may not be the same. 'Access' to mathematics as is, or to a changed mathematics? While the second view considers access to mathematics, the fourth view is more explicitly about access to power. Finally, the potential socio-cultural change of the fifth view returns to wonder *Why teach mathematics?*

Laurie considers ways to think about equity with perspectives similar to the first three of Weissglass, "Some people talk about equity as equal experience. For me that isn't equity…. Another one is equity as providing equal opportunity. Another one is providing opportunities so that people reach equal outcomes. And the one I'm most interested in is equity as equal opportunity, of those three." George prefers to think of equity "as the opposite of iniquity, as the opposite of something evil. So that it's more than the kind of gentle word than we think of it as…. When you start thinking of it as that which is the opposite of iniquity, suddenly you seem to have more responsibility." Both seem to maintain a justice-oriented notion of what equity is, not seeking a careful definition but allowing for Apple's sliding signifier to do (see also Hart, 2003). Neither addressed the potential (or maybe the ramifications) of Weissglass' fifth view.

Demarcation of Difference at the Group

The Reyes and Stanic model makes clear their primary assumption that no significant differences in average aptitude exist between groups and that the range of individual difference within each group is similar. I doubt they would disagree if I pressed a bit further to say that the assumption holds no matter how borders separating groups are defined, whether by race, gender, class, or some other arbitrary boundary. Similar to most statistical work, these assertions are like null hypotheses that mean and standard deviation of any compared groups are the same. However, in

statistical reasoning the problem is to test the hypothesis that difference exists, while the model posed by Reyes and Stanic asks: What may be causal relations for why we see differences emerge among these groups that should show no difference? The aforementioned statistical work assumes the testing device is unflawed, while the model for understanding inequity opens this up for possibility. Because the model refuses that there exists any difference in the populations, I will next argue that it must be the measurement tool that creates difference.

I find this approach to work for equity in mathematics education, demarcation of difference at the group, problematic at two levels. The first, which I've begun to discuss above, is an unavoidable result of Reyes and Stanic's (1988) second underlying assumption—that "we live in a society where racist, sexist, and classist orientations exist in institutions and individuals" (p. 27). Any way that we may attempt to *measure* achievement is necessarily flawed, because any measure is racist, sexist, or classist—employing Reyes and Stanic's working assumption about our institutions and individuals. A measurement tool of a racist can yield nothing but prejudiced measures. That tool may be the skewed data collection, the underlying theory of the data collector, or the science of the society. Once Reyes and Stanic put in play the second assumption, all difference in achievement is expected. I don't note this problem as something to be changed in the assumptions or design of the model; it is a troublesome and often ignored condition of the postmodern (Lyotard, 1993/1979). To me, it calls for a different science.

The second, and greater problem is that of the group-oriented mindset.[19] *Naming* creates boundaries and emphasizes difference as definable structures (St. Pierre, 2000b). The author's wish to allow certain definable structures in children, namely race, sex, class,[20] but refuse that these boundaries correlate to differences in aptitude. I choose not to dispute that the phenomenon of grouping is necessary in order to operate in the world, or that race, sex, and class are powerful and pervasive ways that people group themselves or are grouped. Instead, it is my intent to deconstruct the binaries each of these groupings create. I seek to bring attention to the sedimentation of superior and inferior categories that a focus on naming difference brings into being, and thus perpetuates difference-oriented mindsets. I find iniquity introduced to the very structure of the model here. It is the normalizing of difference-thinking that propagates the continued emergence of difference. That it appears in racist, sexist, and classist ways reflects the power relations assumed to be in operation. The invisible and unavoidable assumptions we carry, those "folk theories about groups in the human family…are inextricably tied to relationships of power and dominance" (C. D. Lee, 2003).

