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ABSTRACT

This study examined the impacts of faculty mentoring on student success and aspirations examining, first, whether characteristics or functions of mentoring relationships between faculty-mentors and student-proteges have any impact on academic achievement as measured by students' college grade point average and degree aspirations and, second, whether such benefits differ across gender and ethnic/racial lines. Three definitions of mentoring have been proposed: direct assistance, emotional and psychosocial support, and role modeling. The present study combined all three approaches and used data from the Cooperative Institutional Research Program, which involved a survey of freshmen in Fall, 1987 with follow-up in June, 1991. The sample provided data on 5,615 students from 172 institutions. Results indicated that: (1) many undergraduates lacked access to faculty mentoring (44 percent reported that no faculty had taken a personal interest in their progress); (2) there was a positive relationship between access to faculty mentoring and academic success though whether this was a causal relationship was unclear; and (3) the relationship of mentoring to academic achievement varied across gender and ethnic groups. For example, honest feedback about one's skills and abilities was a strong positive predictor of grade point average for white women, but not for white men or non-whites. Survey data are presented in chart form. (Contains 23 references.) (JLS)

Mentors and protégés: The influence of faculty mentoring on undergraduate academic achievement

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As access to higher education has increased for all Americans, our nation's colleges and universities are seeking new strategies for promoting academic success, particularly for nontraditional students and those from historically underrepresented groups, many of whom are under-prepared for college level studies. A large number of researchers have attempted to identify the factors which promote academic success. Although faculty contact has been shown to positively impact student grades, relatively little is known about the level and types of contact that are most beneficial. This paper explores the impacts of faculty mentoring, as one model of student-faculty contact, on student academic success and aspirations.

Mentoring has traditionally played a central role in American higher education and continues to be an important element of effective graduate training. At the undergraduate level, this tradition has been given somewhat less of an emphasis in recent decades but is increasingly being looked to as a strategy for improving the quality of undergraduate education. Many colleges have developed mentoring programs, and a growing literature recommends mentoring as an effective strategy for promoting undergraduate academic success (AASCU, 1985; Moore & Amey, 1988). Numerous studies (e.g., Johnson, 1989; Moses, 1989; Sedlacek, 1983; Ugbah & Williams, 1989) recommend mentoring relationships for women and students of color because of the belief that mentoring can help students succeed in environments experienced as alienating and hostile. Unfortunately, empirical research on mentoring in undergraduate education is scarce and primarily based on small, nonrepresentative samples of students, and in fact, Jacobi (1991) argues that most

authors simply assume mentoring is an effective strategy for developing quality undergraduate education.

Although some studies of populations outside higher education provide indirect support for the hypothesis that mentoring promotes academic success, few studies of college students have been conducted to directly test this hypothesis. This study is designed to develop an empirically-based understanding of the educational consequences of undergraduate mentoring based on data from students attending a national sample of colleges and universities.

A developmental conceptualization of the mentoring process informs the study. Developmental psychologists have argued that being mentored is an important experience for young adults that can have powerful, long-lasting positive effects on the lives of protégés (Carden, 1990). Of specific interest here is the influence of mentoring on the psychosocial development of students. More specifically, we seek to address the following questions in this study:

- Do characteristics or functions of mentoring relationships between faculty-mentors and student-protÈgÈs have any impact on academic achievements as measured by students' college grade point average and degree aspirations?
- If mentoring functions do indeed impact students' academic success and degree aspirations, do the benefits differ across gender and ethnic/racial lines?

What is mentoring?

The modern concept of mentoring can be traced to Homer's Greek classical myth, The Odyssey, in which Odysseus embarks upon his heroic sea adventure, leaving behind his family and worldly goods for many years. In Odysseus' absence, the advising and guidance of his son, Telemachus -- from boyhood into manhood -- is one of the primary duties entrusted to Athena, who, in his surrogate fathering role, becomes known to Telemachus as Mentor.

Despite the years that have elapsed since the writing of this ancient tale, the general notion of the role which modern-day mentors should serve has not changed much at all. One recent description reads in part:

> Mentors are guides. They lead us along the journey of our lives. We trust them because they have been there before. They embody our hopes, cast light on the way ahead, interpret arcane signs, warn us of lurking dangers, and point out unexpected delights along the way (Daloz cited in Merriam et al, 1987, p. 1987).

