

Mathematical Inqu[ee]ry: beyond ‘Add-Queers-and-Stir’ elementary mathematics education

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While elementary educators have developed queer pedagogies and perspectives in many subjects from reading to music, science to English as a second language, queer perspectives on elementary mathematics education are remarkably absent. This article differentiates between two common uses of the term ‘queer’ and delineates two sets of approaches based upon them: approaches shaped by ‘queer liberalism’ with a focus on inclusion, which result in what might be called ‘Add-Queers-and-Stir’ elementary mathematics education; and ‘Mathematical Inqu[ee]ry’, a queer theoretical approach, in which students and teachers might queer ‘family,’ ‘rhetoric,’ and ‘time’ in an elementary classroom. Mathematical Inqu[ee]ry goes beyond mere inclusion of queer students and issues into extant frameworks and allows elementary teachers and students to deconstruct and disrupt educational norms as well as imagine new possibilities in mathematics and in the world.

Introduction

I realize I am holding my breath. My stomach turns over and I try to think of a way not to do this. Maybe I should review the story elements or have the students brainstorm literary genres. But I didn’t write a back-up lesson plan. I glance at the two parents sitting at the back of the room. Their presence stokes the nervous fire in my stomach (and I chastise myself for my internalized homophobia), but at the same time I am relieved that they have come. I will have adult witnesses if the students go home saying that their English Writing teacher was talking about sex in class. Because of course, that is not the point of this lesson; hopefully my adult witnesses will understand that. Or are the kids the ones who are more likely to understand this point? While Sears has noted that ‘[t]eaching queerly is not teaching sex’ (1999, 4), King and Schneider have observed that:

[f]or many undergraduates [and other adults], homosexuality, even in children’s literature, is about only sex. And because it is “inappropriate” to teach sex in elementary classrooms, homosexuality is relegated to the taboo list. ... [The] problem in this argument is the mistaken reduction of all talk about homosexuality as talk about sex. (1999, 130)

I wonder also whether it is the parents or children who are more likely to realize that ‘sexuality is present and visible, although generally unremarked, in the public images experienced by virtually all children’ (Bickmore 1999; referring to Richardson 1998) and that absences say as much as who and what is present (Foucault 1978; Letts 1999; Fine 1993; hooks 1994). I take a deep breath and begin.

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Queerable subjects

Some school subjects are more queerable than others, or so it seems from looking at my own teaching practice as well as the research and theoretical literature in education. The opening anecdote of this chapter spotlights my first attempt at queering my teaching with elementary-age students. I am not the only educator to choose a subject other than mathematics as a beginning place for queer teaching. In the title of Boutillier's (1994) book chapter 'Reading, Writing, and Rita Mae Brown,' an author's name notably replaces 'Rithmetic' in the historical 'three Rs' of elementary education. In Jana Jackson's (2001) synthesis of queer research in education, article/book chapter titles mentioned literature three times, English twice, and reading, writing, and history once each; however, mathematics is absent. In 1995, Deborah Britzman encouraged us to stop reading straight; while Britzman's use of the word 'reading' in this essay is not literal, the term 'reading' in a broad sense still suggests a connection with subject areas other than mathematics. Debbie Epstein (2000) has used Butler's ideas of performativity related to gender and sexuality to analyze how nine and 10 year olds responded to texts in which lesbian mothers were represented. Dipti Desai (2003) used queer theory to contest versions of multicultural art education that limit understandings of the ways in which sexuality intersects with race, ethnicity, gender, and social class. Cynthia Nelson (for example, 1999, 2002, 2008) has written extensively on queer theory in English as a second language education. The original *Queering Elementary Education* (Letts and Sears 1999) included a curriculum section addressing myriad subject areas. As I did in the opening anecdote, James R. King and Jenifer Jasinski Schneider as well as Wayne Martino (Martino 1999) chose language arts as the school subject to queer. Mara Sapon-Shevin (Sapon-Shevin 1999) sent out a queer branch into music education, while Kevin P. Colleary (Colleary 1999) addressed queer content in social studies and William J. Letts challenged heteronormativity in science. Mathematics remained the subject that dare not speak its name. The time has come to queer elementary mathematics education.

