

Challenging the Inevitability of Difference: Young Women and Discourses about Gender Equity in the Classroom

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ABSTRACT

Debates about achieving gender equity in education have largely been conducted along a single axis, swinging between two questions: Are girls and boys fundamentally the same or different? Consequently, should girls and boys be treated similarly or differently? This article grounds these theoretical debates about approaches to gender equity in the experiences of one group of female high school students' struggle to achieve gender equity in their mathematics education. An analysis of students' talk yields that the young women and their male peers understood the relationship between gender and educational equity through competing discourses. Thus, this case study provides a grounded critique of the dominant paradigms for understanding gender equity and helps reframe the kinds of questions and conversations that practitioners, students, families, researchers, and policy-makers might pursue as they search for remedies to educational inequities. At the same time, although this particular case study focuses on competing discourses about gender, these discourses mirror other debates in feminist, multicultural, and critical race literature about the relationship between race, class, and disability, and approaches to equity. Thus, this article holds implications for how we understand the relationship between differences (race, gender, class, and disability) and educational equity.

INTRODUCTION

Frogs and snails and puppy-dog tails, that's what little boys are made of.

Sugar and spice and everything nice, that's what little girls are made of.

Children's Nursery Rhyme

I don't know if guys feel the same way about having it be such an important thing to give right answers. It seems to do with testosterone. [T]here's a really big

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difference between men and women's brains. I'm not saying I don't have the capacity. I'm not saying I'm not able to. I'm just saying my brain has a different—is not the same as these boys' brains. I'm not saying it's less good. I'm not saying it's better. I'm saying it's different. And I can be expected to learn things in different ways.

Meredith, Student at City Academy¹

Words like “testosterone,” “brains,” and “natural” are sprinkled liberally throughout talk about gender these days. Meredith, a student in her final year of secondary school, spoke of gender differences in terms that would not sound unfamiliar or jarring in many contemporary educational environments. Males and females, it is often proclaimed, are made of fundamentally different “stuff.” Females are all “sugar and spice”—verbal, teacher-oriented students. Males are squirmy, testosterone-driven, abstract-thinking, naturally competitive beings. Although this might strike some as either folklore or early 20th-century science repackaged for a contemporary audience, there is one critical difference: in many school contexts, this type of discourse² with its emphasis on difference is offering practitioners and students a discursive position from which they imagine and work to create more equitable educational environments for males and females.

Debates about achieving gender equity in education have largely been conducted along a single axis, swinging between two questions: Are females and males fundamentally the same or different? And, consequently, should females and males be treated similarly or differently? Although this perpetual debate about sameness versus difference has been theoretically challenged as misguided (see, e.g., Fine & Addelson, 1996; Hare-Mustin & Maracek, 1990; Scott, 1988), it has not yet been put to rest either in the academy or in the daily practices of schools. Many feminist scholars have long argued that different, more critical questions must be asked: How is difference produced within and through the curriculum, pedagogy, and institutional arrangements of schooling and how might these be reshaped to combat inequity (see, e.g., Fine & Addelson, 1996; Johnston & Dunne, 1996; Walkerdine, 1990; Willis, 1996)? However, these questions are rarely voiced in actual schools, drowned out by the deeply entrenched tendency to ask questions about the existence of similarities and differences between males and females.

In this article, I ground these theoretical concerns in the story of one group of female secondary school students' struggle to achieve gender equity in their mathematics education. I analyze students' discourse about their advanced math track, focusing on three competing interpretive frames through which they came to understand the “problems” of gender, mathematics, and equity. This group of young women drew directly and primarily upon what I am calling *difference-talk* to provide a language for

challenging educational practices that they found to be discriminatory. To a great extent, they focused on the perceived differences between male and female learning styles, interests, and needs in order to make an argument for a different kind of mathematics education. In response, most of the male students countered the young women's analysis with a discourse of meritocracy. Finally, some female and male students voiced a third, albeit fainter, theme that called into question several fundamental assumptions guiding the curriculum and pedagogy of their mathematics classroom. Positioning the "problem" of gender and mathematics education very differently, these three interpretive frames implicated conflicting ideas about reform in the classroom.

Gender equity in the mathematics classroom is a well-explored area of feminist research, theory, and reform in education (see, e.g., Becker, 1995; Boaler, 1997; Johnston & Dunne, 1996; Willis, 1995, 1996; Walkerdine, 1998). Because of its gate-keeping role opening opportunities to advanced study, scholarships, and burgeoning job markets (see AAUW, 1998; Walkerdine, 1998; Willis, 1995), mathematics has rightfully been the subject of choice for many gender reformers. Gender reformers have focused their efforts on the curriculum, pedagogy, and social position of mathematics education (see Kenway & Willis, 1998; Walkerdine, 1998; Willis, 1995). They have been deeply attuned, for example, to biases on the part of teachers and administrators (see, e.g., Fennema & Peterson, 1986; Hyde & Jaffee, 1998) and the importance of recognizing and supporting a variety of gender-inflected learning styles (see Boaler, 1997; Becker, 1995). Recent research suggests that some of these efforts have encouraged female students to stay with mathematics longer; however, the data also indicate that young women continue to end their mathematics education earlier than their male counterparts and they remain underrepresented in the advanced levels of high school math (AAUW, 1998; Boaler, 1997).

This article contributes to the research on gender equity and mathematics education by documenting how one particular group of students came to understand, and contest, the meaning of gender equity in their precalculus and calculus courses. I offer this analysis of students' perspectives from my position as a feminist anthropologist of education listening for how our interpretive frameworks shape our understandings of, and approaches to, gender equity. As such, I am looking at the mathematics classroom from an outsider perspective.

In what follows, I begin by describing the particular story from which the data for this article are drawn. This story is followed by a close examination of the three competing discourses that students voiced as they sought to interpret their experiences. Finally, I discuss the implications this story holds for how we can frame, with and for students, critical analyses of gender equity in and beyond the math classroom.