Furthermore, this difference orientation blindly engages the machinery of humanist science; to study, classify, and build up a system of *what works*. If difference were quantifiable and finite, the teaching of mathematics could be scientized or engineered. Difference mindsets may allow for the engineering of education through a hierarchal-centralized-distanced concept of knowledge, knowing, and interaction. But I prefer to think of knowing as heterarchal-decentralized-personalized (Turkle & Papert, 1992). Teaching is not engineering; it cannot be designed in advance of the interaction, prior to the child. Each child in each classroom with each teacher on each day is a different person. And so is every teacher. The actual work of teaching amidst the singularities—the infinite difference—could never be engineered, a process seeking rules and generalizations. Instead, equitable educational relationships require a teacher unencumbered by intentionality, by logical action; a teacher freed to act spontaneously, naturally, and creatively as collaborator and fellow inventor (Davis, 1997). Answering *what works* in education ignores that people and context are involved. Prescribing remedies trivializes the role of interaction and relationship. The scientific mindset to repair the human relations (Weissglass, 1998) that are education, is a disrespectful and unjust position.

I have assumed that the purpose of Reyes and Stanic's model is to understand further the interactions and relationships between the categories of influences on student achievement. Ideally, the authors wish this understanding would move beyond correlation to recognizing and thus treating causal factors. I have argued above that the demarcation of difference at group will not yield a just approach to designing treatment for the iniquities of mathematics education; earlier I demonstrated that the causal answers sought are in fact established prior to the design of the model—racism, sexism, and classism, existing in our educational institutions and in individuals. 'Teacher Attitudes' affect 'School Mathematics Curriculum' because of racism. Sex stereotypes are the cause for "Student Achievement-Related behavior" to affect, and be affected by, 'Student Achievement.' The drive for enlightenment—the belief that through reason we can understand, organize, control—busies the modernist

scientist in the inactivity of purposeful activity. The oppressive *and* blinding *and* reproductive power of the structure makes even the hardest of workers and thinkers impotent to act. In mathematics education we continue to muddle along in tradition.[21] We are both blind to and frozen by our enforced passivity.

Agency

Often the trouble with theory that begins from a sociological point of view is that the agency of the subject, what I conceive to be the subject's perceived potential to act in and act on[22] the world,[23] is neglected.[24] In the case of the Reyes and Stanic (1988) model, there is not a demand for the researcher to attribute this (or any) sort of agency to the student or to the teacher or to the researcher herself—the people engaged in the interactions being studied. The model allows the researcher to make unproblematic the role of the observer, the tools of observation and measurement, etc.

**Resistance*

When asked, the authors replied that the concept of agency is everywhere in the model, but that it shows up as resistance. George read a passage of the paper that refers to Paul Willis' (1977) classic work *Learning to Labour*. "Critical sociologists like Willis would consider ignoring as a form of resistance, would look for a more complex interaction of acquiescence and resistance, and would look beyond the teacher for other sources of ideas being accepted and resisted. Indeed even *teachers* [italics inserted] must be seen as actors in a particular historical moment who accept and resist societal influences and the bureaucratic norms of schooling." Expressing distaste for "romanticizing agency", George notes that the resistance of the lads to the intended learnings of the teacher in *Learning to Labour* reproduced the inequalities that previously existed. "It is that not all resistance is a good thing that is interesting" (George).

Assuming the model does capture or allow for the agency/resistance of the of the learner and/or of the teacher, it is up to the researcher to name how it is working in the suggested causal relationships indicated by the arrows. For example, if School Mathematics Curriculum has a causal effect on Teacher Attitudes, the model then demands that the causal effect account for the agency/resistance of the teacher. An analysis of the interaction of acquiescence and resistance of the teacher may provide rich and personal material for educators to reflect and act upon. Further, the researcher holds the responsibility to unearth the ways in which the research methods account for her own agency in the establishment of causal relation.

