An Invisible Minority: Asian Americans in Mathematics

Sharad Goel

There is an obvious dearth in the number of African Americans, Latinos, and Native Americans in the mathematical sciences. It seems incongruous, however, to describe Asian Americans as an invisible minority in mathematics. Asians—foreign and American—earned about half of the doctorates in statistics awarded by American universities in the last five years. For doctorates in mathematics, this proportion drops to about a quarter, substantially less but hardly characteristic of an "invisible minority". Among U.S. citizens and permanent residents, Asian Americans received less than 8% of mathematics Ph.D.'s during that same time period. Although this figure may seem surprisingly low, it is nearly double the proportion of Asian Americans in the U.S. population. Moreover, Asian Americans on average earn more and attend college and graduate school at higher rates than white Americans. By many measures Asian Americans are the most successful ethnic group in the United States, and relative to their proportion in the population, Asian Americans are overrepresented in mathematics.

Now take a closer look at the numbers. In 2004 only thirty Asian Americans received doctorates in mathematics.[1] With over 170 graduate mathematics programs, Asian Americans are aptly described as invisible in most schools. Among the top fifty research universities, ten mathematics departments had at most one Asian faculty member.[2] These numbers seem increasingly inadequate when one considers the tremendous diversity within the Asian American community itself. The socioeconomic disparity between Asian American ethnic groups, for example, is staggering: 64% of Asian Indians have college degrees, more than twice the attainment level of whites; of the combined Cambodian, Hmong, and Laotian population, only 9% have college degrees, comparable to the rates for African Americans, Latinos, and Native Americans.[3] Notwithstanding certain economic successes, Asian Americans continue to encounter racial discrimination: The Department of Housing and Urban Development found that "Asian and Pacific Islander homebuyers experience consistent adverse treatment 20.4 percent of the time…. This level of discrimination is comparable to the level experienced by African American homebuyers, and significantly higher than the level of discrimination against Hispanics."[4] Furthermore, views of Asian Americans as "perpetual foreigners" persist: A 2001 national survey reported that 23% of Americans would be

Sharad Goel is assistant professor of mathematics at the University of Southern California. His email address is `sharadg@usc.edu`*.*

[1] *Statistics compiled and released upon request to Colleen Rose, AMS Survey Analyst.*

[2] *Donna Nelson, "Faculty Diversity in Mathematics Departments at the 'Top Fifty' Research Universities",* AWIS Magazine, *Volume 31, Number 3, Summer 2002, pages 42–46.*

[3] *United States Census 2000, Summary File 4 (SF 4), Sample Data.*

[4] *Department of Housing and Urban Development,* Discrimination in Metropolitan Housing Markets: Phase 2–Asians and Pacific Islanders, *March 2003.*

uncomfortable voting for an Asian American to be president of the United States.[5]

A diverse student body and workforce consistently are seen to further the goals of universities. The National Academies jointly released a statement on affirmative action endorsing the position that "racial diversity is a compelling educational interest that is fundamentally compatible with the social and economic mission of institutions of higher learning."[6]

Diversity promotes the robust exchange of ideas, enhances cross-racial understanding, breaks down stereotypes, and prepares individuals for increasingly diverse workplaces. Many mathematics departments lack the meaningful numbers of Asian American graduate students and faculty necessary to achieve these benefits of racial and ethnic diversity. I propose three strategies to address this concern: 1) include the issue of Asian Americans in dialogues on diversity; 2) maintain and report detailed information on the representation of Asian Americans in mathematics, specifically differentiating between principal Asian ethnic groups; and 3) during the admittance and hiring process, consider the role of Asian Americans in attaining a diverse educational environment.

These recommendations should not, and need not, work against ongoing efforts to increase the numbers of African Americans, Hispanics, Native Americans, and women in mathematics. In comparison to these groups, Asian Americans as a whole have done well. It is false to argue that diversity can be extended along only one line at a time. To the contrary, policies that include Asian Americans promulgate a vision of diversity that benefits the entire mathematics community.