RESEARCH METHODS AND SETTING

Research Methods

City Academy is an elite, co-educational independent school located in a major U.S. city. The school enrolls a total of 900 students from kindergarten through 12th grade. City Academy defines itself as an institution that aims to prepare its students for entrance into the most prestigious colleges and universities. My research at City Academy was part of an ethnographic study I conducted at two schools. In that larger study, I was concerned with the range of discourses about difference that were employed as practitioners at each school investigated, challenged, and renegotiated their assumptions and practices in relationship to specific aspects of diversity (Abu El-Haj, 1998). At City Academy, practitioners were concerned, in particular, with issues of race³ and gender.

In this article, I focus on discourse about gender that emerged within the context of the school's advanced mathematics track. The young women had raised critiques of their mathematics education in the spring of their third year of secondary school (junior in U.S. terms). It was in the fall of their fourth and final (senior) year that I began my fieldwork at City Academy. To understand better the young women's critiques, several teachers and administrators asked me to interview the students and to observe their senior-level advanced mathematics class. Beginning in early November, I observed the calculus class once a month for a total of eight visits. I conducted focus group interviews with the young women in the class in November and February and, in March I invited them to speak in a multicultural education course I was teaching at the time. Finally, in May, the calculus teacher, the head of the math department, the director of curriculum, and I conducted single-gender focus group interviews with all of the students. We made the decision to divide these focus group interviews along gender lines because our prior experiences with that particular group of students suggested that the atmosphere in mixed-gender groups was likely to be unproductive or painfully disrespectful of dissenting perspectives. In this article, I analyze the students' discourse from the focus group interviews conducted over the course of the year and from the young women's presentation in my course. I explore how students interpreted the relationship between gender, mathematics, and equity. Although I draw upon my observational data to provide a context for the students' discourse, the unit of my analysis is the students' interpretive frameworks represented in the focus group interviews.

The School Context

It is within the context of the school's mission to prepare students for the most prestigious institutions of higher education that the young women's

experiences with mathematics must be understood. The young women were enrolled in City Academy's advanced mathematics track. Mathematics was the only area of curriculum at City Academy that was tracked. Further, the calculus course was the only class in the school that explicitly followed the curriculum of the College Board's Advanced Placement examinations (AP). The Advanced Placement examinations are national tests that high school students can opt to take in order to gain either advanced placement or course credit upon their matriculation into U.S. colleges and universities.

The advanced math track had an interesting history. A few years prior to my arrival at the school, a small group of vocal parents demanded that the mathematics department change its newly reformed curriculum. In the recent past, the department had engaged in developing a broader, more holistic approach to the teaching of mathematics that integrated, for example, reflective writing and more problem-based learning into the curriculum. This reform effort had drawn on the National Council of Teachers of Mathematics (1989) new standards for math education. In response to this program, a small group of parents concerned that their children would not be adequately prepared for college-level mathematics, formed an independent committee, wrote a math curriculum, and presented it to the math department. As Mike Knight, the school's director of curriculum, explained to me, the mathematics department, in the midst of a transitional leadership, had responded to "the parents' command 'jump' with 'how high?'"

Since that time a new department chair had sought to build a curriculum that would satisfy the demands of those families who wanted an accelerated math program that prepared students directly for the AP examinations and, simultaneously, would lessen the burden of academic tracking for those students who had been designated less proficient in math. The department chair, Alex Worth, explained to me that when he arrived, he had found a school with three math tracks: "advanced," "regular," and "R.T.," which many students had dubbed "retardo math." Over the first three years of Alex's tenure, the math department had been phasing out the "R.T." track. It had instead created a new course entitled "algebridge" for students not considered sufficiently prepared to take algebra in eighth grade. Algebridge was designed to help students whose math skills were deemed weak build a strong conceptual understanding of algebra through a more constructivist approach to learning. This was the one area of the upper school mathematics curriculum that had sustained the spirit of the earlier reform efforts. Algebridge students would join the regular math track by taking algebra in ninth grade. Thus, although the new system had reduced the number of lower-track courses, it maintained a two-tiered differentiation between regular and advanced math.

The Classroom Context

In the spring of their junior year at City Academy, a group of six young, white women⁴ approached members of the administration to demand that something be done about their precalculus math course. The young women argued that a hostile and competitive environment fostered by their male teacher and a small cadre of their male peers denied them equal educational opportunity. Further, they insisted that such a setting could not accommodate women's preferred learning styles and desire for connected ways of knowing (Belenky et al., 1986/1997).

At the end of their junior year, these young women proposed an alternative format for their math course for the following year. Drawing upon an established tradition at City Academy, the women sought to learn mathematics in the context of a peer-led independent study. They detailed clear criteria for how students would be invited to join the group, which included a strong interest in mathematics and a commitment to peer learning and peer teaching. The students planned to use the school's established curriculum and to be subject to the same midterm and final examinations as the regular advanced class. However, the math department faculty members were concerned that the course material was too difficult for an independent study and thus rejected this proposal. The math department chair and the director of curriculum, both white men, felt that the calculus teacher, Marilyn Davis, a recently hired African-American woman⁵ and a brilliant mathematician would be able to make a connection with these young women and rebuild their confidence and relationship with mathematics.

When the junior women raised critiques of their advanced math course, several teachers and administrators became deeply concerned about, even as they were puzzled by, these accusations. To the practitioners' knowledge, there had never before been any questions of gender inequity in the advanced math track. They acknowledged that these women's math section was unusual as male students outnumbered females, fifteen to six.⁶ However, in general, the school's advanced math track enrolled girls and boys in equal numbers or had girls outnumbering boys. Further, teachers and administrators reported no prior accusations of gender inequity from female students. Moreover, despite their critiques, all but one of the women in this section were performing well as measured by their grades and confirmed by reports of their teachers and the mathematics department chair.