**Resistance/Freedom of the Interview*

The Hart and Stanic interview itself was an interesting affair. Even prior to the interview, troubles of power relations, acquiescence, and resistance were brought to the table. I invited Hart and Stanic, during a study group meeting, to consider how to organize the interview. If interviewed together, would each other's responses influence the other's thoughts? Would one voice dominate the discussions? Although I was invited to "come at them", I was cautious in the design of the organizing interview protocol not to be disrespectful, single-minded, or singularly negative. I also felt that there should be opportunity to celebrate the occasion; Hart and Stanic each reflected that it was a very happy time in their career, to have thought and written together on a challenging and personally meaningful issue. During the interview itself, each lamented the desire for conversation with me, rather than allowing my assumed state as the quietly curious, uninvolved interviewer. In place of my voice during the session, I had (and am now exercising) the powered position to respond in a removed manner, free of the responsibility to engage in the interaction of the discourse of critique—a responsibility to my interview subjects as the authors of the ideas it felt as though I was staging for demolition. My space in the interview was a mocking silence, a set up of the subjects for the back-handed stabs I would take in the critique of their joyful work 2 decades ago.

The qualitative research interview is supposed to be an attempt to understand the subject's points of view and meanings assigned to experiences prior to scientific explanations of the subject (Kvale, 1996). This way of thinking of the interview maintains two distinct phases, actually doing the interview and then interpreting and explaining the experience. The interviewer can be thought of as possessing two roles, that of a miner seeking to extract ways of knowing, and secondly that of a traveler, wandering an unknown territory and returning home with a sampling of the terrain explored. These metaphors carry heavy modernist baggage, assumptions which fail to keep at bay notions of bound and stable meaning, in either the interview questions, the transcribed text of responses, or even the context and interaction of the setting (Scheurich, 1995). A postmodern perspective recognizes that both the

interviewer and interviewee have "multiple intentions and desires, some of which are consciously known and some of which are not" (p. 240). It is an artificial separation to segment data collection and analysis (St. Pierre, 1997). Rather than attempt to salvage rationality with the postpositivist notion that systematic research procedures can yield proper interpretation of data, I seek to flourish in the "wild profusion" (Scheurich, 1995) of the bedlam of possibility, the anarchy of indeterminance.

Coming to the interview, as the researcher I had these "multiple intentions and desires." Of course, the same was true for Drs. Hart and Stanic. Each of us may have withheld certain opinions, or been cautious in exercising some—as to not offend colleagues or each other. They questioned my asking of questions; they may have been wary of the context that a "critical analysis" of their work was to be undertaken, and that questions I asked may put their beliefs on the table for derision. At times, the interviewees asserted control over the interview, providing answers to unasked questions, leading a topic or eliciting from one another. The questions presented in the interview meant something different to me, as the interviewer, than they did to the interviewees. The generalizations and beliefs that I, as the researcher, have extracted and attributed to each subject appear as what they really meant, but are better thought to "mostly represent the mind-set of the researcher" (Scheurich, 1995, p. 241). With these sorts of awarenesses in mind, the resistances each of us took contributed to the always already "shifting carnival of ambiguous complexity" (p. 243) of interview interactions and analysis. It is in this play[25] of resistance that a different notion of freedom can be conceived.

When conceived in a dominance-resistance binary, "overtly oppositional work, while at war with the dominant systems of knowledge production, is also inscribed in what it hopes to transform" (Lather, 1991). Willis (1977) observed this in the lads of his study, through their resistance (Laurie and George's *agency*) they reinscribed the dominance of the social system. Resistance is not freedom, it is bound by and persists in conjunction with the persistence of dominance; "it is a closed determination" (Scheurich, 1995). In seeking to move beyond enclosing interaction within this dominance-resistance binary, Scheurich suggests a "chaos/freedom" (p. 248) for all that escapes this binary and represents the openness for the interviewer and interviewee. The radical openness and indeterminancy of language makes, and allows for, this sort of freedom. Agency conceived not as resistance, but as this chaos/freedom might be a more productive tool for acknowledging the subjects of equity research, student, teacher, and researcher. To explore the radical openness of the relationships among the boxed terms of the 1988 model may yield more value than seeking casual substantiation.

