

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 rescindation¹, we have in fact changed little during the past two decades (William, 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 (William, 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

Brian R. Lawler welcomes discussion at blaw@charter.net.

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 family⁸, 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 Hart¹² 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

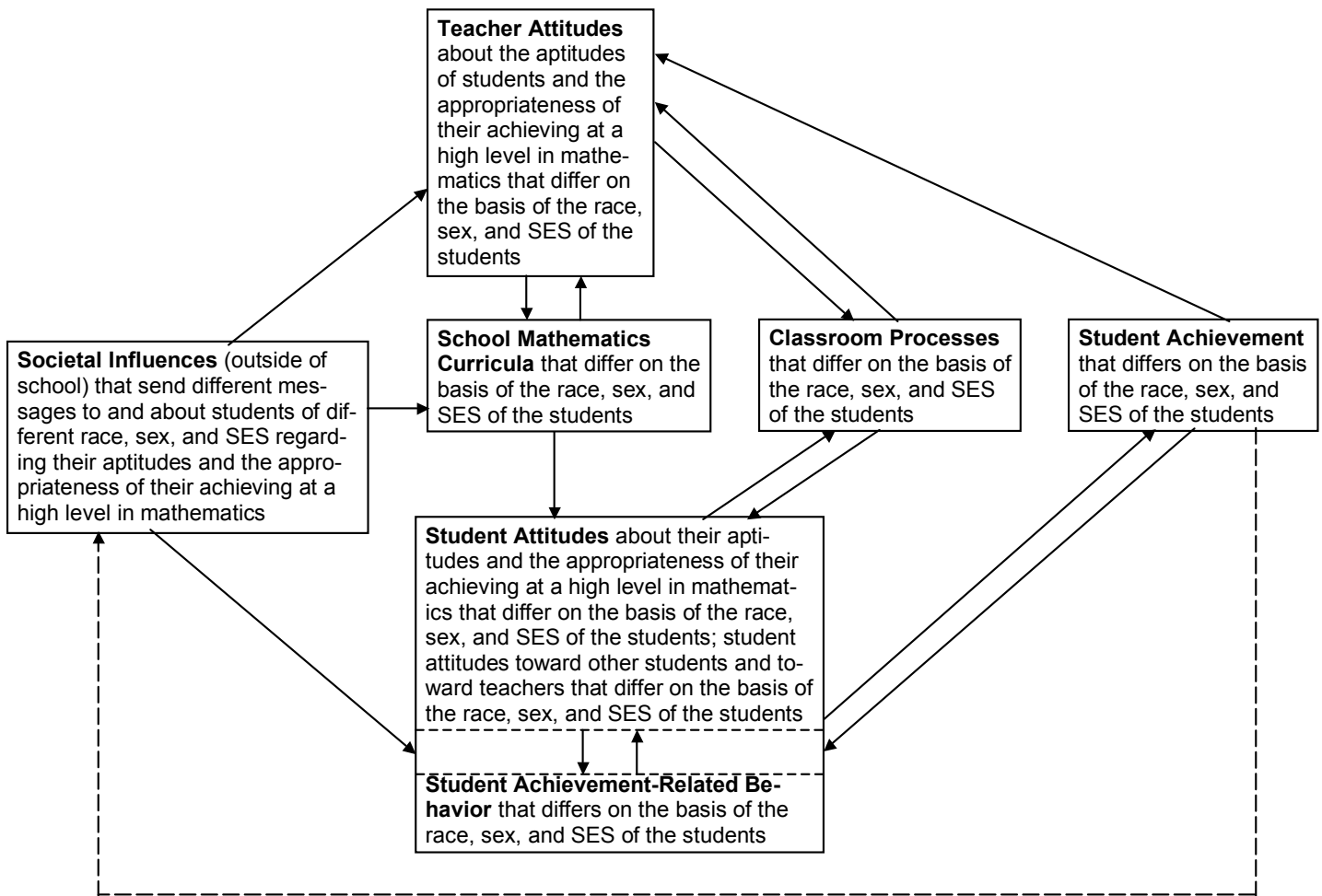


Figure 1. Replication of Reyes and Stanic's (1988) Model to Explain Differences in Mathematics Achievement Based on the Race, Sex, and Socioeconomic Status (SES) of Students