It was two months into the school year that Marilyn Davis first invited me to speak with the young women and to attend her course. She wanted help understanding the troublesome atmosphere that pervaded the course. At the beginning of the year, Marilyn and several administrative colleagues had hoped to create a more positive learning environment by having students consciously examine the variety of agendas and

learning styles that they each brought to the group. However, after an initial class meeting during which each student shared hopes and goals for the course, this attention to group process had, according to both Marilyn Davis and Mike Knight, the school's director of curriculum, fallen victim to the overpowering demands of the AP calculus curriculum. As the course proceeded, the previous year's struggles resurfaced. Marilyn and the administrators noticed that class tone was contentious and students seemed frustrated and apathetic. Finally, in November, Alex Worth (the department chair), Marilyn Davis, and Mike Knight (the director of curriculum) decided to split the course in two, with one section preparing for the AB section of the Advanced Placement exam, and the other for the BC section.⁷ They hoped that this division would improve the classroom climate as each section could serve the different needs and demands of the students. The further tracking of the advanced section placed most of the young women (four out of six) in the lower section. One female student dropped the course.⁸ The classroom climate in both sections remained contentious. It was at this point that Marilyn Davis asked me to interview the young women and to begin attending her class.

In my observations, I attended to the classroom dynamics and pedagogical approaches as these had been the areas of concern for the young women. Since the focus of my research was the discourse about gender, my observations were aimed primarily at providing a context within which to understand the students' talk. My observations of both sections of the class served to confirm the young women's descriptions of their math class. The classroom climate, created primarily by a small number⁹ of the male students, was often combative. For example, during one observation, two male students were relating the calculus problem to an area of physics. Meredith, the young woman whose quotation opens this article, stated that she did not know what they were talking about since she was not taking physics. One young man quipped, "That's because you're too stupid," while the other simultaneously said, "You couldn't hack the physics." My field notes reflected numerous examples of students (mostly female, but including a few males) referring to themselves or their questions as "stupid." In both sections of the course, a small cadre of seven men expressed their intolerance of their peers' questions by, for example, referring to peers' questions as "stupid," stating that the questioner should "know that," or rolling their eyes and sighing. Further, this same group of male students repeatedly challenged Marilyn Davis, for example, critiquing the techniques she used to solve a problem or the marks she had given them on a test, in tones that were remarkably dismissive and patronizing. Marilyn Davis was deeply troubled by the tone of both sections of the class; however, she found it extremely difficult to interrupt. She perceived her authority to be challenged in ways that felt intimately interwoven with the dynamics of race as well as gender.¹⁰

In addition, Marilyn Davis felt the overarching pressure to prepare her students adequately for the AP examinations. As a result, the classes were driven at high speed by the need to prepare for a series of examinations—all mini-steps building toward the AP exam. Based on more traditional pedagogical approaches, during most of the class periods I observed, either Marilyn Davis reviewed homework and solved equations at the board or she called on individual students (both male and female) to demonstrate solutions for their peers. I only once saw small groups of students in the AB section working together on calculus problems as Marilyn circulated helping each group. This occurred late in the year as students prepared to take a test the next day. However, during this class period, all but two students seemed distracted, paid little attention to the task at hand, and generally engaged in conversation about other topics (e.g., the upcoming prom). By the middle of the school year, most of the students (male and female) appeared apathetic and distracted in class and by the end-of-the-year focus groups, many described themselves as frustrated and unsure of their knowledge of math.

In the end, out of the remaining 21 students, only five men chose to take the Advanced Placement exam. The female students felt their concerns had been ignored at the peril of their sense of themselves as mathematically capable. As a woman and a person of color, Marilyn Davis had also worked hard to make a place for herself in the field of mathematics. She ended the year feeling frustrated and demoralized at not having been able to have the girls see her as an ally.

INTERPRETING EXPERIENCE

Having sketched the context within which this story occurred, I turn now to an exploration of three frameworks through which students interpreted their experiences in the advanced math track. First, I examine the primary discourse through which young women understood their experiences—what I have called difference-talk. Next, I analyze the response that the majority of their male peers had to difference-talk. This discourse represented a backlash against a gendered analysis and called upon a belief that education was a meritocracy rewarding those who worked hard. The final section discusses students' faint, but more far-reaching, critique of education.

Difference-Talk and its Discontents

Initially, as they sought to understand their experiences, the young women read and drew upon feminist critiques of gender discrimination in schooling. In large part, they came to think about their experiences in terms of

a mismatch between women's learning styles and those valued in their classrooms (see, e.g., Belenky et al., 1986/1997; Gilligan, Lyons, & Hanmer, 1990).

Echoing Boaler's findings (1997), these women demanded that understanding be central to their math education. However, unlike the women in Boaler's study, these students made their argument on gendered terms. They proposed that as women they desired less competitive and more collaborative opportunities to learn with their peers. They suggested that given their verbal strengths, writing might be used in math courses as an important medium for making important connections and building deep understandings of mathematical concepts. Moreover, the young women described a need for more concrete and meaningfully related explanations of mathematical concepts. For example, Meredith spoke of her need to "understand a concept from the bottom part where it starts. I understand this is a circle and then you build on that . . . It's a verbal explanation. You know why you're doing this." Meredith desired to understand the relationship between each foundational concept and the purpose of the work. For Meredith, talk—"a verbal explanation"—supported learning and understanding. Rachel continued:

Yeah, and the connection to something physical. Some kind of tangible. Using real world examples . . . My brain can picture a rocket and completely understand everything going on. But my brain won't look at a tangent line and see exactly the same thing. It's easier for me to do it through something that I can picture and envision. To use common sense.

"Common sense," concrete and real-world uses, and pictorial examples marked many of the female students' ideas of necessary components for successful learning of mathematical concepts. In these and other examples, the women called for a curriculum that would draw on their strengths, emphasizing relationships between conceptual and applied knowledge. (Willis, 1995, for example, discusses calculus reform efforts in Australia that reflect such an approach to transforming mathematics in relationship to gender equity.)

