THE ROLE OF ETHNICITY IN CHOOSING AND LEAVING SCIENCE IN HIGHLY SELECTIVE INSTITUTIONS

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This study sought to assess the role of ethnicity in both initial choice of, and persistence in, science majors. Standardized test scores, high school records, initial concentration preference, college grades, and final majors of all the white, Asian, black, and Hispanic students who enrolled in 1988 at four highly selective institutions provided the database. Despite relative deficits in scores on measures of preparation and developed ability, blacks entered college with a strong interest in majoring in science. Black students interested in science also suffered the highest attrition from it; Asians were lowest, with whites and Hispanics near the average attrition of 40%. Ethnicity did not add significantly to ability and achievement variables in predicting attrition from science. The results are discussed in terms of two main issues: first, the effect of different standards of selection for the various groups on their success in science curricula; and second, the relevance of various well-known intervention strategies to the problems of minority attrition in science in highly selective institutions.

The question of why much larger proportions of non-Asian minorities leave the science pipeline than do whites or Asians has long concerned all persons and organizations interested in the vitality of science and in equality of opportunity to become a scientist. Science is a rewarding career for those inclined to pursue it, and many of the world's serious problems cannot be solved without science and technology. If large pools of potential scientists are being shut out by action of educational institutions themselves, that fact needs to be known, and the problem needs to be described and examined, so that effective ameliorative policies might be devised.

Our first reports (Strenta et al., 1993, 1994) concerned general issues about choice of, persistence in, and attrition from science, along with the way gender
affected those issues in our population. Here we will examine these questions with respect to ethnicity. Our strategy and goal is as it was with gender: to describe and analyze the predictors of initial interest in science, and then the predictors of persistence in science—that is, actually majoring in science—in terms of variables measuring intellectual achievement and developed ability.

The situation with respect to minorities differs from that for women very likely in several ways, but surely in one important respect: minorities are at least as interested in pursuing science as whites (Astin and Astin, 1993; National Science Board, 1993; White, 1992), and the attitude toward science, at least for African Americans, is very positive—more positive, other things being equal, than that of whites (Dunteman, Wisenbaker, and Taylor, 1979; see also citations in Oakes, 1990). In large unselected samples of college-bound students, just about a fifth of the whites, blacks, and Hispanics taking the SAT or filling out a student information form in their first college term intended to major in science or engineering (College Board, 1988a, or any recent year; National Science Board, 1993), with whites being slightly lower in rate of interest than blacks or Hispanics; over a third of Asians intended to major in science. In the somewhat more selective longitudinal sample reported by Astin and Astin (1993), the rates of initial interest were higher but in similar ethnic order: Asians, 53%; whites, 27%; Hispanics (Chicanos), 36%; and blacks, 34%.

Recent accounts (Oakes, 1990; Suter, 1993; White, 1992) of race, ethnicity, and science make it clear that non-Asian minorities are relatively low on most measures of preparation and developed ability, and that these deficits begin early in their schooling careers. They are considerable just before the point of entrance to college. Both the average SAT mathematics (SATM) scores and the math and science proficiencies of twelfth-grade blacks are about a standard deviation (S.D.) behind, and those of Hispanics are about .75 S.D. behind, those of whites (Suter, 1993). Thus, black grade 12 achievement in math is about the same as, and in science a little worse than, white grade 8 achievement. And while blacks and Hispanics are a little closer to whites on scores on College Board Achievement Tests and Advanced Placement (AP) tests, that is in part because very small and selected proportions of those minority groups take such tests (White, 1992).

Partly for these reasons, not many minority students actually enter science in higher education, and many who do drop out along the way. White (1992) and the National Science Board (1993) have reported that blacks received about 5.3% of the bachelor’s degrees in science in 1989 and 1991, though they constituted about 13% of the population and about 9% of the higher education enrollment; Hispanics, who were about 7% of the general population, and 5% of the higher education enrollment, had 4% of the science degrees. Asians (9%) and whites (82%) together had 91% of the science baccalaureates given in 1991, with Asians obviously greatly overrepresented.