Commentary on the Chapter by Dowling and Burke, "Shall We Do Politics or Learn Some Maths Today? Representing and Interrogating Social Inequality"

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This chapter posits the following conundrum: Is it possible to structure a mathematics lesson that integrates questioning of social inequality with worthwhile mathematical material? Dowling and Burke answer this question negatively. They conclude that a lesson must either privilege mathematics, providing all students with appropriate and rigorous mathematical content, or a lesson must privilege political motivations, providing for a full and extensive discussion of critical issues; according to the authors, it is not possible to accomplish both goals at the same time.

The authors present a theoretical model for considering representations of social (in)equality; examples come from photographs and mathematics textbooks. The images the authors analyze are considered on two variables of representation: expression of inequality (tacit or explicit); and consonance (or dissonance) with expected patterns of behavior. The concepts of invisibility and stereotype relate to tacit and explicit expressions of inequality, respectively, representations that are consonant with prevailing views of the target group in society. Tokenism and interrogation, on the other hand, are categories that are dissonant with the prevailing patterns.

This model affords a theoretical framework that can be useful to help analyze mathematics textbooks, but the model is also useful for analyzing representations in other mathematics education contexts such as the classroom. Various studies in Western countries have analyzed textbooks for gender inclusion, but most lack a framework such as this one that allows a qualitative consideration of representations, not just a quantitative one (see, for example, Schniedewind and Davidson 2006, pp. 220–222).

Dowling and Burke provide interesting examples analyzing various representations of gender and social class through the lens of this expression/orientation framework, examples that help the reader construct meaning for their categories. They rightly point out that materials such as textbooks cannot be evaluated fully

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without considering the context and conditions of their use. Thus a text that is absent in significant female representation might be used by a teacher as a means of interrogating prevailing patterns of gender (in)equality in the culture, reducing the potential harmful impact of the text material itself.

Ultimately the conclusion reached by Dowling and Burke that it is not possible to privilege both mathematics and political goals, is a bit discouraging for those committed to social justice issues. One weakness of the chapter is a lack of approaches other than integration of politics and mathematics that might be examined. Perhaps a multicultural perspective on issues of social inequality can provide one alternative lens through which to examine the dilemma posed by Dowling and Burke. This perspective may also provide some guidance for how teachers and teacher educators can meet the challenge posed to teach mathematics for social justice.

Multicultural education in the U.S. grew out of the civil rights movement, and thus offers a vision, yet to be reached, of democracy, social justice and equality. Multicultural mathematics education proposes that schools and teachers should help students develop skills they need to analyze critical social justice issues in their own environment and learn to work collectively to address these issues (see Sleeter 1997). As Banks and Banks (2003) have stated, teachers and students need to be critical consumers of mathematics, while at the same time recognizing how mathematics can be useful (or limited) for questions they themselves might pose about their own environment or cultural context.

Banks (1993) identified four approaches to multicultural education: the contribution approach; the additive approach; the transformation approach; and the social action approach. These approaches to multicultural education would be characterized as dissonant from patterns in society relative to specific cultural groups, to use Dowling's and Burke's framework. The contributions approach utilizes cultural components such as holidays in the curriculum without changing its structure, an approach Dowling and Burke might characterize as tokenism; an example might be including some activity during Black History Month (February in the U.S.) that highlights contributions of African Americans to mathematics and science. In the additive approach, content, concepts, and perspectives are added to the curriculum while leaving its structure unchanged and unquestioned, another example of tokenism, albeit a more thoughtful and extensive approach (see, for example, Krause 1983; Zaslavsky 1991). The transformation and the social action approaches better fit the example from Gutstein that Dowling and Burke critique. [While I was unable to locate the Gutstein article the authors refer to, the reader may consult Gutstein (2003) for other examples.] In the transformation approach, issues and problems from diverse groups are raised and result in a change of curriculum, while the social action approach additionally helps students take action. The latter two approaches clearly better match Gutstein's work, with all the limitations and problems inherent in it that Dowling and Burke enumerate. They also fit the interrogation strategy of the Dowling and Burke framework.

Thus multicultural mathematics education advocates teaching mathematics in a way that cultivates the mathematical capabilities of students from a wide variety of socio-cultural groups traditionally marginalized in mathematics: students of color;

students whose first language is not English; females; the disabled; and, students from low socioeconomic backgrounds, to mention a few. Multicultural mathematics educators endeavor to teach mathematics *for* social justice, rather than attempting to integrate mathematics and social justice issues. Adapting Sleeter's (1997) definition, a good multicultural mathematics teacher:

- knows how to teach students from historically low-achieving groups to achieve well in mathematics by using their cultural backgrounds as a fertile pedagogical resource;
- challenges lowered expectations for such students in mathematics and works to institutionalize higher expectations;
- creates a culturally pluralistic mathematics curriculum that helps all students see mathematics as a human creation; and,
- connects mathematics concepts with students' lives, helping them use complex mathematical reasoning to analyze social issues of concern to them.

As Sleeter characterizes this stance, it is no more political than a traditional stance that ignores cultural differences. Being mindful of this characterization may be helpful to teachers who face administrative criticism for "politicizing" mathematics, criticism that is no less likely today in the U.S. than 40 years ago, when I had a parent complain about my high school bulletin board display of jobs using mathematics (all male figures) with the header "Women can do these jobs too!" Interrogation of prevailing views on gender (or social class, language minority status, gender identity, disability, or ethnicity) can be dangerous, especially for new teachers.

Of course none of this is easy to accomplish. Murtadha-Watts and D'Ambrosio (1997) detail the difficulties inherent in attempting to transform a K-6 mathematics curriculum using a multicultural approach. These educators aimed not just to improve the achievement of minority groups in mathematics, but also to develop a curriculum that posed societal problems usually within the purview of the humanities or social sciences and use mathematics as a tool to solve them. Thus they were attempting to implement all four of Sleeter's (1997) characteristics of multicultural education. Difficulties arose from the shared understanding of multicultural education, the deep-seated understanding of what mathematics is, the complexities of group deliberation, and the demands involved in the teacher-research process. Gutstein (2003) also identifies the complexities inherent in teaching mathematics for social justice. In his two-year study, he worked with a group of 7th and 8th graders in an urban Latino/a school. As Gutstein phrases it, students began to "*read the world* with mathematics, develop mathematical power, and change their dispositions toward mathematics" (Gutstein 2003, pp. 66; emphasis added). These seem like worthwhile goals, albeit difficult to achieve.

I acknowledge that implementing effective multicultural education is not easy, with the potential to fall prey to the criticisms Dowling and Burke delineate in their chapter. However, it seems that the first two or three points that Sleeter (1997) enumerated are the minimum that should be expected from an exemplary mathematics teacher. While these are not simple to achieve in our preparation or professional development of mathematics teachers, they provide goals that those of us committed

to social justice can seek to reach, without diminishing the extent and rigor of the mathematics we are teaching.

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