Implications

Differences in mathematics achievement have persisted in the twenty years since the emergence of Reyes and Stanic's work. The significant movements in the field during this time period—a technological revolution, the normalization of the constructivist model for understanding learning, and an increased focus on issues of equity and social justice (Wiliam, 2002)—have at best created changes that are "limited, fragile, and highly vulnerable to changes in government policy" (p. 476). Has Reyes and Stanic's model proved fruitless? Has it remained underutilized? Although it has not been the purpose of this paper to review the two decades of equity research since the emergence of this model, much work has been done in accordance with and in response to this model. However, if the model were to be presented today, little would need to change.

Changes to the Model

The 1988 model's organizational qualities serve well for ways to think about the differences in mathematics achievement based on student's race, sex, or SES. The critique offered in this paper emphasizes the need to surface epistemological, ontological, and axiological assumptions in the course of work with the model. Both authors agree, however, that since publication they have learned qualities of the dialogue necessary to bring a fuller engagement to changing the iniquities of mathematics education. Laurie expressed that she has become more aware of the need for support structures for teachers as they are asked to take on the demanding task of teaching equitably. George suggested that notions of *resistance* could be more fully developed. Both agreed that they have concerns about the impact of researchers and curriculum writer's attempts to create multicultural and more diverse curriculum, possibly creating differences that aren't there in the first place, or taking differences that are there and making them problematic. "That as soon as we begin to teach our preservice teachers about differences between groups of human beings, such as 'Latino kids and families are like this, black kids and

families are like that', we come pretty close to creating and perpetuating problematic stereotypes. So that the very thing that we are fighting against, we contribute to in some way" (George). Each of these qualities move beyond doing equity work in order to establish causal relations toward working to build the ark; they emerge from an orientation toward Freire's praxis.

So while no organizational changes may be necessary, the model should demand the disclosure and dissection of assumptions underlying the research work being done. The purpose of such efforts is to make explicit the varying viewpoints, rather than come to a unified perspective. Too often we currently work as though we all mean the same thing when we call for equity in mathematics education. I've demonstrated that there are a variety of and conflicting ideas about what equity means, and why mathematics should be taught. It is insufficient to think of equity as absence of inequity (Hart, 2003). Making a statement about the nature of mathematics *must* also be a part of any serious researcher's work. Dylan Wiliam (2003) demonstrates that our choices for defining mathematics is what keeps males outperforming females. "We are led to the conclusion that it is a third source of difference—the definition of mathematics employed in the construction of the test—that is the most important determinant of the size (and even the direction) of any sex differences" (p. 194). Drawing upon personal notions of both equity and mathematics, educators should question "their own taken-for-granted assumptions about its nature and worth" (Stanic, 1989). The goals of mathematics education are varied and often contradictory.

In addition to demanding disclosure of a theoretical position on equity, mathematics, and why teach mathematics, the model should ask of researchers to explore other assumptions about teaching and learning that impact student achievement. For example, because the model emerges from a critical sociology perspective (Reyes & Stanic, 1988), psychology and other sciences, as well as theoretical positions differing from critical, may productively inform the model's suggested correlations. By making different assumptions, for example, about what constitutes learning, or by locating agency or the subject differently, different ways to think will enrich the conversation.

While the structures of the Reyes and Stanic model may still serve as a guide to reasoned analysis of inequitable achievement in mathematics education, the model could communicate more by demanding thoughtful work on several levels it assumes. Popkewicz (2004), however, expresses skepticism in the field's potential to accomplish the model's goal, arguing that research "lack[s] the analytic tools to engage in a self-reflexive examination of the rules and standards that constitute questions of equity and justice" (p. 25). Twenty years of little or no progress seems to support his skepticism. As the field has worked for more equitable achievement results, experiencing the resistance to correction of educational iniquities increases our awarenesses that additional areas need the attention of our action.

