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TRANSITIONING INTO CONTEMPORARY THEORY: CRITICAL POSTMODERN THEORY IN MATHEMATICS EDUCATION RESEARCH

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In this theoretical paper, the authors provide an overview of mathematics education as a research domain, identifying and briefly discussing four transitions or historical moments in mathematics education research. Using the Instructional Triangle as a point of reference for the dynamics of mathematics instruction, they illustrate how mathematics education researchers working in different moments explore different questions and use different theoretical perspectives. The authors then provide brief summaries of critical theory and postmodern theory, and suggest critical postmodern theory (CPT) as a hybrid theory that offers new possibilities for conceptualizing and conducting mathematics education research.

Keywords: Research Methods

Introduction

In this theoretical paper, to critically examine and deconstruct the persistent inequities of mathematics education or, more specifically, to open up the "fictions, fantasies and plays of power inherent in mathematics education" (Walkerdine, 2004, p. viii), we make a case for considering critical postmodern theory (CPT) (Kincheloe & McLaren, 1994; Stinson & Bullock, 2012a) in mathematics education research. We believe that CPT provides a means to make visible the Trojan Horse of the *mathematics for all* rhetoric (Martin, 2003). We structure the paper into two sections. In the first section, we provide an overview of mathematics education as a research domain, identifying and briefly discussing four transitions or moments in mathematics education research. We use the familiar *Instructional Triangle* (see National Research Council, 2001, p. 314) as a point of reference for the dynamics of mathematics teaching and learning to illustrate how mathematics education researchers working in different moments explore different questions and use different theoretical perspectives. In the second section, we provide brief summaries of critical theory and postmodern theory, and suggest CPT as a hybrid theory that offers new possibilities for conceptualizing and conducting mathematics education research. (For a significantly revised and expanded version of this argument see Stinson & Bullock, 2012a, 2012b.)

Theoretical Transitions in Mathematics Education Research

Our intent here is not to offer a comprehensive history of mathematics education as a research domain, that has been done elsewhere (Kilpatrick, 1992). But rather to briefly outline four transitions or historical moments of mathematics education research: the process–product moment (1970s–), the interpretivist–constructivist moment (1980s–), the social-turn moment (mid 1980s–), and the sociopolitical-turn moment (2000s–). We do not see these moments as linear phases of progress but rather as distinct yet overlapping and simultaneously operating theoretical perspectives or paradigms. Therefore, we do not identify end dates. Furthermore, we understand that our attempt to mark the beginning of a moment within a specific decade is somewhat misleading, given that there have been education scholars and researchers (mavericks) who began developing different possibilities for mathematics education research long before the decades that we identify (e.g., Marilyn Frankenstein [1983/1987] began exploring the sociopolitical implications of critical mathematics education several years before the sociopolitical-turn moment of the 2000s).

Because mathematics education draws from a number of disciplines, it is surprisingly difficult to characterize, and research in mathematics education is perhaps even more difficult to define (Silver & Kilpatrick, 1994). Nonetheless, as we acknowledge the difficulty in "defining" mathematics education research, we start our discussion with the 1970s and identify this decade as the beginning of the process–product moment. Most of the research in this moment attempts to quantify effective mathematics teaching;

quantitative statistical inference is the primary methodology. Here, mathematics teachers' classroom practices are described (process) and linked to student outcomes (product); limited effort is made to describe the decision-making processes of teachers or students (e.g., Good & Grouws, 1979). Securely embedded in the Enlightenment (i.e., the Age of Reason), this moment is theoretical grounded in positivism. Its aim is to predict social phenomena by "objectively" observing and measuring a "reasonable" universe. In the late 1970s and early 1980s, however, mathematics education researchers began transitioning away from a reliance on statistical inference. An analysis of manuscripts submitted to and published by the *Journal for Research in Mathematics Education* between the early 1970s to the mid 1990s showed that by the end of the 1990s "mathematics education had outgrown its dependence on statistical techniques in favor of qualitative methodologies adapted from such disparate research disciplines as anthropology, psychology, history, philosophy, and sociology" (Lester & Lambdin, 2003, p. 1676).

And because research methodologies are inextricably linked to theoretical perspectives (LeCompte, Preissle, & Tesch, 1993), this favoring of qualitative methodologies transitioned some mathematics education researchers into new theoretical perspectives such as interpretivism and constructivism. Although embedded in the Enlightenment, within the interpretivist–constructivist moment (1980s–), the aim of research is not to predict social phenomena, but rather to understand it (e.g., Steffe & Tzur, 1994; Thompson, 1984). Here, mathematics teaching and learning is examined within the dynamic interactions between teachers-and-students and students-and-students as they engage with mathematics in the classroom; often illustrated in the familiar *Instructional Triangle* (see National Research Council, 2001, p. 314).