Mathematics education: queering the unqueerable

Mathematics education is a young field of academic inquiry that emerged in the 1970s out of conversations between two main groups: psychologists focused on mathematics as a domain for analyzing cognition and learning, and educationalists with a special interest in mathematics (de Corte, Greer, and Verschaffel 1996). One reason mathematics has been a chosen subject for cognitive psychologists is that mathematics has generally been perceived as a neutral, unbiased subject. 'More than any other subject,' writes Kumashiro (2004, 95), 'math is considered by many people to be the least influenced by social factors and, therefore, to be the most bias-free of all subjects being taught and learned in school.' Comments such as 'I never realized you could teach math multiculturally' demonstrate this idea among teacher candidates. However, critical mathematics educators have recognized that 'what and how we teach [math] are influenced by social factors and do have hidden messages that often reinforce oppression' (Kumashiro 2004, 95). Mathematics educators must make decisions about what will be included and excluded in the mathematics curriculum: '[w]hich properties of arithmetic, which formulas in algebra, which theorems in geometry, and in what context, and for what purpose' (Kumashiro 2004, 96). These considerations have led to a number of critical perspectives in mathematics education, including culturally relevant pedagogy, critical mathematical literacy, critical race theory, and feminist perspectives on mathematics education. While these critical perspectives have examined ways to work against the racism, sexism, and classism pervasive in schools, none of them take into consideration the multisexual

(see, for example, Atkinson 2002; Nelson 2009) population of students and families involved in schools, nor have they incorporated insights from queer theory. Before envisioning queer perspectives on elementary mathematics education, it is important first to consider what is meant by ‘queer.’

Queer: a tale of two meanings

Annamarie Jagose began her book *Queer theory* with this concise history of the term ‘queer’:

Once the term ‘queer’ was, at best, slang for homosexual, at worst, a term of homophobic abuse. In recent years, ‘queer’ has come to be used differently, sometimes as an umbrella term for a coalition of culturally marginal sexual self-identifications and at other times to describe a nascent theoretical model which has developed out of more traditional lesbian and gay studies. (1996, 1)

This brief historical overview points to two different ways the single word ‘queer’ is commonly used in contemporary speech and writing: as a reference to a set of minority sexual and gender identities (i.e. as shorthand for the expandable list Lesbian, Gay, Bisexual, Transgender, Intersex, Queer . . .); and in the sense of queer theory. A tension exists between these two uses: while the first one is based in the tradition of liberal theory and is founded on the notion of identity as fixed and part of an essential self, the second use in the sense of queer theory alludes to a view of identity as unfixed, contingent, and in a process of constant reconstitution through discursive practices (Foucault 1978; Butler 1990, 1993; Sedgwick 1993; Sumara and Davis 1998; Warner 1999; Talburt and Steinberg 2000; Curran 2006). Further, ‘queer’ in the first sense is defined against heterosexuality, whereas in the second sense the term is defined against normalcy or normativity (Warner 1993; Curran 2006). In the introduction to the queer studies special issue of *Social Text*, David L. Eng with Judith Halberstam and José Esteban Muñoz (2005) point out the irony of this polysemy as they raise the question, ‘Is “queer liberalism” no longer a paradox?’ They write:

[T]he emergence of “queer liberalism” marks an unsettling though perhaps not entirely unexpected attempt to reconcile the radical political aspirations of queer studies’ subjectless critique with the contemporary liberal demands of a nationalist gay and lesbian U.S. citizen-subject petitioning for rights and recognition before the law. Indeed, our current historical moment is marked by a particular coming together of economic and political spheres that form the basis for liberal inclusion. (Eng, Halberstam, and Muñoz 2005, 10)

In this article, I attempt to clarify what might be meant by ‘queering elementary mathematics education’ given this ironic double signification of ‘queer.’ In the first case, approaches shaped by ‘queer liberalism’ with a focus on equal rights and representation result in what might be called ‘Add-Queers-and-Stir¹ Elementary Mathematics Education.’ These approaches are achieved by inserting ‘queer’ liberal rights discourse into extant critical approaches² to elementary mathematics education. A queer theoretical perspective, on the other hand, refuses simple ‘inclusion’ and ‘representation’ as solutions. Mathematical Inqu[ee]ry, as this perspective might be called, follows Cynthia Nelson’s (1999) call to move beyond inclusion to inquiry in teaching. Mathematical Inqu[ee]ry goes beyond mere inclusion of queer students, families, and issues into extant frameworks and allows elementary teachers and students to deconstruct and disrupt educational norms as well as imagine new possibilities in mathematics and in the world.

