I entered college around 1960 in a golden era for the mathematics major. At that time, 5 percent of freshmen expressed an interest in becoming math majors (although only half as many earned math degrees). Math grads were in demand for new careers in aerospace and other technological industries, along with traditional careers in insurance and teaching. Many of my math major friends planned to go to medical or law school, as well as graduate school in mathematics or other quantitative disciplines. For many smart freshmen with unsure career plans, mathematics was a default major. This piece sketches my reading of why the math major changed, along with an argument for why it needs to be revitalized.

Most United States universities in the 1950s had many tenured non-Ph.D. faculty in mathematics, and many offered a dated mathematics curriculum, e.g., a typical junior math course was tensor calculus. A dramatic increase in the number of math Ph.D.s was needed both to upgrade the quality of faculty and to match the rapid growth of college enrollments. The mathematics major curriculum required a massive revision to reverse the high failure rate in first-year graduate courses in Lebesgue integration and such. The proposed solution appeared in Pregraduate Preparation for Research Mathematicians (1963), the first report of the MAA’s new Committee on the Undergraduate Mathematics Major.
MAY of the Princeton administration watched helplessly bors get lured away, while my father and the rest of our faculty neighbors and little undergraduate teaching. I remember the winning strategy of offering reduced teaching loads and low-level mathematics enrollments at the Ivy League schools to Berkeley, Kerr hit upon Clark Kerr. In seeking to recruit star faculty from the Princeton Mathematics Department around 1960. His view of academic life was that he was paid to teach but given the free time to do research, which he loved. That was a time when universities had modest graduate programs and the focus was on undergraduate teaching. He believed that one person could be responsible for reorienting university administration toward graduate students and research—Clark Kerr. In seeking to recruit star faculty from the Ivy League schools to Berkeley, Kerr hit upon the winning strategy of offering reduced teaching loads and little undergraduate teaching. I remember seeing one after another of our faculty neighbors get lured away, while my father and the rest of the Princeton administration watched helplessly as they stuck to their two-courses-per-semester, undergraduate-focused tradition. Other public universities followed the Berkeley example, and finally the Ivies gave in. Soon all faculty at universities wanted to be treated like stars with reduced teaching loads. A huge increase in precalculus and other low-level mathematics enrollments at public universities, along with the pressure to get research grants, has further diminished the attention given to math majors over the past forty years.

I believe that research mathematics departments will have trouble flourishing, especially at public universities, without flourishing math majors. This was a key message in the 1999 AMS Towards Excellence report, which cited examples of several universities with flourishing math majors. As one model, in the programs cited at UCLA and Chicago, research faculty collaborate with nonresearch faculty or mathematically trained advisors to give math majors personal attention.

Mathematics departments cannot compete with the natural sciences for resources in research dollars. Because regular faculty do limited teaching in calculus-and-below courses, which represent over 80 percent of math enrollments, mathematics departments cannot count on the huge enrollments in these courses to justify their size. Indeed, administrators are increasingly using four-course-per-semester lecturers, adjuncts, and technology to provide cheaper instruction than graduate students and instructors—and they often do a better job; in the process, math teaching assistantships and faculty lines are eliminated.

Without meaning to diminish the importance of research mathematics, I believe that a broad-based, thriving major in a core discipline such as mathematics is valued and respected by administrators as an important university service to society and its economic well-being. The value of studying mathematics is perhaps more in its mental training than its content. The wide-ranging accomplishments of math majors speak for themselves: from economist John Maynard Keynes to biologist Eric Lander, who led the Human Genome Initiative, to Jim Simons, professor turned hedge fund guru turned philanthropist, and even to basketball star Michael Jordan.

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