But as mathematics education researchers continue to explore the complexities of mathematics teaching and learning, adapting theoretical perspectives and methodologies from other disciplines, some begin to understand the indispensable requirement of exploring not only the complexities of the Instructional Triangle but also the complexities of contextualizing students, teachers, and mathematics (Stinson, 2006). In so doing, they make the *social turn* in mathematics education research (Lerman, 2000). The social turn signals something different in mathematics education research, namely, the emergence of theoretical perspectives that "see meaning, thinking, and reasoning as products of social activity" (Lerman, 2000, p. 23) (e.g., Boaler, 1998; Carraher, Carraher, & Schliemann, 1987; Cobb, Perlwitz, & Underwood, 1996). Lerman cautioned, however, that the greatest challenge for mathematics education researchers who work within the social turn "is to develop accounts that bring together agency, individual trajectories…and the cultural, historical, and social origins of the ways people think, behave, reason, and understand the world" (p. 36). Researchers in this moment in general do not abandon psychology altogether—a discipline that has had a seminal influence (Kilpatrick, 1992)—but rather call for a sociocultural, discursive psychology in which mathematics teaching and learning might be understood as a particular moment in the zoom of a lens (Lerman, 2001).

By zooming out, researchers explore not only the complexities of the concentric contexts in which the Instructional Triangle is embedded (e.g., classroom, school, district, community, society) but also the multiplicities of the sociocultural and sociohistorical discourses that construct and continuously shape those contexts (Weissglass, 2002). By zooming in, researchers explore the dynamic complexities of how sociocultural and sociohistorical discourses have constructed and continuously shape students, teachers, and mathematics—thus, the possibility of the very existence of the triangle. This back-and-forth zooming of the lens motivates different questions to explore regarding the contextualization of the triangle as well as students, teachers, and mathematics. This back-and-forth zooming has also resulted in a small (but growing) number of mathematics education researchers abandoning theoretical perspectives that investigate understanding social phenomena such as interpretivism or constructivism to embracing theoretical perspectives that investigate emancipation from or deconstruction of social phenomena such as critical theory, critical race theory, feminist theory, and postmodern theory. In so doing, these researchers have adopted "a degree of social consciousness and responsibility in seeing the wider social and political picture" of mathematics education research (Gates & Vistro-Yu, 2003, p. 63).

Seeing the wider social and political picture characterizes the sociopolitical-turn moment (2000s–) in mathematics education research. Gutiérrez (2010) marked the *sociopolitical turn* as signaling "the shift in theoretical perspectives that see knowledge, power, and identity as interwoven and arising from (and constituted within) social discourses" (p. 4). Researchers who position their work within the sociopolitical-turn moment use familiar theoretical perspectives in novel and unexpected ways and/or embrace contemporary theoretical perspectives to formulate different questions and possibilities for mathematics education (e.g., Berry, 2008; Gutstein, 2003; Martin, 2010; Walshaw, 2001). The sociopolitical-turn moment, as we envision it, permits mathematics education researchers to problematize the Instructional Triangle—its existence, its assumptions, and its implications—by maintaining the exhausting process of concurrently zooming out and zooming in on the triangle only to zoom out and in yet again. This simultaneous zooming out/in steals the innocence of the Instructional Triangle, deconstructing it, as the discursive binaries used to name the vertices, and thus the triangle, are put under erasure (cf. Derrida, 1974/1997).

Here, students, teachers, and mathematics are understood as discursive formations (cf. Foucault, 1969/1972), named and re-named (but not determined) within hegemonic sociocultural, sociohistorical, and sociopolitical assumptions, conditions, and power relations. With this simultaneously zooming out/in, the vertices are no longer brought into focus, but become monsters, no longer intelligible, as they resist the surveilling and disciplining gazes of normalization (cf. Foucault, 1977/1995). As the vertices become unintelligible, it provides different possibilities for the vertices; thus, different possibilities for the Instructional Triangle and mathematics teaching and learning in general. The sociopolitical-turn moment has the potential to move mathematics education researchers away from the research agenda that explores "primarily questions of *how* to improve possibilities for teaching and learning of mathematics, toward a research agenda strongly concerned with the question of *why* mathematics education" (Pais, Stentoft, & Valero, 2010, p. 369, emphasis in original). In exploring this—in many ways, forbidden—why question, mathematics education as a research domain is cracked wide open, revealing its inclusions and exclusions (Skovsmose, 2005). Within the sociopolitical-turn moment, we believe that CPT provides a means to not only ask this forbidden why question but also other why and how questions, opening up different possibilities for mathematics education research.