Add-Queers-and-Stir elementary mathematics education

It was not until graduate school that I was assigned readings that mentioned queer people or experienced discussions about queer issues in class. It is hard to describe how incredible

these readings and discussions seemed when they occurred. For those who have *not* been included or represented in educational contexts, inclusion has a strong allure, although simple inclusion or representation ultimately fails to live up to its appeal. Although the next section will examine the limitations of the Add-Queers-and-Stir perspective and explore ways to go beyond a liberal inclusion-based approach, it seems useful to first detail the forms this approach might take. First, since ‘queer’ in mathematics education is as of yet noticeable mainly in its absence, imagining the potential of queer presence opens possibilities (despite limitations). Second, elaboration of a perspective based in liberal discourse provides a starting place for imagining how to move beyond such a perspective.

Adding queer to culturally relevant mathematics teaching

Culturally relevant teachers (Ladson-Billings 1994) recognize that ‘negative effects are brought about [for African American students] . . . by not seeing one’s history, culture, or background represented in the textbook or curriculum or by seeing that history, culture, or background distorted’ (Ladson-Billings 1994, 17). Culturally relevant teachers therefore use ‘student culture in order to maintain it and to transcend the negative effects of the dominant culture’ (Ladson-Billings 1994, 17). In this way, ‘[s]tudents’ real-life experiences are legitimized as they become part of the “official” curriculum’ (Ladson-Billings 1994, 117). The ideas of culturally relevant teaching can be extended to queer students and children with queer family members by incorporating representations of queer people into the mathematics curriculum.

As a first example, a first-grade teacher might use the following scenario for a story problem:

We want your families to come for ‘Curriculum Night.’ Your families will play math games. One game is called ‘Pattern Block Pictures.’ Each person will make a picture with paper shapes and glue. Each person will need 4 hexagons, 3 trapezoids, 5 triangles, 4 blue parallelograms, and 6 white parallelograms. 2 kids live with two moms. 1 kid lives with two dads. 1 kid lives with two moms sometimes and a mom and a dad other times. 8 kids live with a dad and a mom. 3 kids live with a mom. 1 kid lives with a dad. 2 kids live with a grandma. 4 brothers and 2 sisters will play the game too.

The teacher poses questions such as the following: How many people in all will play the game? How many hexagons do we need in all? How many blue parallelograms do we need in all? How many more triangles than trapezoids does each person need? How many hexagons will the grandmas use together? How many triangles can you fit on one sheet of paper? How many sheets of paper will we need so that we will have enough triangles for everyone?

As another example, a third-grade teacher might incorporate queer symbols into a geometry lesson. The teacher passes out buttons, bumper stickers and other items with symbols such as pink triangles, gay flags, interlocking female or male symbols, and so forth. The teacher poses the following questions: What is the area and perimeter of each symbol? For two interlocking female symbols, what is the area of the overlapping part? What fraction of the gay flag is green and blue? How could you construct a pink triangle that has twice the perimeter of the one on the button? In these two examples, teachers pose questions that challenge students to think and do mathematics in the context of a queer-inclusive scenario.

Adding queer to critical mathematics literacy

Critical mathematical literacy ‘involves the ability to ask basic statistical questions in order to deepen one’s appreciation of particular issues’ (Frankenstein 1990, 105).

This approach focuses on issues of race, class, and gender to examine ‘how most current uses of mathematics support hegemonic ideologies, how mathematics education also reinforces hegemonic ideologies, and how critical mathematics education can develop critical understanding and lead to critical action’ (Frankenstein 1983, 327). Extending critical mathematical literacy to queer issues entails engaging students in critical analysis of statistics that reveal homophobia and heterosexism.