Knowledge/Reflection/Action

The possible changes to the model considered above don't make problematic the prolonged effort to understand differences in mathematics achievement based on arbitrary group demarcations. I've also argued that the authors have made it a primary societal assumption that racist, sexist, and classist results would emerge. I contend that the causal factors sought by the model are exactly these: racism, sexism, and classism in our institutions and individuals. That is the cause for the interaction among each box of the model is racism, sexism, and classism.

What this model fails to contribute to mathematics education are theories for action. Steig Mellin-Olsen (1987) notes at the time of Reyes & Stanic's work that lacking theories for action had been a failure of the "Social 'Reproductionists' of the 1965-1975 period" (p. 193), a theoretical position that informed Reyes & Stanic's critical social theory. Dylan Wiliam (2003) also contends that current research in mathematics education is more concerned with finding cause rather than correcting these iniquities. Allowing for an essentialist positioning for the theorized causal relations of the model, it still holds that "one cannot deduce an 'ought' from an 'is'" (p. 205). Wiliam's point is that even if mathematics education research does establish that, for example, a classroom process such as student interaction in the context of collaborative group work on a rich mathematical task causes differential achievement among children of different socio-economic status, it tells us nothing about how we should teach. Research cannot tell us how to act.

Mathematics education, he argues, is not a field in which to apply the analytic rationality that seeks to establish universal truths. "The goal of educational research as a [hard] science… is not just elusive, but impossible" (Wiliam, 2002, p. 479). Instead, practical wisdom should be pursued. If practical wisdom—contextualized ways of knowing and operating—

becomes what research seeks to reflect back to mathematics educators, maybe research would no longer have to figure how to bridge a theory to practice gap. Respecting the knowledge construction and potential for reflection of the practitioner is, in essence, what researchers have been calling for the teacher to do in interaction with the student.

New Roles of the Researcher

To work as a researcher in such a way, would engage the researcher not in trying to identify, define or to understand (Bové, 1990) differences in achievement in mathematics education, but to act in ways to overcome these persistent iniquities. Whether this action be in classrooms with children, in professional development with teachers, or in budget meetings with policy makers, the researcher would be responsible to share the activity and observations with others, to provoke thinking, reflection, and connections. In this provocation to think differently through supported reflection, other practitioners may learn new ways to act (Weissglass, 1994).

Such a researcher would have a changed orientation to data, and would be guided by a new set of questions. Data would not serve to demonstrate how things are, but instead to provoke thought, discussion, and action. The researcher would not analyze the data to establish a coherent and scalable theme, but instead to explore the way apparent 'truths' are constituted within the particular frame of reference that contain them.

Those questions that we know so well, spewing from the humanist agenda to understand essence, will not serve us once we let go of the need to explain and have embraced a new goal to act. New questions would not mask links to power, control, desire, and coercion. Paul Bové (1990) turns us toward analyzing the discourse of the setting. Bove's discourse "is the organized and regulated, as well as the regulating and constituting, functions of language that it studies: its aim is to describe the surface linkages between power, knowledge, institutions, intellectuals, the control of populations, and the modern state as these intersect in the functions of systems of thought" (pp. 54–55). Questions become not only for the researcher, but also of the researcher, how the researcher returns the data to the audience. How does discourse function in this mathematics classroom? How has this discourse been produced and regulated? What are its social effects? How does racism function in the relationship among 'Teacher Attitudes' and 'School Mathematics Curriculum'? This new role of the researcher positions her differently to the data and creates new intentions for the use of the data. The goal is no longer dissemination of findings, or knowledge transfer. The audience is recognized not to be passive adopters of good ideas, but as active creators of knowledge (Wiliam, 2002).