However, given a discipline that dichotomizes and then hierarchically organizes "concrete" and "abstract" (see, e.g., Walkerdine, 1990), these students' demands for a curriculum more focused on understanding related to the "real world" was reinterpreted by some of their male peers as "the problem of girls in math." One overarching theme that emerged from the focus group interviews with the male students reflected a positioning of the women as less capable. As one example of how this positioning occurred, several of the male peers misread the women's desire to gain a more holistic understanding of mathematics as a cry for a cookbook approach to the discipline. One student, George, discussed the "problems" of girls in math and science classes:

Most of the females who have problems—most of the people who've had problems with the math and science courses have been females. And most of the people, most of the girls have wanted to just have things spelled out for them, told exactly how to do it and not have to really think for themselves. They want to do the old type of problems, like this is how it works, just change the numbers around and do the same exact thing. I've heard students comment, "we weren't told how to do this." You're supposed to figure out how to do this. That's the whole point. I definitely don't think all the girls are like that, but that is a trend that I've noticed.

George, echoing similar beliefs expressed by several of his male peers, argued that young women had "problems" with math and science because, especially in the face of increasingly difficult and abstract material, most females sought simple, patterned solutions rather than attempting to "figure it out for themselves." Thus, Rachel's call for a "connection to something physical" and Meredith's demand to "understand a concept from the bottom part where it starts [through] a verbal explanation" were reinterpreted and denigrated as a plea for received recipes.

Further, in an environment where maverick independence was of highest value, the women's desires for cooperative learning fueled the idea that they were less capable math students. In the all-male focus groups, young men repeatedly spoke about female students as dependent, rote learners in comparison to males, who were perceived as independent, problem solvers. When talk focused on gender differences, it was the women, rather than the curriculum or pedagogy of math courses, who were scrutinized and identified as lacking.

At times this talk about difference slid inexorably toward biological essentialism. Difference-talk reads gender as dichotomous and located in the materiality—the very body and brains—of male and female students. The focus on women's versus men's learning styles glided all too easily into talk of "brains," "testosterone," and "nature." Recall Rachel's words from above that her "brain can picture a rocket . . . but won't look at a tangent line." Her brain embodies a difference that is simply not of her making. Returning to the quote that begins this article, Meredith stated that boys are more willing to experiment publicly with wrong answers and argued:

It seems to do with testosterone. I'm dead serious . . . this comes from my dad (a scientist)—there's really a big difference between men and women's brains. And I've just accepted that my brain doesn't—I'm not saying I don't have the capacity . . . I'm not saying it's less good. I'm not saying it's better. I'm saying it's different. And I can be expected to learn things in different ways. My brain works differently, I mean my verbal capacity is higher than my spatial capacity . . . That doesn't mean I shouldn't be able to do well. It just means I need to be taught differently. That I need a little more time. I need to have it acknowledged that my brain is different. It can't just look at the board and see the connection and make it. I need to have it explained. I'm a teacher-oriented student . . . I can't teach it to myself. I don't have that capacity.

Thus, on occasion, biological differences were called upon as explanations for the differences in female and male academic performance. Testosterone was responsible for men's willingness to take public risks. Like Rachel, Meredith described her brain as an independently acting entity: "It can't just look at the board . . . It needs to have it explained." Her difference was out of her control, located in the very materiality of the body. Despite Meredith's insistence that different does not equate with better or worse, smarter or less capable, she flagged some areas of difference that were viewed within the context of the math course as signs of deficit. Needing more time and being more dependent on the teacher for explanations became markers of deficiency within a context in which speed, independence, risk taking, and the capacity for abstract thought were of the highest value. As long as difference is located in particular bodies, rather than in the invisible values and assumptions structuring curriculum and pedagogy, difference doubles as deficit (Walkerdine, 1990, 1998; Willis, 1995, 1996).

Within the discourse of difference, women's learning styles (see Belenky et al., 1986/1997)—whether attributed to biological or social origins—are positioned as antithetical to those of males. If women seek connectedness and cooperation, men are perceived to be drawn to risk taking, individualism, and competition. Describing his peers, Andy stated:

There's a guy's group that has an edge because of whatever—whether it's because they're trained to be that way or because they're really good in math, they spend more time studying it or because they're such a tight knit group that they have an edge. They really, I think, enjoy the edge. Nobody's trying to sabotage anyone. We're not ripping off people's homework or destroying people's calculators. I don't think it's competitive in that anyone's trying to defeat anyone else. It's just they like being one up. They like that energy. I like being better than people at something. It's natural.

Living on the edge and being better than others—all in good spirit, of course—are described as natural proclivities of a "guy's group." Competition is the unstated norm. By claiming no material injury (to calculators or homework) and positioning the desire to be "one up" as a natural or socialized tendency of guys, Andy obscured the interaction between the competitive atmosphere of the "edge" and a classroom environment that the female students did not find conducive to learning. For the young women, the "energy" that Andy described as driving his male peers created an environment in which they felt silenced and edged out of the opportunity to learn.

If competitiveness was intimately bound up with masculinity, so too was "natural talent" for mathematics. Although I heard both students and practitioners speak of the young women as capable math students, it was only a select group of young men who were described as being mathematical geniuses (see also Hyde & Jaffee, 1998; Walkerdine, 1990, 1998; Willis,

1995). Further, because being a “genius” and competitive interactional styles were viewed as independent qualities endowed to certain young men in the group, the inextricable link between the two was missed. For example, Janie described her classmate, Rob, as follows:

This one kid was like a math genius, got in early to [an elite math and science university], whatever. He would yell at us if he felt that he was right. And someone would ask a question and he'd be like, “Well, if you don't understand that!” The one problem with him—I mean it's horrible to condone what he did, but the problem was he totally knew everything and he did understand it all.

In this description, being a math genius was uncoupled from, rather than intimately bound up with, behavior. It is likely that by participating in and policing a competitive classroom environment in which questioning was not tolerated, a small group of students had secured knowledge, confidence, and academic success for themselves at the expense of many of their peers.¹¹ Thus, locating gender and its consequent modes of interaction in particular bodies failed to expose the ways the pedagogy and practices of the advanced mathematics track might have created and maintained inequities. Furthermore, for several years a particular group of seven boys had created this kind of atmosphere without any effective intervention on the part of their teachers. In fact, this group of boys had a reputation throughout the school for having acted in these ways since kindergarten. On numerous occasions, I heard different teachers and administrators describe this group of male students as “social misfits” and “nerds” whose only real talent lay in the area of mathematics. Rather than seek to change the behavior of the male students, practitioners admitted, they had been conceded this one area of the curriculum in which to shine.

