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HOW MATH BECAME AN OBJECT OF THE CULTURE WARS

As was true in the nineties, today's fights about math are not entirely about what kids actually learn in their classrooms.

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Illustration by Gizem Vural

Kilpatrick's ideas were taken up by the progressivist movement in education, a powerful force in the

early twentieth century inspired by the work of the philosopher John Dewey and guided by a set of principles that included “freedom for children to develop naturally,” “interest as the motive of all work,” and “teacher as guide, not taskmaster.” These ideas had

their roots in the University of Chicago but ultimately went mainstream when they were championed by professors at the Columbia University Teachers College, where Kilpatrick and Dewey taught. The coalition of anti-math parents and academics had a steady influence on education policy for decades. From the start of the twentieth century to after the Second World War, the percentage of high-school students enrolled in algebra fell. In 1909, roughly fifty-seven per cent of high-school students were enrolled in algebra. By 1955, that number had been cut by more than half to about twenty-five per cent.

The decline in advanced math coincided with what can only be called a revolution in secondary schooling. In 1890, less than seven per cent of fourteen-year-olds were in high school, which was almost entirely the provenance of the wealthy and connected; by the late nineteen-thirties, nearly three out of four children between fourteen and seventeen were enrolled in some form of high school, which meant that schools and educators had a much broader and complicated problem than when they were just figuring out how to prepare the richest kids in the country.

So began the backlash to Kilpatrick and his coalition of progressive educators. Starting in the nineteen-fifties, something called “new math” was introduced into classrooms across the country. This movement promised an acceleration of math education and a new, scientific approach to how kids

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learned, but it didn't really gain much traction until 1957, when the U.S.S.R. launched Sputnik. The ensuing panic about the U.S.'s ability to compete led to nationwide reforms that brought calculus into the high-school curriculum and, for a time, retired the progressivist movement in education.

This same fight has repeated itself on several different occasions since then. The open-education movement of the late nineteen-sixties and nineteen-seventies tried to eliminate curricula and standardized tests, and stop the separation of kids into different grades; some "open schools" even did away with walls and allowed the children to dictate what was taught. The backlash to this approach in the following decade culminated in the "math wars" of the nineteen-nineties, in which a new focus on ameliorating racial inequalities in math achievement came up against a panic about how American children measured up to those in Asia, and the potential economic ramifications of a math deficit. The reformers believed that it was vital to shrink achievement gaps in part because they saw—somewhat correctly—an emerging economy that would be dominated by math-related fields, whether computer science, engineering, or economics. A math gap in schools, in essence, was a preview for accelerating income inequality.

At the heart of the nineties math wars was a relatively progressive report published, in 1980, by the National Council of Teachers of Mathematics (N.C.T.M.), which advocated for group learning and the use of calculators—in favor of "problem solving"—before students had even mastered the basics of arithmetic. Starting in 1989, the report was codified into national math standards that were eventually protested by angry parents—including two particularly heated groups from Princeton, New Jersey and Palo Alto, California—who demanded more advanced math offerings. The conflict lasted years, during which time anti-reform math traditionalists, decrying what they referred to as "fuzzy math,"

had organized themselves into a political force that called for changes in textbooks and lobbied national politicians.

In some ways, the cyclical nature of these arguments makes sense: each generation of parents believes their children are facing problems the world has never seen before. As was true in the nineteen-nineties, today's fights about math are not entirely about what kids actually learn in their classrooms, or how well those lessons prepare the U.S. for competition against a geopolitical enemy. I'd argue that the spectre haunting today's discord over math education is a growing suspicion of the equity-based movement of educators who, as in the early twentieth century, largely come from graduate education programs like the ones at Stanford and Columbia's Teachers College.

Parents tend to express their misgivings with the declaration "I just want my kids to learn math." I have heard this phrase countless times: on social media, in viral clips of school board meetings, and in my own interactions with fellow-parents. I admit that I have even said it myself. The tone differs, but the message is more or less the same: math is the justification, both implicitly and explicitly, for the reaction against progressive curriculum reform in American schools. At an abstract, but deeply felt level, math is the ideal foil for so-called "wokeness" and the infusion of social justice into schools because it is supposed to exist outside of humans and their frivolous emotions. Pi is pi everywhere; two plus two, as they say, equals four.

A recent iteration of the math-backlash cycle was a controversy over the California Mathematics Framework (C.M.F.), the state's math-curriculum guidelines, which get updated about once a decade. The current proposal, which Rivka Galchen [outlined in these pages](#) in September, will be up

for adoption in 2023. It suggests that California address achievement gaps in math by finding alternatives to “tracked” math classes for advanced kids in early education and, in a Kilpatrick-esque turn, creating a data-science track for the high-school students who might not have an interest in calculus. An early draft of the proposal even recommended eliminating algebra instruction at the middle-school level in order to keep the playing field level.