An example might consist of a class of third-grade students investigating straight and queer representations in books in their school library. The teacher poses the following questions: What fraction of the books (or a sample of the books) mentions queer students or families with queer members? Is this different for chapter books as compared with picture books? If so, what is the numerical difference? How does the fraction of books in the school library that mention queer people compare with the fraction of their third-grade classroom library or with the public library? Students could follow up this project with letters or meetings with the school and/or public media specialist suggesting books acquisitions or communicating with the Parent–Teacher Association about fund-raisers to purchase books.

Adding queer to critical race theory

A third set of scholars, critical race theorists, argue that class-based or gender-based analyses cannot fully explain inequities and that race must be a central analytic (Ladson-Billings and Tate 1995). According to critical race theory, race is endemic to US society and racism is ‘normal’ rather than aberrant (Delgado 1995). Critical race theorists point out that the United States was founded on property rights rather than civil rights and that civil rights activism will always fall short of its promise unless this fact is considered (Ladson-Billings and Tate 1995). Specifically, the fact that enslaved African Americans were considered property has had a lasting effect on United States society. Critical race theory aims to reveal the way race and racism continue to structure US society. One way critical race theorists do this is through the telling of counter-narratives (Solórzano and Yasso 2002). Extending the critical race perspective to queer issues in elementary mathematics would entail using mathematical counter-narratives not only to challenge dominant racialized tales, but also heteronormative tales.

An example with fifth-graders might include finding a list of national historical events. Using the list, students construct a timeline to scale so that the distances between dates correlate with the amount of time between events. Students then evaluate the timeline for representation of queer history, history of people of color, and history of queer people of color. Students could then add events from queer history, history of people of color, and history of queer people of color to the timeline, making sure to keep the timeline to scale.

In another example with a fourth-grade class, students might examine local newspapers and explore the following questions: In the local newspaper with the highest number of readers, what percentage of the articles mention queer people or issues? Of these, what percentage portray queer people in positive ways, negative ways, and mixed positive and negative ways? What percentage of articles mention people of color? Of these, what percentage portray people of color in positive ways, negative ways, and mixed positive and negative ways? What percentage of the articles specifically mention queer people of color? Of these, what percentage portray queer people of color in positive ways, negative ways, and mixed positive and negative ways? After examining these percentages in the local newspaper with the highest number of readers, students could examine the same questions in a local queer newspaper and local newspapers targeting

communities of color. What stories do these different percentages tell? Students could write letters to the editors of each of these newspapers sharing these findings and pointing out who is being included and excluded in each newspaper. These letters could serve as counter-narratives challenging both racism and heteronormativity.

Adding queer to feminist perspectives on elementary mathematics education

Feminist views comprise a final set of critical perspectives. These perspectives are multiple and diverse. For example, Jacobs and Baker (1997) build on the work of Belenky et al. (1986) in *Women's ways of knowing* to suggest that mathematics educators should use students' own experiences to build connected knowing, integrate writing into mathematics instruction, use cooperative learning, and focus on building a community of learners. In contrast, Walkerdine (1998) uses the lens of poststructuralism to analyze femininity as a site of struggle as the discourses inside and outside mathematics classrooms 'count girls out' of the mathematical arena. What is common among feminist perspectives is a focus on gender as an analytic category in examining mathematics education. Extending feminist ideas to incorporate queer students involves recognizing the ways in which homophobia and heterosexism collude with sexism to privilege straight people and men, and oppress gay men, lesbians, bisexual people, and straight women.

As an example, fifth-grade students might investigate the mathematical implications of marriage laws that allow straight couples, but not same-sex couples, to legally marry. Students compare the economic implications of marital status for two couples with equal incomes. Examining this difference at various income levels would probably reveal class differences in the effect as well. Adding a feminist lens to the example might lead the fifth-grade class to insist that the gender of the same-sex couple matters. Because women's wages are on average lower than men's, average incomes for lesbian couples, gay male couples, and heterosexual couples will differ. Taking into consideration class and gender allows for a more complex understanding of how heterosexism/homophobia, classism, and sexism collude in creating inequities.