Seeing difference in terms of specific preferences and learning styles possessed by particular gendered bodies failed to focus attention on the dominant values and assumptions guiding the practices of the AP calculus class—values that privileged speed, competition, abstraction, and individualism over all else. Moreover, by locating gender as a possession of individual men and women, difference-talk obscured the ways that dominant values were not simply different from, but were incompatible with, the kinds of values the young women articulated. Inequities (in opportunities to learn, gain confidence as mathematicians, etc.) were not simply unfortunate accidents caused by gender differences; those inequities were necessary outcomes of the gendered processes of that classroom.

Denial: The Discourse of Meritocracy

Difference-talk engendered a strong backlash from many of the young men in the class. With three exceptions, the young men in the class completely

denied the young women's charge that gender was intimately bound up with students' experiences of math curriculum and pedagogy. Rather, they employed a discourse that placed responsibility for mathematical success on each individual student's willingness to engage in hard work, to be responsible, and to work independently. Thus, most of the young men defended a notion of meritocracy upholding a strong conviction that success was achieved according to a just system of awards.

Within this discourse, some male students argued that the young women had employed gender as an excuse for either mathematical incompetence or insufficient effort. Describing himself as "enormously agitated" about the women's charges, Joe stated:

This could be kind of snotty or whatever, I don't care. But when I saw there was just an opportunity for people who could not learn at the pace in the advanced class to create an excuse to slow down and to basically blame that on somebody else. I personally think that well, these are the terms of the advanced class. You go in and you do it at the pace the teacher sets. If you can't handle it all, obviously there should be some help. And the help was given last year. But all these accusations I just find particularly groundless and there's no meaning whatsoever.

For Joe, the girls' attempt to describe their experiences in terms of gender dynamics was a diversionary tactic from the truth that they were not capable of "learn[ing] at the pace in the advanced class." By focusing on the girls' lack and accusing them of trying to "slow down" the class, Joe froze the "terms of the advanced class" as axiomatic. In Joe's universe, the teacher sets the law—speed being the essence of this law—and students must follow suit. Recognizing that this hard-line attitude might make it difficult for some students who "can't handle it," Joe supported a limited welfare model—"there should be some help." The existence of help alleviated any need to consider further the fundamental principles invisibly guiding the curriculum and pedagogy. Like many of his male peers, Joe positioned the practices of mathematics as a given, thus maintaining the belief that success was awarded to deserving students. Many male students defended the axiomatic "terms," embedded in the practices of this calculus class, which privileged speed, competition, and self-reliance over the collaborative, holistic approaches to teaching and learning advocated by the women (see also Boaler, 1997).

For many young men, there seemed to be ample evidence that their female peers had not earned the right to success. Some argued that it was not a matter of capability but rather that the women were not acting in responsible ways that would have guaranteed doing well in the course. Tim stated:

One thing that I think is extremely amusing. Last year there were a whole bunch of times in class when Hannah and Emma would like turn over to me and say, "All the boys are on that side of the class and all the girls are on this side." And they'd

make a big deal out of that. But then couldn't they make a big deal out of the fact that they weren't listening at all? They were just sitting there. Emma, every day would write a letter to one of her friends. No wonder she wasn't doing well in math. I mean did they hand in their homework? No, I don't think they did. This seems sort of awkward to me that people are having trouble and saying that this trouble is based on this [gender]. That we should look at male-female relationships like we're doing now. In math, maybe. Or in the whole school. But we also have to look at the fact that some people that are not doing well are not doing well because they're lazy. They're not doing the work.

In fact, according to both the young women and their teachers, all but one of the female students were successfully completing the course work and receiving good grades. However, in concert with Joe's interpretation, Tim claimed that gender was an excuse that female students employed to shirk responsibility for their actions. From Tim's vantage point, the women were inattentive during class and unproductive at home; the latter was a claim for which he had no definite knowledge only a suspicion—he "thinks" they did not do their homework. Tim characterized the women as "lazy" and as not doing necessary work. In doing so, Tim reiterated and staunchly defended the belief that hard work is inevitably rewarded.

In those very moments that male students claimed women were not acting in appropriate, conscientious ways, they were positioning themselves as self-reliant parties whose academic success or failure was directly correlated with their effort. Continuing from what is quoted above, Tim said:

I mean I didn't do well in math this year. Why did I not do well in math this year? Because I didn't do all of the homework when I should have done all the homework. Not because gender issues were screwing me up.

In pointing to his behavior as an explanation for his poor academic performance,¹² Tim saw himself as firmly in control of his educational outcome in the math class. Another student, Mark, contrasted his willingness to admit fault for failing to understand a concept with the approach of his female peers. The women, he argued, blamed their teachers for teaching poorly or for failing to spend time in class reviewing homework. Of himself, Mark stated, "I said, 'I didn't know how to do this because it was my fault that I didn't pay attention.'" Like Tim, Mark considered himself to be fully in control of his academic predicament. Thus, Mark and Tim turned their academic underperformance into a virtue by eagerly resting blame on themselves. By contrast, the female students were dismissed as complainers who cited gender issues as interfering with their math performance in order to evade responsibility. Tim, Mark, and many other of their male peers came to understand the dynamics and experiences of students in the advanced class within a meritocratic framework that proposed that individual students could guarantee academic success by acting responsibly: paying attention, doing homework, and seeking extra help all constituted such action.