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 commonsensically 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 on²² 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 play²⁵ 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

indeterminacy 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 (William, 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 inequities. 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. Bové'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 (William, 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 indeterminacy 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" (William, 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 indeterminacy 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).

References

- Apple, M. W., & Beane, J. A. (1995). *Democratic schools*. Alexandria, Va.: Association for Supervision and Curriculum Development.
- Bateson, G. (1972). *Steps to an ecology of mind*. New York: Ballantine Books.
- Baudrillard, J. (1988). Simulacra and simulations. In M. Poster (Ed.), *Jean Baudrillard: Selected writings* (pp. 166–184). Stanford, CA: Stanford University.
- Benezet, L. P. (1935a). The teaching of arithmetic I: The story of an experiment. *Journal of the National Education Association*, 24(8), 241–244.
- Benezet, L. P. (1935b). The teaching of arithmetic II: The story of an experiment. *Journal of the National Education Association*, 24(9), 301–303.
- Benezet, L. P. (1936). The teaching of arithmetic III: The story of an experiment. *Journal of the National Education Association*, 25(1), 7–8.
- Black, P., & Wiliam, D. (1998). Inside the black box: Raising standards through classroom assessment. *Phi Delta Kappan*, 80(2), 139–148. (Available online at <http://www.pdkintl.org/kappan/kbla9810.htm>)
- Boaler, J. (2002). Paying the price for ‘sugar and spice’ – shifting the analytical lens in equity research. *Mathematical thinking & learning*, 4(2 & 3), 127–144.
- Boaler, J., & Humphreys, C. (2005). *Connecting mathematical ideas: Middle school video cases to support teaching and learning*. Portsmouth, NH: Heineman.
- Boaler, J., & Staples, M. (in press). *Transforming students’ lives through an equitable mathematics approach: The case of Railside school*.
- Bové, P. A. (1990). Discourse. In F. Lentricchia & T. McLaughlin (Eds.), *Critical terms for literary study* (pp. 50–65). Chicago: University of Chicago.
- Crandall, D. P., Bauchner, J. E., Loucks, S. F., & Schmidt, W. H. (1982). *Models of the school improvement process: Factors contributing to success. A Study of dissemination efforts supporting school improvement*. Andover, Massachusetts: The Network.
- D’Ambrosio, U. (1990). The role of mathematics education in building a democratic and just society. *For the Learning of Mathematics*, 10(3), 20–23.
- Davis, B. (1995). Why teach mathematics? Mathematics education and enactivist theory. *For the Learning of Mathematics*, 15(2), 2–9.
- Davis, B. (1996). *Teaching mathematics: Toward a sound alternative*. New York: Garland Publishing.
- Davis, B. (1997). Listening for differences: An evolving conception of mathematics teaching. *Journal for Research in Mathematics Education*, 28(3), 355–376.
- Davis, B. (2001). Why teach mathematics to all students? *For the Learning of Mathematics*, 21(1), 17–24.
- Deleuze, G., & Guattari, F. (1987). *A thousand plateaus: Capitalism and schizophrenia*. Minneapolis: University of Minnesota.
- Derrida, J. (1978). Structure, sign and play in the discourse of the human sciences (A. Bass, Trans.). In *Writing and difference* (pp. 278–293). Chicago: University of Chicago.
- Dewey, J. (1937). Education and social change. *Social Frontier*, 3, 235–238.
- Dewey, J. (1964). The child and the curriculum. In R. D. Archambault (Ed.), *John Dewey on education* (pp. 339–358). Chicago: University of Chicago. (Original work published 1902)
- Ernest, P. (2000). Why teach mathematics? In J. White & S. Bramall (Eds.), *Why learn maths?* London: London University Institute of Education.
- Foucault, M. (1997). The ethics of the concern of the self as a practice of freedom. In P. Rabinow (Ed.), *Ethics: Subjectivity and truth* (pp. 281–201). New York: The New Press. (Interview conducted 1984)
- Freire, P. (2002). *Pedagogy of the oppressed* (M. B. Ramos, Trans.). New York: Continuum. (Original work published 1970)
- Freire, P., & Macedo, D. (1987). *Literacy: Reading the word and the world*. New York: Bergin & Garvey.
- Gates, P., & Vistro-Yu, C. P. (2003). Is mathematics for all? In A. J. Bishop, M. A. Clements, C. Keitel, J. Kilpatrick & F. K. S. Leung (Eds.), *Second international handbook of mathematics education* (Vol. 1, pp. 31–73). Dordrecht: Kluwer Academic Publishers.
- Greer, B., & Mukhopadhyay, S. (2003). What is mathematics education for? *The Mathematics Educator*, 13(2), 2–6.
- Gutstein, E. (2003). Teaching and learning mathematics for social justice in an urban, latino school. *Journal for Research in Mathematics Education*, 34(1), 37–73.
- Harel, I., & Papert, S. (Eds.). (1991). *Constructionism: Research reports and essays, 1985–1990*. Norwood, N.J.: Ablex Pub. Corp.
- Hart, L. E. (2003). Some directions for research on equity and justice in mathematics education. In L. Burton (Ed.), *Which way social justice in mathematics education?* (pp. 27–49). Westport, Conn.: Praeger.
- Hill, H. C., Rowan, B., Ball, D. L. (2005). Effects of teacher’s mathematical knowledge for teaching on student achievement. *American Educational Research Journal*, 42(2), 371–406.
- Kandell, J. (2004, October 10). Jacques Derrida, abstruse theorist, dies in Paris at 74. *The New York Times*, p. 1.