The draft framework was criticized by the usual suspects (math professors, and parents who worry that their kids will go to U.C. Santa Cruz instead of Stanford) but also many equity-focussed educators who worry that the program may be seen as a slackening of expectations for minority and low-income students.

A central figure in the debate was Jo Boaler, a professor at Stanford’s Graduate School of Education and an author of the C.M.F. who has conducted research pointing to the harmful effects of tracked classes. In a study published in 2008, Boaler and her co-author examined three California high schools, including one that de-tracked all of its math courses. Students at that school, she found, “learned more, enjoyed mathematics more and progressed to higher mathematics levels.” These findings have been supported by other studies in the field, which show that “low-ability” students performed better in “heterogeneous” settings, where they learn math with students of differing abilities, than when they were placed in a tracked group. Middle- and high-performing students performed equally as well in both environments.

The question for Boaler, then, centers on who usually gets put in lower tracks. “There is evidence that tracking results in severe racial stratification,” Boaler wrote in an e-mail. “Students of color, with the

same achievement, end up in lower track classes.” Underrepresented students in science and math fields, Boaler and her C.M.F. co-authors write, “experience significantly more academic barriers (lack of academic exposure) in middle grades and below, and these barriers are negatively associated with math achievement in high school.” In addition to suggesting de-tracked math offerings, the draft framework also proposes to incorporate social-justice lessons into math, and to orient lessons toward seeing how math could advance social justice.

Predictably, the social-justice element fuelled a lot of the outrage around the C.M.F. Brian Lindaman, a professor at California State University, Chico, who chaired the committee of experts, academics, and former math teachers who wrote the C.M.F., said the creators of the framework were “asked in the guidelines to address equity.” He described this to me as a “challenge,” because of the ways in which it would almost automatically be seen as a political statement.

Lindaman did not exactly welcome the controversy—he told me he was a bit taken aback by its ferocity—but he is a true believer in the equity ethos. For him, it comes down to figuring out how Black, Latino, and other children who are underrepresented in STEM fields can start to think of themselves as “math people.” “What we would hope to see is that students find the joy and the beauty of math early,” Lindaman said. “Many of them do, it’s just that somewhere along the line that gets taken out and they stop seeing the beauty in mathematics. And we think that has something to do with the way it gets taught.” Lindaman also acknowledged that the framework’s emphasis on problem-solving questions and math scenarios rooted in social-justice concerns was “controversial,” but he defended it by stressing the importance of children seeing real-world applications of what they were doing, in a way that made sense to them.

A lot of this isn't worth arguing over. The claim that pedagogy should incorporate examples from the daily lives of all kinds of students is a reasonable one. The idea that math instruction should aim to create as many math people as possible isn't what infuriates the parents of Palo Alto and Princeton. The problem is that the C.M.F., which, as noted before, was based on explicit instructions to address equity concerns, framed the problem in a much broader, almost philosophical way. It's a credit to the authors that they don't treat STEM subjects as hard, objective endeavors that separate exceptional children from their competitors, but rather as lifelong pursuits that should include as many different types of people as possible.

You can agree with, or even commend, the C.M.F. authors for their intentions, and still point out that they have manufactured a kind of racial essentialism—one that assumes that Black and Latino students will naturally gravitate toward word problems about minimum wages, policing, or systemic racism. Perhaps more important, it's unclear if the low-income Black and Latino families purportedly being helped by these recommendations actually believe that this is the best path to help their children learn.

There is a propensity among progressives, particularly those working in education policy like Lindaman and Boaler, to minimize the effects or scope of their programs, or to ground their defenses—as Lindaman has done—in broader appeals to equality and unimpeachable statements like “we need more math people, period.” This is understandable, given how much school politics have been dictated by backlash to big progressive policies. But this strategy also invites what I have previously called binary consensus building, where one side says that if you do not agree with their specific programs, you must have opposing intentions as well.

This dynamic, in which critics often get labelled as racists, creates a muddled, sometimes inverted vision of who actually has power. Lindaman, Boaler and their co-authors were not running an experimental classroom or a seminar for a small group of teachers; they were providing the framework for how math would be taught in the most populous state in the country. While there is no mandate for local school districts to follow the framework's guidelines, what likely will emerge from their work is a state where wealthy suburban districts like Palo Alto will offer advanced math, and big city districts and some rural areas will not. The math wars do have consequences for millions of children.

What's always struck me about these fights is that reform, whether the California Mathematics Framework or Kilpatrick's vision of utilitarian math, always seems so radical and discomfoting. How is there so much room between methods; how have educators not settled on some foundation of best practices? It seems, at times, like nobody actually knows much of anything about how to make kids get better at numbers. In my next column, I'll be writing about why it's so difficult to figure out how to teach math and a new billion-dollar push to improve curriculum and classroom materials—one that hopes to disentangle itself from the politics of the math wars. ♦

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