In practice, however, mentoring relationships take many different forms. In fact, Jacobi (1991) argues that the definitions and practices of mentoring relationships, even within the field of higher education, are so numerous and diverse that operationalizing the concept is problematic.

The literature provides conflicting definitions of the elements of mentoring relationships. For instance, some contend that a mentor is traditionally an older, wiser adviser (Daloz, 1987; Levinson et al, 1978), but others have found that a distinct age gap between mentors and protÈgÈs is not essential. Within higher education for example, student peer mentoring relationships are increasingly being implemented as a means to more smoothly acclimate new students to college life and the campus environment.

Among other points of conflict in defining and operationalizing mentoring, is the length of time necessary to fulfill a successful mentor-protégé relationship. On this issue, Jacobi (1991) cites a number of studies which claim that mentoring relationships can be as brief as a single encounter (Phillips-Jones, 1982); or, on the other hand, as long as 2-10 years (Levinson et al., 1978). The degree of intimacy and intensity in mentoring relationships; the importance of gender and ethnic similarity between the mentor and protégé; and formally assigned and structured mentor-protégé relationships versus those which are based upon informal mutual attraction are all additional points of unresolved conflict surrounding studies which assess the benefits and consequences of mentoring relationships.

Through a synthesis of the literature on mentoring from the fields of education, management, and psychology, Jacobi suggests that all mentoring-like student-faculty interactions fall under one or more of three broad categories:

1. direct assistance with career and professional development
2. emotional and psychosocial support
3. role modeling

This typology is derived from previous research on social support (e.g., Cobb, 1976) that demonstrates the positive effects of tangible and emotional support on individual well-being.

Within higher education, the direct assistance category is related to two theories: Astin's theory of involvement in learning (Astin, 1977, 1984). From this perspective, mentoring can be a means through which students become more involved in their own learning through supportive relationships between students and faculty, where the display of care and concern is conveyed to the student. This type of supportive exchange helps students to reduce stress in their own lives, while they are inspired simultaneously to increase their ability to cope with stress.

Tinto's theory of student academic and social integration (Tinto, 1975) contributes to the development of the category of emotional and psychosocial support. Jacobi (1991) asserts that these theories are suitably combined because Tinto's theory of integration is established upon students' attitudes and feelings about their college experience. The social and emotional support provided in nurturing, caring relationships between students and faculty could be the strongest link to integration for students, hence the best way to increase positive feelings about their college experience thereby leading to academic success.

The role modeling category as it emerges from Chickering's (1969) and Perry's (1970) theories of cognitive development. Such supportive student-faculty relationships are crucial in the development of students' intellectual competence and integrity, and may therefore be of greatest importance to overall student development.

These three categories are not mutually exclusive. Role-modeling activities, for example, may also offer direct assistance or emotional support. These categories do, however, offer a useful heuristic for describing and assessing mentoring.

In this study, we do not delude ourselves into thinking that we can achieve one common, all-embracing definition for student-faculty mentoring relationships in higher education when others have been unable to do so. Instead, we employ the three theoretical categories of mentoring functions listed above, as a means for organizing our many student-faculty interaction measures. By doing so, we hope to help identify general classes of variables that promote academic

achievement, while also looking at specific activities that can be of use to faculty and administrators interested in promoting such outcomes.

Table 1 provides a list of the variables selected from the dataset as appropriate student-faculty interaction measures which best describe mentoring. These measures were derived from Jacobi's classification scheme.

Methodology

In undertaking this study, we use data collected as part of the Cooperative Institutional Research Program (CIRP), a continuing program of research that is sponsored by the American Council on Education and the Higher Education Research Institute (HERI) at the University of California, Los Angeles. The CIRP freshman survey program annually collects a broad array of student background information using the Student Information Form (SIF; see Astin, Panos, & Creager, 1966), and is designed to longitudinally assess the impact of college on students. The data for this study are primarily drawn from the 1987 SIF administered to incoming students and the 1991 Follow–up Survey of 1987 Freshmen. In addition to these survey data, structural characteristics of the institutions attended by each respondent in our sample were added to the file using U.S. Dept. of Education IPEDS data.

Sample

The Student Information Form (SIF) was distributed to campuses in the Spring and Summer of 1987 for distribution to college freshmen during orientation programs and in the first few weeks of fall classes. As part of the 1987 freshman survey, the 289,875 students at 562 participating colleges and universities completed the SIF. To reduce the possibility of bias due to errors in survey coverage, survey respondents at 172 institutions were excluded from the SIF normative population because of a low rate of return from their college as a whole (usually below 75%). This left 209,627 students at 390 institutions in the national normative population (Dey, Astin, & Korn, 1991).