Mathematical Inquiry: a queer theoretical perspective on elementary mathematics education

The previous section explored how to extend existing critical perspectives on mathematics education to include queer people and topics. However, queer theory rejects 'inclusion' as a solution because queer theory rejects the very idea of an enduring 'self-identical subject' that could conceivably be 'fully represented' or 'included.' According to Judith Butler (1993), any identity category, including 'queer,' is contingent, a 'necessary error' required for affiliation. What follows from this premise is that 'queer' can never have a fixed political referent; that it 'will not fully describe those it purports to represent' (Butler 1993, 571). In the absence of fixed referents, any representation will fail to live up to the alluring promise of inclusion. Cynthia Nelson (1999) encourages educators to move beyond inclusion to inquiry in their teaching. In an elementary mathematics classroom, this means more than asking students to see and discern mathematical relationships (Hiebert et al. 1997), discover new problem-solving strategies (Carpenter et al. 1999), or query each other about their mathematical thinking (Whiteneck and Yackel 2002); it means questioning the tasks, the strategies, the very ways of thinking and doing mathematics, as well as the way mathematics is used to interpret and act in the world. In short, it means

interrogating the ‘regimes of the normal’ (Warner 1993) in the elementary mathematics classroom.

Queering family in elementary mathematics classrooms

‘Family,’ like ‘queer,’ has proven polysemous, figuring as fully heterosexual and in opposition to ‘queer’ in the discourses of groups like ‘Focus on the Family,’ but as a code word for ‘queer’ when the statement ‘Yeah, she’s (or he’s) family’ is used to signify that someone is ‘queer.’ Lisa Duggan has analyzed the recent historical development of ‘homonormativity,’ a ‘new neoliberal sexual politics . . . that does not contest dominant heteronormative assumptions and institutions, but upholds and sustains them’ (Duggan 2003, 50). Within this new politics, ‘queer’ and ‘family’ have merged in the current narrow focus on gay marriage; this formulation has involved ‘rhetorically remapping and recoding freedom and liberation in narrow terms of privacy, domesticity, and the unfettered ability to consume the “free” market’ (Eng, Halberstam, and Muñoz 2005, 11).

Two of the examples in the ‘Add-Queers-and-Stir’ section fit loosely within this paradigm. In one example, the teacher uses a story problem scenario with representations of families of many different configurations including those with same-sex couples. In another example, a class investigates the economic implications of the legal right to marry. While these examples make attempts to include ‘queer’ families in the mathematics tasks, in many ways they leave dominant notions of family intact. Mathematical Inquiry pushes teachers and students to take the level of interrogation one step further to question these dominant conceptions of family themselves. In the example with first-grade students, the teacher could challenge students with the following questions: What types of families are still left out of the story problem? What are other ways to think about family besides who *lives* with you? When we talk about families in only this way, how does that make it hard to think about family in other ways? Why are only certain shapes included in the pattern block sets that families will use during ‘Curriculum Night’? What types of pictures do these shapes make possible and impossible? Could we make up a shape that does not even have a name? Could there be types of shapes and families we have not even thought of yet? These questions respond to the call in the document *Beyond same-sex marriage* for ‘a new vision for securing governmental and private institutional recognition of diverse kinds of partnerships, households, kinship relationships and families’ (April Working Group 2006). Following this model, the fifth-grade class could use the investigations of the economic implications of legal eligibility for marriage as a starting point for imagining alternative possibilities for familial affiliation as well as economic systems of income, healthcare, taxes, housing, and child care. These two examples with first-grade and fifth-grade students move beyond including queer families to interrogating what constitutes a family and imagining new ways to build families and societies.

Queering rhetoric in elementary mathematics classrooms

Kenji Yoshino (1996) tells the story of his clerkship interview with a judge who had recently heard a case concerning whether gay people should be accorded heightened scrutiny under the US Constitution’s Fourteenth Amendment’s Equal Protection Clause. Despite the judge’s involvement in this case, it turned out that the judge was completely unfamiliar with the pink triangle. ‘My shock,’ writes Yoshino, ‘was fueled . . . less by the judge’s ignorance about gays than by the thought that his ignorance of the pink triangle

had pointed relevance to the doctrinal analysis in the case he had just decided' (1996, 1756). As a symbol of the persecution of gay people in the Holocaust, the pink triangle directly addressed whether gay people had 'suffered a history of discrimination,' one of the three prongs of the heightened scrutiny inquiry mandated by the Equal Protection Clause. Throughout the rest of the article, Yoshino examines how symbols such as the pink triangle 'provide a "thicker" response to the Equal Protection inquiry than has been attempted under the conventional doctrinal framework.' In this way, Yoshino raises questions about what counts as an argument in the courtroom.