**An Emergent Thesis*

The research interview (and I suggest all forms of research, in that all interaction is a variety of discourse production) is marked by its radical openness. It is the ambiguity presented by the unknowable ordering of reality that unmasks the significance of human interaction. This interdeterminancy brings forth a people-centeredness that had been incapacitated by the modernist structures of schooling, knowing, and science. Reconsidering the expert, "the ability to act quickly and intuitively in a range of contexts and settings is unified into a 'feeling' of the right thing to do…. Expertise is therefore not the culmination of rationality, but transcends it…. It is not irrational but meta-rational" (Wiliam, 2002, p. 483). If the radical openness of the interview, and other learning relationships, can be reconceived to step aside from the drive for analytic rationality, there is a new potential for an ethical and equitable education.

Considering pursuit of this new thesis, what conditions might be necessary that encourage interaction to refuse the appropriative, habitual, patterned character of human interaction? First, confidence and competence in one's own ideas and thinking—a version of agency—are essential, but incomplete without the coupling of an awareness of the fallibility and the perpetual incompleteness of these ways of knowing. Second, valuing others' confidence and competence in their knowing and regarding their knowing as not identical to one's own is necessary. I consider this to be conferring an independent existence on others. Regarding other's knowing as not identical to one's own always keeps in play possibility. I consider these conditions to be organizing principles for a people-centered approach to interaction and to science.

Such an orientation impacts work for equity in mathematics education because these principles encourage participants in equity work to problematize how grouping happens. The principles open the way to forming judgments and generalizations about others founded on qualities other than how one looks or where one lives (White, 2002). Furthermore, they acknowledge the tentativeness of all judgments and generalizations, thus contributing to efforts to

rethink how we group. They remind us that we are meaning makers, authors—not vessels (Freire, 2002/1970), knowledge-makers—not -receivers. Mathematics is not a static subject, but human living. The principles remind us to both live in our worlds, but to doubt our assumptions. We wonder what is equity? They remind us to exist beyond "tradition and habit" (Laurie & George); and thus *Why teach mathematics*? remains an open question. They maintain a state of affairs in which comfort is achieved not in things being as you predict, but in the constant surprise that is the chaos (Scheurich, 1995, p. 252) of our relations.

Conclusion

The ambition of Reyes and Stanic's model has not yet been realized. On one level, the field of mathematics education has yet to find a complete set of answers to how each node of the model affects the other. More importantly, the aim to eliminate differential achievement in mathematics has not been attained, and arguably has been at a standstill. In this paper I have argued that the enforced passivity of the institution and individuals of mathematics education perpetuates these iniquitable outcomes. Attempts to understand cause and effect get blurred by the circular causality of power and privilege, manifested as racism, sexism, classism. The normalizing operations of structures, whether these structures be thought of locally as the busy-ness of daily work, or the unexplored assumptions of science, blind us to possibility.

In this essay, I have suggested a general principle for equity in mathematics education work: to foreground the open indeterminancy of research interaction. Such an attitude would require greater attention to taken-as-shared assumptions, such as *Why should we teach mathematics?* and *What is equity?* The researcher's role in demarking groups, as well as the affordances and constraints that emerge, would be a topic of the research. A new conception of the agency/resistance/freedom of the subject in its co-construction of the social may bridge varying orientations, theories, or sciences. I have considered these possibilities not to lay forth *the* path toward equity in mathematics education, but instead to consider new possibilities.

What I suspect may be most necessary for mathematics education to attain socially just outcomes is to allow itself to reconceive its neurotic drive to prove its worth. The field simultaneously ratchets up what it means to know mathematics (keeping at bay the lived disagreement of the general populace) and says all kids must know *this* mathematics (maintaining its existence), while it judges children's attainment of mathematical knowledge (thus serving in the meritocratic stratification of children) and flaunts an egalitarian notion that mathematics is constructed (evaporating its own responsibility for educating toward its standards). Instead of asking how we can *teach mathematics* equitably, we should begin by asking how we can *teach for equity and social justice*. And because mathematics is what we do as humans, a mathematics education will emerge.