The Follow–up Survey (FUS), when linked with freshman SIF data, is designed to assess a wide–range of student experiences and undergraduate achievements and to provide a longitudinal database for studying how different college environments influence student development. A sample of 1987 SIF respondents in the normative population was drawn using a stratified, random sampling procedure designed to ensure an adequate representation of student respondents from different types of higher education institutions (HERI, 1992). The stratification scheme classified institutions by type and selectivity into one of 23 cells, a sample of students was drawn from institutions in the CIRP national norms (i.e., those institutions whose response rates to the freshman survey were judged representative of their entering freshman class). This sample size was selected based upon earlier Follow-up Survey response rates and was designed to yield a minimum of 175 respondents in each stratification cell.

The Follow-up Survey instrument was sent to students in June, 1991. A second wave of follow-up surveys was mailed to nonrespondents in mid-August, 1991. The response rate to the FUS averaging 20.7 percent in the random sample, giving us data on 5,615 student. While this rate of response is lower than one would like, it is about average for recent surveys of this type and can most probably be attributed to the continuing general decline in response rates to mail surveys caused by the increasing frequency of mass-mailing advertising campaigns (see Groves, 1989).

Nonresponse to follow-up questionnaires can present serious problems. It should be noted, however, that the FUS differs from other types of mail surveys in that a great deal is known about the characteristics of both respondents and nonrespondents. Using data collected on the SIF filled out four years earlier, it is possible to understand those student characteristics that are related to the likelihood of a student responding to the survey. Using this knowledge, adjustments for nonresponse can be made using a weighting procedure described in Astin and Molm (1971). In effect, this procedure generates weights that give the greatest weight to those respondents who most resemble nonrespondents. The analyses that follow were adjusted, therefore, to correct for response rate and should represent the results that would have been achieved if all students who were sent a follow-up survey returned it (Dey, 1995; HERI, 1992).

Measures and analysis

The 1991 FUS contained a series of 11 items designed specifically to capture selected aspects of the student-faculty mentoring process (Jacobi, 1991; Jacobi & Dey, 1992). Of these 11 items, 9 appeared in an item set which directly addressed whether or not the student had experienced certain types of mentoring, one item asked for the student's impression of faculty interest toward them, while the final item was phrased in terms of student satisfaction. These items are described in Table 2, and serve as the main independent variables of substantive interest in this study. We have also included 6 other measures of student-faculty interaction in our analyses since, as we note above, it is difficult to precisely distinguish between general student-faculty interaction and faculty mentoring of students.

In addition to analyzing the entire sample, we conducted separate analyses for four groups: White men, white women, nonwhite men, and nonwhite women. In each of the analyses the independent variables were entered in the prediction equation in a hierarchical fashion in which blocks were determined by the nature of the variables. These variables and the blocking scheme used in the regressions are shown in Table 4 (although it should be noted that the certain variables were necessarily deleted from the subgroup analyses as these variables become constants during separate group analyses).

The first block of variables used in the regression analysis are measures of student pre-college characteristics, and are designed to control for the non random distribution of students across different types of institutions. In addition to standard demographic characteristics (i.e., gender, race, parent's education and occupational prestige, family income), we have included several measures based on Astin's (1993) student typology. These variables represent different student orientations or traits, and are useful in summarizing dozens of SIF items that measure student predispositions related to a variety of goals and values. They are included in these analyses for we assume that certain predispositions -- such as having a scholarly orientation -- might lead

students to seek out mentoring opportunities relative to other students with different predispositions.

The structural characteristics of institutions make up the second block of regression variables, and include standard institutional characteristics of size, selectivity, type, and control. As before, these structural characteristics are included primarily as control variables to reduce any bias associated with student enrollment patterns, although we are particularly interested in the relationship between size and mentoring outcomes as larger institutions may make it difficult for students to find access to mentoring.

The third block of variables in the analysis represents the experiences students had during college. Although the follow-up survey contains numerous additional variables which might be included in such a blocking scheme, we have attempted to be selective in identifying such variables. In addition to developing a measure of the number of years a student was enrolled at his or her freshman college, we have used measures which represent the student's final undergraduate major as well as their undergraduate grade point average as we expect these factors to relate to a student's access to mentoring. We have also included a number of measures which capture the ways in which students reported spending their time during college. Of specific importance here are the measures related to the time students spent in academic pursuits. The final block of independent variables in the multivariate analysis consists of the mentoring and student-faculty interaction items.