Mathematical Inqu[ee]ry raises the same question about the mathematics classroom. Two of the examples in the previous section involve students in using mathematics to investigate and analyze media representations: third-graders analyzed the library's collection of books, and fourth-graders analyzed newspaper representations. In each of these examples, students make arguments using mathematics. In the context of Mathematical Inqu[ee]ry, teachers and students could address the rhetorical strategy of making arguments using numbers: When and where do people make arguments using percentages or fractions? What are other ways to make the same arguments without using numbers? What does using fractions or percentages leave out that other ways of making a point do not and vice versa? Can the same numbers, fractions, or percentages be used to make contradictory arguments? When and where do people make arguments in ways other than using numbers? Within such an Inqu[ee]ry, teachers and students 'stop mathematizing straight.'³

Queering time in elementary mathematics classrooms

In 'Time Binds, or, Erotohistoriography,' Elizabeth Freeman notes that 'chronopolitics' involves:

the management of entire populations: both the state and the market produce biopolitical status relations not only through borders ... and other strategies of spatial containment, but also and crucially through temporal mechanisms. Some groups have their needs and freedoms deferred or snatched away, and some don't ... some human experiences officially count as life or one of its parts, and some don't. Those forced to wait ... whose activities do not show up on the official time line ... are variously and often simultaneously black, female, queer. (2005, 57)

Added to this list might be 'young.' If we are to 'envision a politics where one's relation to power, and not some homogenized identity, is privileged in determining one's political comrades' (Cohen 2005, 22), then children may very well find themselves arm-in-arm with 'punks, bulldaggers, and welfare queens' (some of whom may be their family members) together performing 'progressive transformative coalition work' (Cohen 2005, 22). As Eric Rofes suggests:

the abuses of power foisted on children in the name of 'child protection,' 'child defense,' or 'child welfare' may be well-intended attempts to offer care and sustenance, but they do little to displace a construction and lived reality of childhood that do their best to leave a significant portion of our population economically dependent, socially isolated, and politically disenfranchised. (2005, 5)

... We must examine the ways colonizing approaches to childhood ... have inspired the current organization of schools, classrooms, and pedagogy ... This involves a fundamental rethinking toward many of the theories and practices held dear, even by progressive educators: developmentalism, forms of classroom management, forced schooling. (2005, 138)

In the elementary mathematics classroom, Inqu[ee]ry might mean interrogating the chronopolitics of developmentalism, classroom routines, and daily schedules. Moving beyond constructing a historical timeline to scale, then literally 'adding queers' to it, the

fifth-grade class might investigate the ways in which time is measured and regulated within classrooms, the school, and society, and imagine alternative ways to measure (or unmeasured), mark, and spend/fill/use/experience/feel time in their classroom and their lives.

These examples envision what it might mean to queer elementary mathematics education: first in the neoliberal sense of ‘adding-Queers’ to elementary mathematics education, and second moving beyond inclusion to Mathematical Inqu[ee]ry to interrogate normativity in mathematics, classrooms, and society. A mathematics joke I once heard went something like this: ‘There are ten kinds of mathematicians: those who only think in binaries and those who don’t.’ Queering elementary mathematics education means pushing beyond binaries, questioning the (selective) tradition in the world of mathematics as well as using mathematics to pose questions about the world, and imagining new possibilities. In the words of Sonya Kovalevsky, ‘Many ... consider [mathematics] an arid science. In reality, however, it is a science which requires a great amount of imagination’ (Platonic Realms 1997–2008).

Notes

1. In the context of ecofeminist theory, Catriona Sandilands remarked, ‘It is not enough simply to add “heterosexism” to the long list of dominations that shape our relations to nature, to pretend we can just “add queers and stir”’ (1994, 21).
2. Here I do not mean to imply that these critical approaches themselves are necessarily based on liberal theory.
3. This alludes to Britzman’s (1995) article ‘Is there a queer pedagogy? Or, stop reading straight.’

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