Working Against Theoretical Fundamentalism

In this section, we briefly summarize critical theory and postmodern theory from our current understandings of these complex and far-reaching theories, and suggest that concepts from both theoretical perspectives might be used side by side—like tools pulled from a tool box—to short-circuit systems of power (Foucault, 1975/1996b). Although some researchers might view conflicting theoretical perspectives as incompatible, they also can be viewed as *complementary* (i.e., exploring different aspects of the same phenomena) or *incommensurable* (i.e., using different languages rather than really being incompatible) (Sfard, 2003). We believe that to capture the complexities and multiplicities of contexts when making sense of social phenomena, it often requires sifting data through one theoretical sieve, analyzing what is captured, and then catching that which remains with the next sieve of theory. Effective use of theory, therefore, requires that the researcher assume the responsibility of scholarly work; that is, the difficult intellectual work of studying the strengths and weaknesses and the convergences and divergences of different theoretical concepts pulled from (at times) conflicting theoretical perspectives (Paul & Marfo, 2001).

Critical Theory

Critical theory emerges from a Marxist tradition within the Frankfurt School (*circa* 1920) of challenging asymmetrical power relationships (Bottomore, 1991). As an activist and emancipatory project, critical theory calls its claimant to question the structures that are developed and maintained by "constructors" (Skovsmose, 2005, p. 140) and manifested as false consciousness for those who are constructed within hegemonic power. Hegemony constructs people as *objects*—those who are acted upon, rather than *Subjects*, those who act—who become so entrenched in their own oppressive condition that

they do not realize their own subjugation or their complicity in the perpetuation of unjust social and economic systems (Freire, 1970/2000). Employing critical theory, therefore, requires the researcher to use her or his scholarship to dismantle the constructors' hegemonic power and the reproduction and execution of that power through institutions such as media and schools (Slott, 2002). She or he must consider how her or his scholarship—and even her or his language—supports or subverts hegemonic assumptions (Agger, 1991). In so doing, the critical theorist questions the production, validation, dissemination, and reproduction of knowledge through these institutions. Critical theorists, therefore, call for all efforts to disseminate knowledge to be accompanied by an investigation of not only its relation to ideology and power but also the subjectivities of the researcher (Leistyna & Woodrum, 1996). Through this investigation, critical theorists aim to transform existing power relations in a redemptive struggle for the humanization of people (Freire, 1970/2000). As a modernist project, embedded in the Enlightenment, critical theorists believe that as marginalized groups become critically aware of their "true" situation, intervene in its reality, and take charge of their destiny, they will exercise their right to engage in the sociohistorical transformation of their society (Crotty, 1998).

Postmodern Theory

Postmodern theory is a critique of the Enlightenment that rejects any static foundational systems of logic, resulting in truth—and thus, knowledge—becoming fluid and avoiding absolution (Seidman, 1994). Postmodern thought, however, is not a denial of the existence of truth but rather an acceptance of multiple forms of truth, made and remade within sociocultural, sociohistorical, and sociopolitical discourses (Foucault, 1984/1996a). But here discourses are no longer the mere intersections of things and words that might be spoken, heard, or read but rather "practices that systematically form the objects of which they speak" (Foucault, 1969/1972, p. 49). Knowledge then, for the postmodern theorist, is a discursive formation (cf. Foucault, 1969/1972); it no longer maintains its privileged status as an objective order of things but rather is subjected to and limited by the very sociocultural, sociohistorical, and sociopolitical assumptions, conditions, and power relations against which "true" knowledge within the Enlightenment claimed immunity (cf. Foucault, 1970/1994). Working in postmodern theory, therefore, is "a movement of 'unmaking'" (R. Wolin, cited in Crotty, 1998, p. 192). This unmaking pulls apart or deconstructs (cf. Derrida, 1974/1997) reductionist discursive binaries—truth/untruth, rational/irrational, objective/subjective, man/woman, white/black, teacher/student—as a means to unsettle and displace binary hierarchies, to uncover their historically contingent origin and politically charged roles, there inclusions and exclusions. The aim of deconstruction, however, is not to provide a "better" or "truer" foundation for knowledge and society but rather to dislodge the dominance (i.e., power) of discursive binary hierarchies, creating a social space that is tolerant of difference, ambiguity, and playful innovations which support autonomy and democracy (Seidman, 1994). In embracing difference and ambiguity, the postmodern theorist rejects the single story or grand meta-narrative (Lyotard, 1979/1984) that attempts to sanitize knowledge of difference and ambiguity. Here, the single story or grand meta-narrative of "science" is merely an illusion because it is not possible to control historical events that escape the clutches of reason and rationality (Usher & Edwards, 1994); objectivity is a mere fiction.