The depths of what was being defended through this discourse of meritocracy was reflected in the tone and particular language that these male students used when talking about their class. It is important to note again that there were three young men in the advanced class who, along with their female peers, proposed the need for rethinking the way math was structured as a discipline and the pedagogical approaches employed. This will be taken up in the next section. However, it is equally remarkable that it was only young men and no women who took up the discourse of meritocracy and they did so with a vengeance. The tone of their talk was often vituperative. In the focus groups, young men raised their voices and their anger fed increasing fury. In one focus group interview, some male students who initially took a more sympathetic stance toward the women's analysis, completely turned around and dismissed gender as an excuse the minute one student, Joe, had heatedly argued that point. It was as if Joe had opened up the possibility for them to lash out. In addition to anger, male students used patronizing, dismissive language in reference to the women's claims that were discussed, for example, as "ridiculous" and "amusing."

The strong emotional currents running through many of the male students' talk moved alongside a stream of language that appropriated reasoned scientific discourse to support their case. For example, after rejecting the women's propositions about gender dynamics and referring to them as "lazy," Tim argued:

Now maybe gender issues are screwing them up. I'm not trying to disprove that. But maybe they're not doing well because they're not working. Because the evidence I'm seeing is they're not working. There are girls like Janie who are working who do get good grades. So, I don't see the correlation between the two.

In this passage, Tim opposed the women's interpretative framework by carefully laying claim to the logic of empiricism. Beginning by stating that he was not trying to "disprove" their theory, Tim then cited the "proof" that the women were misguided in pointing to gender. He appealed to "evidence" to show a lack of "correlation" between gender and academic outcome. With reasoned proof squarely on their side, many young men sought to discredit women's claims as emotional overreaction. Daniel argued, "Once they found this thing that could take the blame—that is that there were gender problems—they sort of gave up. They just got frustrated and gave up." Mark contrasted the response of a male peer who had missed a class to that of a female peer. Asking for help, Mark argued that his male peer responded "by saying, 'Okay, can you give me the example, take me through it and see if I can understand it.'" Whereas, "the girl called me, had a fit on the phone, was completely confused." Mark painted an image of his male peer as a person who took a logical, efficacious approach to solving two problems—the problem of having missed a class

and the mathematical problem. His female peer, on the other hand, was portrayed in terms that suggested hysteria (“a fit”) and fuzzy-minded thinking (“completely confused”).

In employing a discourse of meritocracy, many young men built a case against the women’s objections to the pedagogy and curriculum of the advanced class. They assumed that the women were performing poorly—an assumption that was not, according to both teachers and female students, the case. They then dismissed the women’s critiques as a reflection of diversionary tactics aimed at focusing blame on others rather than on their behavior. Many of the young men characterized the women’s behavior in terms of laziness, incompetence, and an unwillingness to pay attention, to do work, or to ask for help. Rather than examine the competitive environment of the class as a possible cause for female students’ increasing frustration and in some cases retreat from active participation during class time (see also Boaler, 1997), these men positioned women as actively and without reason deciding not to participate fully in the goals of the course. These young men’s accusations averted attention away from any systematic analysis of curriculum and pedagogy to blame individual women for their disenchantment or disengagement. By focusing on their perceptions of the women’s behavior, and ignoring the context of the class itself and their own behavior, these young men ended the year with their belief in meritocracy untouched, and their suspicions that female students were unwilling or unable to master advanced math confirmed. Given that City Academy’s mission was largely built on meritocratic beliefs and that practitioners did not push these students to confront those assumptions, it comes as no surprise that the young men’s faith in the system was unshaken by their female peers’ critiques.

Critiquing Some of the Foundations of Their Mathematics Education

Although often difficult to hear above the omnipresent difference-talk and the defensive meritocratic discourse, a fainter discursive current articulated by the young women and some of their male colleagues shifted the locus of the problem in their math class away from a focus on gender differences or individuals’ actions. At times, students called into question three critical premises of the curriculum and pedagogy: the individualism valued by the pedagogy, the nature of assessment, and the relationship between the learner and the curriculum. By relocating the problem in specific classroom pedagogies and practices, these students offered some important ideas for addressing educational equity in their mathematics classroom.

At the end of their junior year, the young women had asked the administration to allow them to pursue their senior calculus course in the context of a cooperative peer-run independent study—part of a well-established

tradition in their school. Although their plan was rejected, the idea for their course reflected a critique of dominant ways of teaching and learning math. Rather than continue in a class premised upon a more individualistic model of teaching and learning, these young women, along with some of their male peers, argued that the type of mathematical thinking required by advanced calculus was more conducive to group problem solving. For example, Gary stated that in the last two years the curriculum had taken a conceptual shift, one that demanded that students understand mathematics at a more theoretical, problem-solving level. Gary argued:

These are the kinds of problems I should be working on in small groups—problems that are new and unfamiliar. You know sometimes it's great to work on it by myself and I feel good when I figure something out like that . . . But when I was actually using it at such an advanced level that I was sort of conjuring things up that might have been helpful if I could have asked Rob what he thought about it. And maybe he saw something that I didn't see and I'd see something he didn't see.

Gary suggested that collaborative learning held possibilities for coming to a deeper understanding of mathematics through sharing a variety of perspectives in order to solve problems. This is not a radical proposal for many educational contexts, especially in the context of mathematics reform efforts (Boaler, 1997; National Council of Teachers of Mathematics, 1989). However, it represented a serious departure from the norm in the students' math class. The course's agenda—to plough through a broad field of calculus at a rapid pace in preparation for the Advanced Placement exams—in combination with an environment supporting some students' individualistic, competitive styles had made questioning, deep exploration, and collaboration next to impossible.

Janie, making an argument similar to Gary's, went even further to call into question the premise of individual evaluation. Speaking of times when her needs were met in the math course, Janie recalled:

I remember one class we had a test that I think people answered one out of four problems. That was sort of the average was that no one got any of it. We decided to just do it in class. Marilyn [the teacher] didn't give us back the test; we just did the problems. And I remember coming away from that thinking, "God, why can't I take every test as a collaborative effort because it just—when I came away I just really understood the problems because I had contributed what I knew and this person next to me contributed what they knew and we had our combined learning. And I think learning in small groups is always helpful for me.