The Numbers. Table 1 records the number of Asian Americans who received doctorates in mathematics in the last five years. My experience has been that there is a consistent tendency within the mathematical community to overestimate these numbers. One explanation for this phenomenon is the conflation of *Asian American* (U.S. citizen or permanent resident of Asian descent) with *Asian* (any person of Asian descent, including students who immigrated to the United States for graduate school). The data support the perception that Asians, as opposed to Asian Americans, are represented in large numbers in mathematics. Table 2 lists the data for mathematics Ph.D. recipients without regard to resident status. In 2004, for example, 182 Ph.D. recipients were Asian, but only

30 of these students—less than one-sixth—were Asian American. Nearly a quarter of mathematics Ph.D. recipients in the last five years were Asian. However, over the same time period, only about 4% were Asian American. The proportion of Asian American graduates among American graduates rises to about 8% since approximately half of the graduates were American. Even if one argues that 8% is nearly double the proportion of Asian Americans in the U.S. population, the figure hardly supports the perception that Asian Americans are ubiquitous in graduate mathematics programs. Quite to the contrary, only 147 Asian Americans received mathematics Ph.D.'s during the five-year period between 2000 and 2004—fewer than the number of departments.

Table 1: Number of American recipients of mathematics Ph.D.'s by group.[7]

Year	Institutions Reporting	Asian Americans	Americans
2004	173 of 177	30	366
2003	172 of 177	19	341
2002	174 of 178	21	335
2001	174 of 178	33	417
2000	171 of 178	44	432
Total, 2000–2004		**147**	**1891**

Table 2: Number of recipients of mathematics Ph.D.'s by group.[8]

Year	Institutions Reporting	Asians	Total
2004	173 of 177	182	712
2003	172 of 177	151	679
2002	174 of 178	154	647
2001	174 of 178	171	704
2000	171 of 178	189	766
Total, 2000–2004		**847**	**3508**

When trying to build and maintain diverse institutions, it is imperative to recognize Asian Americans as a distinct subgroup of the Asian population. As opposed to recent Asian immigrants, Asian Americans share with other American minorities the experience of growing up in the United States as a visibly distinct group from the majority, white population. Like African Americans, Latinos, and

---

[5] *Committee of 100,* American Attitudes toward Chinese Americans & Asian Americans, *May 2001.*

[6] *Bruce Alberts (president, National Academy of Sciences), William A. Wulf (president, National Academy of Engineering) and Harvey Fineberg (president, Institute of Medicine),* Statement on Affirmative Action, *April 2003.*

[7] *Statistics compiled and released upon request to Colleen Rose, AMS Survey Analyst.*

[8] *Ibid.*

Native Americans, Asian Americans are thus particularly alert to issues of diversity and race. Moreover, Asian Americans and recent immigrants are culturally unalike, and often have dissimilar educational training and professional aspirations. Although both groups certainly enhance the diversity of a department, they do so in different ways. In particular, Asian Americans and recent immigrants will undoubtedly differ in their perspectives on race in America.

Tables 1 and 2 include data only from departments of mathematics (AMS Groups I-III), and in particular exclude data from departments of statistics, biostatistics, and biometrics (AMS Group IV). This division seems reasonable since, in my experience, statistics and mathematics departments tend to have limited interaction. Furthermore, the representation of Asians in these two fields is significantly different so as to warrant separate analysis. Indeed, between 2000 and 2004, Asians earned about 45% of Group IV Ph.D.'s, and Asian Americans earned about 15% of the degrees that went to Americans.[9] The Group IV figures for both Asians and Asian Americans are about twice as large as the corresponding numbers for mathematics departments (Groups I-III). The differences among Groups I, II, and III are not as pronounced. In all three groups, Asians constituted about a quarter of the graduates over the last five years. Of American graduates, Asian Americans represented 8.7%, 7.6%, and 5.7% of Ph.D. recipients from Groups I, II, and III, respectively; there was significant year-to-year variability within each group. Only one Asian American received a doctorate from a Group III institution in 2004.

The representation of Asians among mathematical faculty is slim. Only 11% of mathematics professors in the top fifty research departments are Asian, including both Asian Americans who were raised in the United States and those who immigrated as adults.[10] Seven of these top fifty departments have only one Asian faculty member and three departments have none. Again, one can argue that 11% is nearly triple the proportion of Asians in the U.S. population, but it is difficult to believe that one Asian faculty member constitutes the meaningful number of Asian Americans necessary to build and maintain a racially and ethnically diverse institution.

Asian Americans are even less visible in the highest ranks of academia. Asian Americans fill approximately 2.4% of higher education senior administrative positions and hold only fifty-seven, or less than 1.5%, of nearly 4,000 college and university presidencies.[11]

Perceptions and Misconceptions of Asian Americans. Despite a degree of economic success, Asian Americans continue to face significant racial discrimination. Asian Americans are, for example, widely perceived as "perpetual foreigners". A 2001 national survey found that 23% of Americans would be uncomfortable voting for an Asian American to be president of the United States; this compares to 15% and 14% for African American and female candidates, respectively.[12] The same survey found that 24% of Americans would disapprove if a family member married an Asian American, comparable to the percentage who would disapprove of a Hispanic spouse (21%) and lower than the percentage who would disapprove of an African American spouse (34%). Furthermore, the survey concluded that 17% of Americans would be upset if a "substantial number" of Asian Americans moved into their neighborhood, similar to the percentage that would be upset by an influx of African Americans (19%) or Hispanics (21%).