Limitations

Several limitations must be remembered when interpreting the results presented below. From a methodological perspective, it is important to remember that although we have adjusted these results to compensate for patterns of non response it would have been preferable to have received actual responses from all of those originally surveyed (Dey, 1995). In addition to the problem of unit nonresponse, this data set includes patterns of missing data due to item nonresponse (i.e., not all students who completed a survey answered all questions).We have

addressed this problem in the multivariate analyses through mean substitution, an approach which is conservative in terms of its influence on regression coefficients.

A substantive limitation is found in the mentoring items themselves. As noted above, there continues to be a good deal of theoretical and practical confusion as to ways one might distinguish between mentoring and student-faculty interaction. Since our goal in this research is directed at other topics, we have not attempted to resolve this confusion and have used a standard approach in treating our self-defined mentoring and student-faculty interaction items. A related limitation is that we do not know which, if any, of our student respondents have participated in a formal mentoring program. It may be that 'natural' mentoring experiences lead to different outcomes than those which develop by design, and such differences will be missed in this analysis.

Results

Before examining the results of the multivariate analyses, it is important to examine the nature of the variables with which we are primarily interested. Table 2 shows the distribution of the items which we view as the primary measures of mentoring. Over one-half of the students (56.1 percent) say that they had faculty take a personal interest in their progress, while only about one-quarter (26.7 percent) said they were very satisfied with their ability to find a faculty or staff mentor. Thus, between half and three quarters of undergraduates have been unable to find mentoring during their undergraduate careers.

Students were most likely to obtain direct assistance related to the central function of higher education (advice and guidance, intellectual challenge and stimulation) and least likely to obtain less routinized forms of direct assistance (sponsorship for special programs, help cutting through campus 'red-tape'). Emotional support and role-modeling were reported at rates that fell between these two extremes.

College Grade Point Average

Results produced from statistical analyses for predictors of college GPA reveal that a number of variables outside of mentoring activities contribute to the variance in the regression equation. As one might expect, the strongest positive predictor of college GPA is high school GPA (ß = .32). Numerous studies (see Pascarella & Terenzini, 1991) and conventional wisdom support this finding that if a student is a high academic achiever in high school as represented through his or her grades, then there is a strong likelihood that a successful academic college career (grade wise) will follow. In addition to high school GPA, there are a number of other strong positive predictors of college GPA, including high self-ratings regarding academic self-concept (ß = .10) and hours spent on academic work (ß = .13).

Several of the student typology variables are also positive predictors of college GPA. They include students who are described as uncommitted in Astin's typology (ß = .05), students who view themselves as scholars (ß = .13), and students who view themselves as artists (ß = .06). These three student typologies all fit within the realm of a liberal arts student/scholar--one who enjoys reading and learning for the sake of it and is not necessarily on the fast track into a professional career. Studies show that such students of the liberal arts (especially those who study arts and humanities courses) often receive higher grades than those in natural sciences and some social sciences (Sabot & Wakeman-Linn, 1991). Majoring in health profession fields is another positive predictor of college GPA (ß = .06), even though it does not fit this liberal arts/higher grades theory. Perhaps these health profession majors are students in occupational therapy or other areas of allied health where grading may be more lenient, as opposed to some extremely competitive pre-medical or other hard-core science programs.

Attending a private institution is another positive predictor of college GPA (ß = .05). Such institutions are often smaller and tend to afford students much more individual attention in academic development where opportunities to receive higher grades are more prevalent than at larger public institutions. Finally, the most unanticipated and difficult to explain positive predictor of college GPA is hours per week spent commuting to college (ß = .06). One would think that

increased hours in commuting would detract from study time, hence, would negatively affect grades yet, the opposite appears to be the case here.

A number of variables negatively affect college GPA, most of which are consistent with past research. For instance, majoring in biological sciences (ß = -.04), engineering (ß = -.07), or other physical sciences (ß = -.04) are all strong negative predictors of college GPA. Increased time spent socializing (ß = -.08), on hobbies (ß = -.07), and working at a student job (ß = -.03) also negatively impact college GPA for what may be obvious reasons--less time for academic work. Students who view themselves as leaders also receive somewhat lower college GPAs (-.15). This too, may be due to spending too much time in leadership roles in college organizations and not enough time on academic work.