- Kieren, T., Gordon-Calvert L., Reid, D. & Simmt, E. (1995). *An enactivist research approach to mathematical activity: Understanding, reasoning, and beliefs*. Paper presented at the meeting of the American Educational Research Association, San Francisco.
- Kilpatrick, J. (1992). A history of research in mathematics education. In D. A. Grouws (Ed.), *Handbook of research on mathematics teaching and learning* (pp. 3–38). New York: MacMillan.
- Kilpatrick, J. (1997). Five lessons from the new math era. *Reflecting on Sputnik: Linking the Past, Present, and Future of Educational Reform* Retrieved June 5, 2005, from <http://www.nas.edu/sputnik/kilpatin.htm>
- Kincheloe, J. L., & McLaren, P. (2000). Rethinking critical theory and qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research: Second edition* (pp. 279–313). Thousand Oaks, CA: Sage.
- Kliebard, H. M. (1995). *The struggle for the American curriculum, 1893–1958* (2nd ed.). New York: Routledge.
- Kohl, H. R. (1994). *“I won’t learn from you”: And other thoughts on creative maladjustment*. New York, NY: New Press: Distributed by W.W. Norton.
- Kohn, A. (1999). *Punished by rewards: The trouble with gold stars, incentive plans, A’s, praise, and other bribes*. Boston: Houghton Mifflin Co.
- Kvale, S. (1996). *Interviews: An introduction to qualitative research interviewing*. Thousand Oaks, CA: Sage.
- Lather, P. A. (1991). *Getting smart: Feminist research and pedagogy within the postmodern*. New York: Routledge.
- Lather, P. A., & Smithies, C. (1997). *Troubling the angels: Women living with HIV/AIDS*. Boulder, Colo.: Westview.
- Lee, C. D. (2003). Why we need to re-think race and ethnicity in educational research. *Educational Researcher*, 32(5), 3–5.
- Lee, C. D., Spencer, M. B., & Harpalani, V. (2003). “Every shut eye ain’t sleep”: Studying how people live culturally. *Educational Researcher*, 32(5), 6–13.
- Lee, J. (2002). Racial and ethnic achievement gap trends: Reversing the progress toward equity? *Educational Researcher*, 31(1), 3–12.
- Liotard, Jean-François. (1993). *The Postmodern Condition: A Report on Knowledge*. (Translation from the French by Geoff Bennington and Brian Massumi) Minneapolis: University of Minnesota. (Original work published 1979)
- Marcus, G. (1994). What comes (just) after post? The case of ethnography. In N. Denzin & Y. Lincoln (Eds.) *Handbook of Qualitative Research* (pp. 563–574). London: Sage.
- Martin, D. B. (2000). *Mathematics success and failure among African American youth: The roles of sociohistorical context, community forces, school influence, and individual agency*. Mahwah, NJ: Lawrence Erlbaum.
- Martin, D. B. (2003). Hidden assumptions and unaddressed questions in *mathematics for all* rhetoric. *The Mathematics Educator*, 13(2), 7–21.
- McLaren, P. (1994). *Life in schools: An introduction to critical pedagogy in the foundations of education* (2nd ed.). New York: Longman.
- Mellin-Olsen, S. (1987). *The politics of mathematics education*. Dordrecht: Kluwer Academic Publishers.