*Coda

The interview experience ended much as this paper has ended above. There is much more to say; it is only the ways in which we occupy time and space that demand an ending point. After two hours of interview, the three of us had much more to say—meaty ideas were beginning to emerge for discussion, debate. In the same way, space limits for publication forced the arrival at the conclusion above. Yet as part of writing I have been encouraged into additional connections, thoughts, imaginaries. Poststructural writers persuade us to "ask questions about what we have not thought to think, about what is most densely invested in our discourse/practices, about what has been muted, repressed, unheard in our liberatory efforts" (Lather, 1991). It is with Patti Lather's admonition that I write this "messy text" (Marcus, 1994, p. 567), an uncooperative text that challenges reader entitlement to know, holding at bay the desire to retreat otherness to sameness.

As we closed the interview, each person sought to insert final thoughts. In fact, Laurie asked me to reactivate the audio recorder for her comments. It is again in these instances we see resistance to the perceived structures of discourse and interaction take place. As we discussed the persistent iniquities of mathematics education, I found that we were mired in our positions of power and privilege. I wondered as we sat in a room larger than some of our students' sheltered living spaces, using our "working" time to engage in talk, what is it that three white academics—powered, privileged, and distanced in a racist, sexist, classist society—don't and can't know when we think to prescribe work for equitable mathematics education? What are the ways that we are hindered from attaining just achievement outcomes? In what ways has our work kept in place the persistent iniquities observed twenty years ago?

Laurie Hart has experienced the same struggles. But too has had many successes

and positive interactions and relationships. In closing, she noted that equity work in mathematics education is still marginalized, yet she is inspired by and excited for the current people working on these issues.

And to give the last word to George Stanic, he recalled the hopeful end he and Laurie wrote to their paper in 1988, what he believes is the main message of *Race, Sex, Socioeconomic Status, and Mathematics*: "There is clearly much work to be done to prove that group differences in mathematics achievement we now see do not reflect the natural order of things" (Reyes & Stanic, 1988, p. 40). "Our message in the paper is that what we have now is *not* the natural order of things, and that we can make it better" (George).

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[1] Consider a sampling of "movements" in mathematics education, from the early twentieth struggles between the humanists, developmentalists, social efficiency educators, and social meliorists (Stanic, 1986) through the eras of "new math", "back to the basics", the "new-new math" and the modern response known as the "math-wars" (Wilson, 2003).

[2] I've adjusted Danny Martin's (2003) approach by one year to reference readily available NAEP data.

[3] Praxis, the practice of reflection on knowledge that leads a learner to act, is what changes the world (Freire, 2002/1970).

[4] For example, during the early 1930's L. P. Benezet (1935a; 1935b; 1936), a New Hampshire school superintendent, conducted an experiment in which he dropped the formal teaching of arithmetic until the 7th grade. In carefully conducted studies, he found that students involved in such classrooms were able to attain the level of accomplishment in one year that took traditionally taught children three and one-half years of arithmetic drill.

[5] The Ad Council currently runs a campaign to entice girls to do well in mathematics called, "It's her future. Do the Math" (See the website http://www.adcouncil.org/campaigns/girls_go_tech). Again, reading for the unstated message, 'if you don't do the math, your future is in jeapordy.'

[6] These efforts, to me, are often emerge from the Piagetian and Vygotskian traditions, being not quite satisfied with either because of humanist ontological assumptions. Among postmodern psychologies are von Glasersfeld's (1995) radical constructivism, Bateson's ecological position (1972), Papert's (Harel & Papert, 1991) constructionism, and Kieren et al's (1995; and also Davis, 1996) enactivism, and possibly some 'social constructivisms.'

[7] My thinking on this idea was sparked by Weissglass' discussion of this notion in the context of learners (1991, p. 291), but I also draw on Foucault's (1997/1984) notions of power relations, that both subjects in relation possess power. I disagree with Weissglass' notion that passivity increases as SES decreases. While in a direct way this may be true, but as I attempt to argue here, I believe the inverse relation also holds; enforced passivity to the powered is also detrimental.