There are also two institutional variables which negatively impact college GPA. Attending an historically Black college or university (HBCU) yields lower college GPAs (ß = -.10), so too does attending a more selective institution (ß = -.09). HBCUs tend to cater mostly to student bodies that are often under-prepared for the rigors of college coursework, and higher GPAs are likely reserved until marked progress is demonstrated. Selective institutions, on the other hand, tend to attract and enroll very well prepared students, but often place less emphasis on grades and more on learning and knowledge attainment.

Among the mentoring variables, the strongest positive predictor of college GPA appears to be associated with the activity of a faculty member writing a letter to recommend a student for a job or graduate school (ß = .16). However, these results do not indicate the direction of causality: Are students more inclined to work harder for grades based on positive feedback they receive from faculty in letters of recommendation, or are faculty more likely to write letters for those students who receive higher grades? We speculate that a combination of the two explanations are at work here, with perhaps the latter being more prevalent.

Other strong positive predictors of college GPA are advice and guidance given by faculty regarding students' respective educational programs (ß = .05); faculty providing an environment of intellectual challenge and stimulation (ß = .10); faculty taking a personal interest in students and

their progress (ß = .09); faculty giving honest feedback about students' skills and abilities (ß = .05); and faculty having hosted students as guests in their homes (ß = .04). Such student-faculty interactions, we would argue, serve as the core of mentoring relationships between students and faculty. Again, the question must be raised as to whether the students who benefit from such mentoring activities are those with the higher grades to begin with. On the other hand, we argue that by providing a supportive and nurturing environment where college students are enabled to interact with faculty as suggested in the student-faculty interactions above, such activity can only enhance the quality of students' collegiate experiences and likely add to their academic achievement.

There is one student-faculty interaction variable, however, that does appear to have a negative influence on college students' GPA. That is the activity of having a faculty member provide tutorial assistance or help with improving students' study skills (ß = -.12). We conclude that it is not the tutorial activity in and of itself that leads to lower student GPAs, but rather the fact that students with lower grades are more likely to seek tutorial assistance and help with study skills from faculty.

Subgroup analyses. The results of the regression analyses designed to determine whether the college grade point average of white and nonwhite men and women are differently affected by various mentoring activities are shown in Table 4. An examination of the results indicates that, among the pre-college characteristic variables, high school grade point average was the strongest predictor of students' college grade point average for all groups. For whites, having a scholarly goal orientation was shown to be a very strong positive predictor of college grade point average, with men and women having regression coefficients of .14 and .12, respectively. The number of hours per week spent on academic work was a strong positive predictor of high college grade point average, while the number of hours per week spent on socializing was a strong negative predictor for all groups except nonwhite women. These findings support the notion that, for academic achievement to be realized in the form of high college grades, students must be willing to make significant temporal and psychological commitments to their course work.

Most importantly, analyses of the mentoring items revealed several patterns across groups. As noted in Table 4, finding a faculty member to write a letter of recommendation for a job or graduate school was the strongest positive predictor of college grade point average. In turn, they may be more inclined to interact with faculty on a consistent basis. Finding a faculty member to provide intellectual challenge and stimulation was a strong positive predictor for both white men (β = .06) and white women (β= .11) but not minorities. Conversely, finding a faculty member to provide tutorial assistance and help in study skills was shown to have a strong yet negative effect on whites. Again, we believe that the tutorial assistance itself does not adversely impact college grade point average, but instead the students with lower grade point averages are more inclined to seek academic assistance from faculty.

For men, finding faculty to take a personal interest in their progress proved to be a positive predictor (β for white men = .09; β for nonwhite men = .22). This may suggest that male students have easier access to establishing close relationships with faculty than do women, perhaps due to the fact that male professors significantly outnumber females in the academy. This could also be evidence of the "chilly climate" for women in higher education. Finding faculty to provide honest feedback about students' skills and abilities was a significant positive predictor of college grade point average for white women only (β= .11). Although we would argue that such interactions are key components of the mentoring relationship, it appears that their effect is not as important as once thought. It should be noted that while finding faculty to provide honest feedback was not found to be a statistically significant predictor of students' college grade point average, its effects were positive for most groups.