- Moses, R. P., & Cobb, C. E. (2001). Algebra and civil rights. In *Radical equations: Math literacy and civil rights* (pp. 3–22). Boston: Beacon.
- National Commission on Mathematics and Science Teaching for the 21st Century (U.S.). (2000). *Before it’s too late: A report to the nation from the national commission on mathematics and science teaching for the 21st century*. Washington, D.C.: U.S. Dept. of Education.
- National Council of Teachers of Mathematics. (1989). *Curriculum and evaluation standards for school mathematics*. Reston, VA: Author.
- National Council of Teachers of Mathematics (2000). *Principles and standards for school mathematics*. Reston, VA: Author.
- Noddings, N. (1993). Politicizing the mathematics classroom. In S. Restivo, J. P. V. Van Bendegem & R. Fischer (Eds.), *Math worlds: Philosophical and social studies of mathematics and mathematics education* (pp. 150–161). Albany, NY: SUNY.
- Oakes, J. (1985). *Keeping track: How schools structure inequality*. New Haven: Yale University.
- Popkewitz, T. (2004). The alchemy of the mathematics curriculum: Inscriptions and the fabrication of the child. *American Educational Research Journal*, 41(1), 3–34.
- Reed, C. J., & Kochan, F. K. (2003). Educational improvement, economic development, and sustainability in rural professional development schools. *Annual Meeting of the American Educational Research Association*. Chicago, IL.
- Reyes, L. H., & Stanic, G. M. A. (1988). Race, sex, socioeconomic status, and mathematics. *Journal for Research in Mathematics Education*, 19(1), 26–43.
- Scheurich, J. J. (1995). A postmodernist critique of research interviewing. *International Journal of Qualitative Studies in Education*, 8(3), 239–252.
- Scott, J., & Leonhardt, D. (2005, May 15, 2005). Class in America: Shadowy lines that still divide. *The New York Times*.
- Secada, W. G. (1989). Agenda setting, enlightened self-interest, and equity in mathematics education. *Peabody Journal of Education*, 66(2), 22–56.
- Secada, W. G. (1992). Race, ethnicity, social class, language, and achievement in mathematics. In D. A. Grouws (Ed.), *Handbook of research on mathematics teaching and learning* (pp. 623–660). New York: Macmillan Publishing Company.
- Skovsmose, O. (1994). *Towards a philosophy of critical mathematics education*. Dordrecht, The Netherlands; Boston: Kluwer Academic Publishers.
- Spivak, G. C. (1974). Translator’s preface (G. C. Spivak, Trans.). In J. Derrida (Ed.), *Of grammatology* (pp. ix–xc). Baltimore: Johns Hopkins University.
- Spring, J. H. (1993). *Wheels in the head: Educational philosophies of authority, freedom, and culture from Socrates to Paulo Freire*. New York: McGraw-Hill.
- St. Pierre, E. A. (1997). Methodology in the fold and the irruption of transgressive data. *International Journal of Qualitative Studies in Education*, 10(2), 175–189.
- St. Pierre, E. A. (2000a). The call for intelligibility in postmodern educational research. *Educational Researcher*, 29, 25–28.
- St. Pierre, E. A. (2000b). Poststructural feminism in education: An overview. *International Journal of Qualitative Studies in Education*, 13(5), 467–515.