As each person contributed her perspective, each individual was valued and knowledge became a possession of the entire group. Thus, underneath Janie's plea to take all her tests as a collaborative effort lies a radical, though unarticulated, idea to destroy the keystone of educational architecture built on individual achievement. Janie's idea suggests a different

education goal—that every student, as part of a community, develop an understanding of the material. This goal is fundamentally at odds with goals of the norm-referenced Advanced Placement examinations that, by definition, rank students individually and hierarchically.

In addition to proposing that collaboration rather than competition might serve as the basis for a successful math class, some students offered a significant reconceptualization of the relationship between curriculum and learner. Students suggested that in order to develop a math curriculum and pedagogy that could meet the needs of a diverse group of students, teachers must develop relationships with them that reflected deep knowledge of who they were as learners. Hannah spoke of feeling invisible and unknown by her math teachers:

I have never really felt that my math teachers had a sense of who I am as a student at all, and could describe me the way, say, an English teacher could. I understand there's a difference 'cause I'm continually writing for an English teacher or a history teacher. But there shouldn't be that huge of a chasm between the way a math teacher knows me and the way every other one of my teachers knows me.

Underneath this desire to be known is a certain view of curriculum that suggests there is an important connection between who one is as a learner and the material to be learned. This differs significantly from a more traditional perspective that conceptualizes mathematics as a body of knowledge existing “out there” that can be acquired by students without attention to any variety in preferred approaches to learning or particular interests (see, e.g., Chapman, 1993).

Thus, in listening below the surface of difference-talk we can hear another framework for imagining more equitable classrooms—one through which some of the students challenged the pedagogy and practices of math classes to become more inclusive of a range of learners. Further, this framework argued for classes that would support and reward collaboration, questioning, and curiosity, rather than competition and right answers. In focusing on types of interactions between student and teacher, student and student, and student and curriculum this discursive undercurrent began to unveil the dominant values and assumptions that had drawn the boundaries of practice, thereby opening those practices to the possibility of renegotiation.

DISCUSSION

Be careful how you interpret the world. It is that way.

Eric Keller

From one perspective, the story I have told here reflects a group of young women's astute efforts to confront inequality in their mathematics

education and a failure on the part of City Academy's practitioners to engage with reforms that would address their concerns. Until their third year in secondary school, these six young women had been among the few beneficiaries of the only tracking system at City Academy. However, within the context of their precalculus and calculus courses, these young women pierced through the invisible veil of this privileged position to call into question classroom practices that they had come to see as unjust. It was to feminist work that they turned to formulate their critique.

It is not incidental that the context for this outcry was the advanced math. In many school contexts, gender equity remains elusive, especially at the most advanced levels of mathematics education (AAUW, 1998; Boaler, 1997). At City Academy, the advanced track was born out of the ashes of the school's attempts to radically reform its mathematics curriculum. To a large degree, the unwillingness on the part of the administration to engage the young women's critiques in ways that led to real reform reflected the politicized nature of the AP calculus course. As one administrator explicitly told me, the AP calculus course was "highly political" and implementing radical change risked provoking the ire of some powerful parents.

Although the political nature of this class made it a difficult object for reform, I do not want to represent practitioners as simply unwilling to implement changes. In part, the responses they did make reflect certain assumptions about gender equity. Part of their analysis rested on the belief that the young women needed a role model: thus the decision to have a relatively new female teacher take over the course. In addition, further reforms were stymied by feelings on the part of administrators and Marilyn Davis that, to a large extent, their hands were tied by the expectations of the AP curriculum. Marilyn Davis and Mike Knight (the school's director of curriculum) began the year with great hopes that they might engage students in an exploration of their different learning styles and approaches to mathematical thinking. However, they dropped this goal after one meeting, reportedly because the AP curriculum demands were simply too large to adequately cover material and attend to an investigation of how students learn. By abandoning this idea to engage students in a critical analysis of mathematics learning, gender, and equity, the female students were left without a partner for change. Further, most of the young men continued to cling to a conviction of the meritocratic nature of the system of privilege from which they were profiting.

From one angle, then, this may be a tale about the failure of one school to address gender equity in the mathematics classroom. However, I want to draw attention here to the critical importance of interpretation for generating possibilities for action. In particular, I want to examine how the young women's interpretive frameworks were interwoven with broader societal discourses around gender equity in education.

It should come as no surprise that the young women at City Academy articulated a difference discourse to argue for gender equity in their math class. We are living in a moment in which educational, as well as public, discourse about gender is saturated with talk about differences between men and women, boys and girls. For example, a spate of popular books champions the cause of males straight-jacketed by culture and feminists, and behaviorally driven by testosterone (see, e.g., Gurian, 1996; Sommers, 2000). From a different angle, academic research in mathematics education debates, for example, the origins and meanings of gender differences in problem solving (see, e.g., Fennema et al., 1998; Hyde & Jaffee, 1998; Noddings, 1998; Sowder, 1998). Within this broader cultural context, it was almost inevitable that the young women at City Academy drew first upon the language of gender differences to understand their experiences with their math education. This discourse of gender differences gave the women one powerful interpretive standpoint from which to demand change. It offered the women a collective language for critiquing their math education and provided them with a new way of thinking about gender equity.

Through language born of feminism, identity politics, and multiculturalism, the female students spoke back powerfully to the discourse of meritocracy that was woven seamlessly throughout the architecture of City Academy, and was explicitly articulated by some of their male peers. These young women argued that access to classrooms based on norms, values, and practices that are antithetical to women's "culture" could not offer fair and responsive educational experiences (see, e.g., Belenky et al., 1986/1997; Noddings, 1998). Thinking about gender differences allowed the women to claim collectively the right to a different kind of education. If women have different learning styles and values, then equity demanded their math classroom be responsive to those differences. Thus, in drawing upon the discourse of gender difference, these women were able to analyze their experiences, calling into question some of the practices undergirding their math education. Naming certain practices (such as competition, individualism, and decontextualized approaches to knowledge) as antithetical to women's ways of knowing (Belenky et al., 1986/1997), the female students at City Academy rejected the dominant modes of interaction in their math classroom. They highlighted cooperative learning, peer mentoring, and connected knowledge (see also Boaler, 1997) as some of the responsive practices through which the school might provide them with fair and equitable treatment in the mathematics classroom. In requesting a peer-led, cooperative independent study, the women were, in a sense, saying, "Leave the boys their territory and give us a course of our own." Certainly, creating all-female math and science courses has been one tried remedy for supporting gender equity (see AAUW, 1998; Phillips, 1998).