Degree Aspirations

Numerous background variables outside of the mentoring items yield a positive impact on student degree aspirations in the regression results. Quite naturally, if a student has high degree aspirations upon entering college, he or she is likely to maintain or increase such high standards throughout (unless the college experience is so negatively devastating). Accordingly, degree

aspirations upon entering college in 1987 shows a positive influence (ß = .15). Certain fields of study also exhibit a positive influence on degree aspirations, among them are biological sciences (ß = .09), history/political science (ß = .10), physical science (ß = .04), and social sciences in general (ß = .11). Not surprisingly, these are typical majors for students who aspire to careers in medicine, law, and as research scholars and teachers.

Other student activity or character variables which prove to positively influence degree aspirations are: viewing one's self as a student leader (ß = .07); increased time spent on academic work (ß = .07); high college GPAs (ß = .12); and reading for pleasure (ß = .05). All of these are positive student traits which expectedly coincide with students who have high degree aspirations for themselves.

Institutional type variables that exhibit positive influences on degree aspirations include attending a university--as opposed to a 2- or 4-year college--(ß = .08); attending very selective institutions (ß = .06); and attending an historically Black college or university (ß = .11). Although the former two findings may seem logical, this result for HBCUs may seem to contradict an earlier reported finding of HBCUs negatively impacting college GPA. One might ask why are grades lower at these institutions, but degree aspirations higher? The answer to this question may be found in the fact that Black students, in general, report higher degree aspirations when compared to whites (Astin, 1990). Consequently, it might be expected that colleges with predominantly Black student populations will have a strong positive influence on degree aspirations, as the results show.

A couple of unexpected variables were found to negatively impact degree aspirations. Attending college as a full-time student as opposed to part-time appears to be a negative predictor of degree aspirations (ß = -.07). Also, surprisingly, increased hours per week spent commuting also negatively influences degree aspirations (ß = -.05). These results are probably the most difficult to rationalize, especially in light of the fact that time spent commuting positively influences college GPA, but negatively influences degree aspirations.

There are a number of mentoring activities which appear to have a positive impact on developing students' degree aspirations. The strongest of them being the activity of having a faculty member write a letter of recommendation (ß = .08). As with the college GPA, it may very well be the case where faculty are simply more favorable towards those with greater degree aspirations anyway. Other positive predictors of mentoring activities which impact student degree aspirations are faculty providing an environment of intellectual challenge and stimulation (ß = .07); faculty taking a personal interest in students and their progress (ß = .04); students and faculty spending time together talking outside of class (ß = .05); and students having worked on a professor's research project (ß = .05). All of these types of interaction are viewed as critical activities in a mentoring relationship between faculty and students, and the results here seem to corroborate our belief of their positive influences.

The one negative student-faculty interaction on developing students' degree aspirations is when faculty provide honest feedback about students' skills and abilities (ß = -.05) . We suspect this activity has a negative impact because faculty, in this role, are encouraging students to be more realistic about their career options. For example, a professor may discourage a student from aspiring to obtain a medical degree when he or she is receiving low grades in math and science. Hence, degree aspirations may be lowered as a result of the professor's honest feedback.

Subgroup analyses. Unlike the analyses predicting college grade point average, no particular pre-college characteristic was found to be a strong predictor of degree aspirations in 1991 for all groups. However, degree aspirations at the beginning of college (1987) were a strong positive predictor for white men (β= .15). For male students, having a leadership goal orientation was a strong positive predictor of their degree aspirations in 1991. The effect was strongest for nonwhite men, (β= .23). These results seem to indicate that students having high degree aspirations are likely to have exhibited strong academic and leadership characteristics prior to college; they simply maintained this behavior upon entering college.

As shown in Table 4, the strongest positive predictor of students' degree aspirations in 1991 across all groups was undergraduate grade point average. Such findings suggest that those

students aspiring toward admission into graduate or professional school clearly understand the importance of maintaining good grades during college. With the exception of the social sciences, no other academic majors were found to be significant predictors of degree aspirations. Majoring in the social sciences was a particularly significant positive predictor for white men (β= .08) and nonwhite men (β= .24). The results could be attributed to the fact that, oftentimes, advanced degrees are required for careers in the social sciences. It is possible that students majoring in these fields may be very aware of this and as such, aspire to attend graduate school.