- Stanic, G. M. A. (1984). Why teach mathematics? A historical study of the justification question (doctoral dissertation, University of Wisconsin—Madison, 1983). *Dissertation Abstracts International*, 44, 2347A.
- Stanic, G. M. A. (1986). The growing crisis in mathematics education in the early twentieth century. *Journal for Research in Mathematics Education*, 17(3), 190–205.
- Stanic, G. M. A. (1989). Social inequality, cultural discontinuity, and equity in school mathematics. *Peabody Journal of Education*, 66(2), 57–71.
- Stanic, G. M. A., & Kilpatrick, J. (1992). Mathematics curriculum reform in the United States: A historical perspective. *The International Journal for Educational Research*, 17(5), 407–417.
- Stinson, D. W. (2004). *African American male students and achievement in school mathematics: A critical postmodern analysis of agency*. Unpublished doctoral dissertation, University of Georgia, Athens.
- Turkle, S., & Papert, S. (1992). Epistemological pluralism and the reevaluation of the concrete. *Journal of Mathematical Behavior*, 11(1), 3–33.
- von Glasersfeld, E. (1990). An exposition in constructivism: Why some like it radical. In R. B. Davis, C. A. Maher & N. Noddings (Eds.), *Journal for research in mathematics education: Monograph number 4* (pp. 19–30). Reston, VA: National Council of Teachers of Mathematics.
- von Glasersfeld, E. (1995). *Radical constructivism: A way of knowing and learning*. London: Falmer.
- Walshaw, M. (2001). A Foucauldian gaze on gender research: What do you do when confronted with the tunnel at the end of the light? *Journal for Research in Mathematics Education*, 32(5), 471–492.
- Weissglass, J. (1991). Reaching students who reject school: A need for strategy. *Journal of Mathematical Behavior*, 10(3), 279–297.
- Weissglass, J. (1998). *Ripples of hope: Building relationships for educational change*. Santa Barbara, CA: The Center for Educational Change in Mathematics and Science.
- White, D. Y. (2002). Preparing preservice teachers to work in diverse mathematics classrooms: A challenge for all. *The Mathematics Educator*, 12(1), 2–4.
- Wiliam, D. (2002). The impact of educational research on mathematics education. In A. J. Bishop, M. A. Clements, C. Keitel, J. Kilpatrick & F. K. S. Leung (Eds.), *Second international handbook of mathematics education* (Vol. 2, pp. 471–490). Dordrecht: Kluwer Academic Publishers.
- Wiliam, D. (2003). Constructing difference: Assessment in mathematics education. In L. Burton (Ed.), *Which way social justice in mathematics education?* (pp. 189–207). Westport, CT: Praeger.
- Willis, P. E. (1977). *Learning to labour: How working class kids get working class jobs*. Farnborough, England: Saxon.
- Wilson, S. M. (2003). *California dreaming: Reforming mathematics education*. New Haven: Yale University.

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 jeopardy.’

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 *educere*, 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).