However, this difference framework brings with it assumptions that may make it a difficult position from which to launch reform, especially in a

co-educational setting. For example, the administration had complex reasons for rejecting the young women's proposal for a peer-led independent course; however, one aspect of that refusal related to co-education itself. Does a co-educational school want to open up its doors to segregated classrooms? Further, would treating women and men differently resolve gender equity? Not all the men in the calculus class were, in fact, beneficiaries of gender privilege. Recall that only 5 out of the 15 men actually ended up sitting for the AP examination. Several men had also expressed their frustration with the classroom pedagogy. Would many of the young men not also have benefited from the kind of teaching and learning proposed by the young women? There is some good evidence that many male students also benefit from more progressive approaches to mathematics (Boaler, 1997). Approaches to gender equity that are framed in terms of gender differences obscure shared qualities between males and females. Further, they can lead to the accusation that giving to women means taking away from men (see Kenway & Willis, 1998). If the young women had their way, would this not disadvantage the young men? This was certainly one refrain I heard from some teachers at City Academy.

There is another significant limitation to approaching gender equity from a gender difference framework. Within this framework, gender is located outside of specific contexts. The argument is that female and male students import these different "ways of knowing" (Belenky et al., 1986/1997) into the classroom contexts. However, the experiences of these young women also give flesh to theoretical arguments that caution against seeing difference as qualities of groups, rather than as produced within specific contexts. Focusing on gender differences in learning styles did not open up for investigation the particular interactions within the students' advanced mathematics classroom through which power and privilege were continually produced and reinforced in gender-inflected ways (Thorne, 1993; West & Zimmerman, 1987). However, it was precisely such an analysis that some students were indicating in the third discourse described above. What if the goal of the calculus course had been that all students would collectively come to an understanding of the material, rather than that the curriculum would be covered so that students could take a norm-referenced test—one that would, by design, put some students ahead of others? What would have happened if Janie's suggestion that students take all their tests communally had come to fruition? These are questions that demand an examination not simply of individual classrooms, or of mathematics education, but of the most fundamental values structuring our schooling system (cf. Varenne & McDermott, 1998).¹³ Rather than continue asking how girls are different from boys,¹⁴ if we are to confront inequities, we must ask how the dominant values and assumptions of our educational system produce and perpetuate the success of some at the expense of others.

Thus, the experience at City Academy provides a grounded critique of the dominant paradigms through which students came to understand gender equity. Examining how the debate about the meanings of gender equity and mathematics education played out in one particular school helps reframe the kinds of questions and conversations that practitioners and researchers could engage with (not simply on behalf of) students as they seek to address educational inequities, within and beyond the mathematics classroom. This reframing demands that we interrupt the dominant contemporary conversations that posit debates about gender equity in terms of men versus women. Rather, we must look at the ways that power and privilege are negotiated in the interaction between men and women. I suggest that an important piece of our work in schools must be to involve students with us in such critical analyses. I leave my colleagues in mathematics education to imagine how this work could play out in particular mathematics contexts.

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NOTES

1. All names and identifying characteristics of individuals and the school have been changed.
2. I purposefully use discourse to refer to the ways that local talk about gender reflected larger societal discourses about difference, represented, for example, in politics and legal theory. I employ the term discourse following the use of many social theorists, most importantly Foucault, to refer to social practices of talk and action that constitute objects—that bring into being what we can know and not know (see Ericsson, 1996; Fairclough, 1995; Foucault, 1972; Scott 1998; Weedon, 1987). Discourse refers to sets of undergirding values, beliefs, relationships, and assumptions that are manifest across institutions and individuals.
3. City Academy served a predominantly white student population (80 percent). The school was committed, however, to becoming a more racially and ethnically diverse community. The school was investigating how to recruit more students and faculty of color, while also building a culture that would be more reflective of, and responsive to, the diverse communities it served.
4. Given the constraints of this article, I am bracketing a discussion of race. However, critical to this analysis is the fact that there were no students of color

in this class and that in general the school's advanced math track enrolled very few students of color. For a detailed discussion of the issues of race, class, and (dis)ability in this setting, see Abu El-Haj (1998).

5. This decision was based on assumptions about shared experiences as women. It is an assumption that made invisible how race was also at play in that classroom.
6. During their junior year, the advanced section had six young women enrolled out of a total of 21 students. At the beginning of their senior year, another female student joined the class. A few months into the school year one girl left the course.
7. The BC examination tests a more advanced calculus curriculum.
8. In an interview, this young woman told me she was asked to leave the advanced course. Administrators told me she had chosen to drop the course.
9. Four of the young men in the BC section and three of the male students in the AB section were primarily responsible for setting this contentious tone.
10. Across the school, African-American female faculty often felt their authority similarly challenged by white students. In many classrooms, I observed a marked difference between the ways that some white students treated their African-American female teachers, displaying challenges to their authority that I did not see when I observed those same students in the classes of white teachers or male African-American teachers. Speaking of one of her challenging students, another African-American female teacher explained, "I wonder how many black teachers has [this student] had? Does she equate me with her housekeeper?"
11. It is important to remember that not all the male students benefited from this competitive environment.
12. Tim's statement admittedly echoes the work of Carol Dweck and her colleagues that suggest boys tend to attribute academic success to ability and failure to lack of hard work, whereas girls tend to make the reverse attributions (Dweck et al., 1978).
13. They also demand examining how schools like City Academy are constrained in the changes they can make by the larger educational economy of capital within which they operate (see Abu El-Haj, 1998).
14. Gender difference discourse parallels other discourse about difference (especially in terms of race, disability, and sexuality) that is equally problematic. At City Academy the fact that students of color rarely participated in the advanced track was, while an area of concern, attributed primarily to cultural differences.

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