[8] Lee, Spencer, and Harpalani (2003) replace this cultural deficiency misconception with a model to integrate cultural socialization and identity development processes into learning as a goal of educational research.

[9] Hill, Rowan, and Ball (2005) argue students could learn more if teachers were better prepared, in particular if their "teacher's mathematical knowledge" improved.

[10] I am arguing that the status of mathematics education allows us to work unquestioned, unbridled. Yet our status also busies and detracts us with demands for justification—a sort of status maintenance. This sort of paradox I have come to expect in efforts for analytic rationalization.

[11] Reyes and Stanic's model is reprinted with permission of JRME, copyright 1988 by the National Council of Teachers of Mathematics. All rights reserved. It is not an exact duplicate in that I wished to acknowledge the two changes George suggested ("Other than that, I'd keep this baby just as it is.") In the final JRME publication, an arrow tip was lost from Student Achievement to Student Attitudes. I also

added a space between the comma and the 'and' in the bottom-most box.

[12] Laurie Hart Reyes today uses the name Laurie Hart, which I will use for the remainder of this essay except when referencing the 1988 JRME paper.

[13] Later I will argue that the stage for this difference orientation is laid when Reyes & Stanic proposed their model, structuring the focus of future thinking on the impact and interaction of race, sex, and SES on mathematics education.

[14] Black and Wiliam (1998) demonstrated the success of such a practice with their formative assessment project in the U.K. Boaler and Humphreys (2005) released a multimedia text focused on helping adolescents build connections between mathematical ideas and representations which also has potential to engage teachers through concrete and living examples.

[15] "Late in his career, Mr. Derrida was asked, as he had been so often, what deconstruction was. 'Why don't you ask a physicist or a mathematician about difficulty?' he replied, frostily, to Dinitia Smith, a Times reporter, in a 1998 [interview]" (Kandell, 2004, p. 1).

[16] Consider the following resources for a nice range of responses to the justification question (D'Ambrosio, 1990; Davis, 1995; 2001; Ernest, 2000; Gates & Vistro-Yu, 2003; Greer & Mukhopadhyay, 2003; Noddings, 1993; Skovsmose, 1994; Stanic, 1986).

[17] Paul Ernest also wonders if we *need* mathematics by pointing to the seemingly obvious 'relevance paradox' Hart and Stanic mention here, that there is this "simultaneous objective relevance and subjective irrelevance of mathematics in society" (Ernest, 2000).

[18] A colleague recently pointed out that the root of educator is educe, meaning to draw out.

[19] Is it human nature to draw boundaries through which to organize patterned experiences? Or is it a function of our cultured upbringing?

[20] Secada (1992) notes that the phenomenon of grouping itself is often ignored and that how we group requires deep examination when considering the nature of equity and what it means to work for equity. Of course scholars are deconstructing the walls each of these grouping binaries establish, a prominent example appearing recently in The New York Times' lengthy focus on the new designs of class in America (Scott & Leonhardt, 2005).

[21] A notion brought out by both Laurie and George.

[22] This is my interpretation of Freire's *write the world* (Freire & Macedo, 1987).

[23] Whether the subject perceives this world as having an existence, either prior to or as a result of her constructive interactions.

[24] I recognize that trying to name agency is humanist project (St. Pierre, 2000b); "The meaning of agency is unknowable and must be deferred" (p. 505). However, I cannot help but to confer an existence on others, and with that I seek to think about an agency associated with their knowing which is different from my own. This agency necessarily is unknowable to me, and what agency I do attribute in any instance is "the invocation by which a subject comes into linguistic being" (St. Pierre, 2000b).

[25] "Play is the disruption of presence" (Derrida, 1978).

Mathematics Education Student Association
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