Asian Americans are characterized as the "model-minority", with traits including industriousness, perseverance, intelligence, and docility. The *Cornell Daily Sun*, the university's student paper, recently printed a comic that satirized Asians as "over-achieving, curve-busting" robots.[13] The author subsequently apologized, admitting that

> *Many graduate mathematics programs lack the meaningful numbers of Asian American doctoral students and faculty necessary to achieve the benefits of racial and ethnic diversity.*

[9] *Ibid.*

[10] *Donna Nelson, "Faculty diversity in mathematics departments at the 'Top Fifty' research universities", AWIS Magazine, Volume 31, Number 3, Summer 2002, pages 42–46.*

[11] *American Council of Education, Minorities in Higher Education, Twenty-First Annual Status Report, 2003–2004, February 2005, pages 97–98.*

[12] *Committee of 100, American Attitudes toward Chinese Americans & Asian Americans, May 2001.*

[13] *Stephen Davis, "The adventures of antman", The Cornell Daily Sun, March 11, 2005.*

the cartoon was insensitive, adding, "I had previously assumed that making a lighthearted reference to the popular conception of strong Asian work ethic would be harmless, if not complimentary." Although these traits may seem innocuous or even flattering, they contribute to a warped and damaging perception of Asian Americans. In particular, these attitudes minimize the achievements of individual Asian Americans who validate the stereotypes, and pressure Asian students who fail to meet the expectations. Furthermore, the idea of Asian Americans as the model-minority is a not so subtle jab at African Americans, Hispanics, and Native Americans, who by contrast are viewed as "problem" groups. The editorial staff of the *Sun* stood by their decision to publish the cartoon despite a student rally protesting the comic. It is hard to imagine they would have backed a caricature of African Americans as "basketball machines" or Jews as "accomplished bankers".

The model-minority stereotype reinforces the misconception of Asian Americans as a homogeneous, problem-free group and masks the considerable cultural and socioeconomic diversity within the Asian American community. Fourteen Asian ethnic groups have a large presence in the United States: Chinese, Filipino, Asian Indian, Korean, Vietnamese, Japanese, Cambodian, Pakistani, Laotian, Hmong, Thai, Taiwanese, Indonesian, and Bangladeshi.[14] These ethnic groups have markedly different demographic profiles as measured, for example, by median income, college degree attainment, and home ownership. By and large, Asian Indians as a group have done well economically. On the other hand, Cambodians, Hmong, Laotians, and, to a lesser extent, Vietnamese, on average have not seen those successes. Furthermore, it appears, at least anecdotally, that few Asian ethnic groups are represented in American mathematics departments.

The Department of Housing and Urban Development (HUD) found that "Asians and Pacific Islanders face significant levels of discrimination when they search for housing in large metropolitan areas nationwide."[15] Their results are based on paired tests, in which two individuals—one minority and the other white—pose as otherwise identical homeseekers and visit real estate or rental agents to inquire about the availability of advertised housing. The report concluded that "Asian and Pacific Islander homebuyers experience consistent

adverse treatment 20.4 percent of the time, with systematic discrimination occurring in housing availability, inspections, financing assistance, and agent encouragement. This level of discrimination is comparable to the level experienced by African American homebuyers, and significantly higher than the level of discrimination against Hispanics."

At the extreme, perceptions of Asian Americans lead to violence. Perhaps the most notorious case is that of Vincent Chin, who in 1982 was beaten to death in Detroit by two white autoworkers angry about the loss of auto manufacturing jobs to Japan. Ironically, Chin was not Japanese but rather Chinese. In 2004, the FBI recorded 217 incidents of hate crime motivated by anti-Asian bias.[16] This figure is comparable (relative to population size) to the 475 incidents of hate crime due to anti-Hispanic bias and the eighty-three incidents due to anti-Native American bias reported that year. The number of hate crime incidents due to anti-African American bias is considerably larger: 2,731 in that single year. Hate crimes that are motivated principally by anti-Muslim or anti-Sikh bias often involve Asian American victims, but are not included in the figures above. The recent surge of violence toward Muslims and Sikhs prompted the U.S. Department of Justice to form an initiative to combat post-9/11 discrimination.