Critical Postmodern Theory

Employing concepts from critical theory and postmodern theory—or any other theoretical combination—side by side is messy work that is "necessary and fruitful in 'the search for meaning'" (Cook, as cited in Lather, 2010, p. 9). Working against theoretical fundamentalism (Lather, 2006), CPT operates as a differential consciousness, which Sandoval (2004) described as representative of the variance that emerges out of correlations, intensities, junctures, and crises. As we consider critical theory and postmodern theory independently, we encounter such variance from which CPT—the synergy of the two—emerges (Kincheloe & McLaren, 1994). To illustrate this synergy, we provide an example of how oppression (or marginalization) and resistance might be reconceptualized when considering the both-and theoretical perspective of critical postmodern theory rather than the either-or perspective.

While both critical theorists and postmodern theorists are concerned with oppression and resistance, their approaches are indeed significantly different. Critical theory addresses oppression by focusing, often to the point of tunnel vision, on the oppressed. Critical theorists see liberation or emancipation for the oppressed as a worthy and attainable goal achieved through praxis—a recursive process of critical reflection followed by action—what Lather (1991) defined as "philosophy becoming practical" (p. 11). Through praxis, the critical theorist works on behalf of the oppressed frequently without regard for ethical relations with the oppressor. The goal for the critical theorists becomes for the oppressed to reverse the oppressor/oppressed binary, for the oppressed to assume the position of power held by the oppressor. Once this reversal or power shift occurs, too often there is no further action (World history repeatedly validates this claim). This reversal leads us to see critical theory as a contradiction upon itself as an emancipatory project. By restricting itself to the oppressor/oppressed binary, the oppressed can assume no position beyond that of oppressor. This limiting of possibilities is still oppressive and yields no real sense of liberation. To speak more broadly, in the surge for liberation, the critical theorist is often seduced into overturning one régime of truth with yet another régime (cf. Foucault, 1977/1980).

Postmodern theory, on the other hand, provides a way out of this contradiction; it advocates for the erasure of all boundaries through decentralization, thus eliminating the need for emancipation, as it is not necessary to free one who is not bound. By deconstructing the binary between the oppressed and the oppressor and placing both binaries (i.e., oppressor/oppressed and oppressed/oppressor) under erasure, postmodern theory addresses the contradiction within critical theory by leaving the subject (i.e., the individual) open to infinite possibilities. Through deconstructing reductionist binaries and troubling emancipatory régimes of truth, the subject lives in a perpetual state of becoming her or his best self, while working within/against sociocultural, sociohistorical, and sociopolitical discourses. The irruption of the oppressed/oppressor binary eliminates the need for the us-them or self-other argument, allowing researchers to work the hyphen that separates the two (Fine, 1994). It is within this hyphenated space that ethics gains prominence. To exist with others within the hyphen, the subject must constantly be aware of the incompleteness of her or his ethical dealings with her or his self and with others. The emancipation of critical theory is too often not without casualties; postmodern theory requires a continuous ethical awareness of and responsibility for these casualties.

Closing Thoughts

Postmodern theorists in general advise caution with the emancipatory nature of critical theory because "any emancipatory perspective presupposes values which cannot be agreed upon universally or permanently" (Brown & Jones, 2001, p. 4). This cautious stance, however, causes critics of postmodern theory to claim that it "is an obstacle to the formation of open and radical perspectives that challenge inequalities and the deepening of the rule of capital in all areas of social life" (Rikowski & McLaren, 2002, p. 3). We believe, however, borrowing from Lather (2006), that both the seductions of and resistance to postmodern theory can assist us in getting smart about the limits of critical theory. Or, said in another way, the synergy between critical theory and postmodern theory is found in the "interplay between the praxis of the critical and the radical uncertainty of the postmodern" (Kincheloe & McLaren, 1994, p, 144). By integrating critical theory and postmodern theory, CPT cautiously uses the activist praxis of critical theory to restore hope—and therefore, action—to the (too often) inaction of postmodern theory.

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