Counterarguments. There are two types of arguments for excluding Asian Americans in diversity policies: general disapproval of affirmative action programs for any minority group; and resistance to affirmative action in the particular case of Asian Americans, with endorsement of those efforts when applied to African Americans, Hispanics, and Native Americans. Regarding the first sort, I write only this: African Americans, Hispanics, and Native Americans together constitute about a quarter of the U.S. population but received less than 8% of mathematics Ph.D.'s that went to Americans in 2004.[17] Nearly every mathematics program in the country endorses affirmative action policies as an effective tool for addressing this critical education gap. The pertinent question is not whether universities should employ affirmative action policies, but rather how schools can enhance those efforts.

Regarding the second argument, I see two objections for extending affirmative action to Asian Americans: a concern that Asian Americans will drain resources away from other minority groups, and a conviction that the affirmative action doctrine simply does not apply to this relatively more successful minority group. The first concern can

---

[14] *United States Census 2000, Summary File 1 (SF 1), 100-Percent Data. These are the fourteen Asian ethnic groups whose total population in the U.S. exceeds 50,000, listed in order of population size.*

[15] *Department of Housing and Urban Development,* Discrimination in Metropolitan Housing Markets: Phase 2– Asians and Pacific Islanders*, March 2003.*

[16] *Federal Bureau of Investigation,* Hate Crime Statistics*, 2004.*

[17] *Statistics compiled and released upon request to Colleen Rose, AMS Survey Analyst.*

be alleviated by policies that explicitly aim to increase the total number of minorities in an institution, instead of including Asian Americans by excluding other minority groups. Given that minority students (including Asian Americans) constitute only about 15% of American mathematics Ph.D. recipients, it is reasonable to elevate the level of Asian American graduate students without adversely affecting the representation of African American, Hispanic, and Native American students.

Diversity policies that include Asian Americans are, I believe, consonant with the tenets of affirmative action. With regard to any minority group, there are at least two compelling rationales for diversity programs. First, race-conscious policies are useful tools to counteract the effects of past and current discrimination. Despite a plethora of evidence that documents the pervasiveness of racial bias, it is impossible to gauge the effects of discrimination on any given individual. Consequently, affirmative action provides a push in the right direction, a check on the cumulative effects of discrimination. By this rationale, affirmative action does not directly address the causes of bias, but rather focuses on mitigating the symptoms. Second, affirmative action facilitates the creation and maintenance of diverse institutions, a desirable end in and of itself. To wit, diverse institutions promote the robust exchange of ideas, enhance cross-racial understanding, break down stereotypes, and prepare individuals for heterogeneous workplaces. In front of the U.S. Supreme Court, the University of Michigan Law School "assert[ed] only one justification for their use of race in the admissions process: obtaining the educational benefits that flow from a diverse student body."[18] It is this second rationale that is particularly cogent in the case of Asian Americans: Many graduate mathematics programs lack the meaningful numbers of Asian American doctoral students and faculty necessary to achieve the benefits of racial and ethnic diversity. Diversity is essential, for example, to facilitate discussions of race in America, an issue that is central to every institution of higher learning during a time when students must be prepared to interact in an increasingly pluralistic society. Of particular importance in these discussions are the perspectives of groups that historically have faced discrimination—including Asian Americans.

Summary. Affirmative action programs are driven by an understanding that diverse institutions are necessary to address the needs and concerns of a heterogeneous society and acknowledge as essential the inclusion of groups that historically have faced discrimination. In contrast to recent Asian immigrants, Asian Americans share with other American minorities the experience of growing up in the United States as a visibly distinct group from the majority, white population. Bias against Asian Americans is evidenced by derogatory stereotypes, discriminatory housing practices, and incidents of hate crime. Many doctoral mathematics programs lack the meaningful numbers of Asian American graduate students and faculty necessary to achieve the benefits of racial and ethnic diversity. This situation is exacerbated by the tremendous diversity within the Asian American community itself, with substantial differences in socioeconomic well-being among Asian ethnic groups.

I suggest three courses of action: 1) include the issue of Asian Americans in dialogues on diversity; 2) maintain and report detailed information on the representation of Asian Americans in mathematics, specifically differentiating between principal Asian ethnic groups; and 3) during the admittance and hiring process, consider the role of Asian Americans in attaining a diverse educational environment. These strategies should not, and need not, work against ongoing efforts to increase the numbers of African Americans, Hispanics, Native Americans, and women in mathematics. Policies that include Asian Americans further a vision of diversity that benefits the entire mathematics community.

---

[18] *Grutter v. Bollinger, 539 U.S. 15 (2003).*