Examination of the mentoring items which serve as predictors of students' degree aspirations reveals some interesting findings. For nonwhite women, finding a faculty member to take personal interest in their progress was a strong positive predictor of degree aspirations in 1991 (β= .19); but finding a faculty member to provide advice and guidance about their educational program was a strong negative predictor (β=- .20). We suspect that these women may be more positively impacted by simply knowing that a faculty member is taking an active interest in them and in turn, may not necessarily need advice or guidance from this individual, unlike nonwhite men for whom this was a positive predictor of degree aspirations (β= .18). Working on a professor's research project was a strong positive predictor for white men (β= .07) and women (β= .08). Again, this may lend support to the hypothesis that students learn by becoming involved (Astin, 1985). Interestingly, the types of activities which are often viewed as critical components of the mentoring relationship, including faculty providing emotional support and encouragement; faculty serving as a role model; student and faculty spending time talking outside of class; having been a guest in a professor's home; and finding faculty to provide tutorial assistance, were found to be predominantly insignificant in predicting degree aspirations in 1991 for the groups under examination. With the exception of a few instances, these key mentoring items were only found to be significant predictors for white students (see Table 4). This seems to suggest the need for further study of mentoring activities so that these relationships can become helpful to all students.

Discussion and Implications

We set out in this study to determine whether mentoring has any impact on student academic achievement, and whether or not different groups of students tended to receive similar benefits from being mentored by their faculty members. These preliminary analyses support three key conclusions.

First, a substantial proportion of undergraduates lack access to faculty mentoring. Close to half (44 percent) reported that no faculty had taken a personal interest in their progress, and one third were neutral to dissatisfied with their ability to find a staff or faculty mentor. On the other hand, more than three quarters of students had received emotional support and encouragement from faculty, advice and guidance about their educational programs, a letter of recommendation, honest feedback about their skills and abilities, and intellectual challenge and stimulation. Thus, most students do report receiving at least some benefits from faculty contact.

Second, we observe a positive relationship between access to faculty mentoring and undergraduate academic success. In particular, students who have received advice and guidance about their educational programs, intellectual challenge and stimulation, letters of recommendation, or faculty interest in their educational progress have higher grade point averages than those who have not received such attention. Although these findings do demonstrate a relationship, they do not demonstrate causality. For example, it is possible that good grades invite mentoring rather than vice versa, and it is possible that some third factor such as social skill or assertiveness leads to both high grades and faculty mentoring. In controlling for high school and college grades, however, this analysis increases the likelihood that mentoring exercises a positive impact on achievement. It is most likely, perhaps, that mentoring and academic success have a reciprocal relationship to one another, such that students of promise are most likely to receive mentoring, which in turn promotes their academic achievement. Future research, then, might attempt to disentangle the direction of causality with particular attention to formal mentoring programs that match at-risk students with mentors.

The third noteworthy finding is that the relationship of mentoring to academic achievement varies across gender and ethnic groups. For example, faculty interest in a student's progress was strongly associated with grade point average for men, but showed only a weak association with grade point average for women, especially nonwhite women. Honest feedback about one's skills and abilities was a strong positive predictor of grade point average for white women, but not for white men or non-whites. Working on a professor's research project is positively associated with high degree aspirations for whites but not non-whites. We can only speculate about the causes of these differences. They may speak to the dynamics of cross-gender or cross-race compared to same-gender or same-race mentoring. They may derive from the different needs that students bring to college, or the different interpretations or attributions they make about their experiences and other's behavior toward them. They may derive from subtle differences in the types or intensity of assistance provided that cannot be provided in survey checklists. They do, however, indicate that caution must used in program and policy development. Observations of "what works" for traditional students may have only limited value as interventions for non-traditional students.

Given the lack of clear definitions and criteria for mentoring, one may question if the items examined here are in fact indicators of mentoring. For example, the questions do not capture information about the intensity or duration of students' relationships with faculty. This analysis does, however, suggest that activities related to direct assistance, emotional assistance, and role modeling does add to our ability to explain and predict students' achievement and aspirations.

These results also point to future research. Longitudinal research is needed to address issues regarding the direction of causality particularly for formal mentoring programs. Future research should also compare effects of same sex/race versus cross-sex/race mentoring. And analysis is needed to determine how other aspects of the mentoring relationship, including its longevity and intensity, relate to academic success. In offering preliminary support for the effectiveness of mentoring, we hope this study will stimulate additional attention to the conceptual underpinnings and empirical assessment of mentoring.

This study is a contribution to the empirical literature on mentoring which can help institutions to better understand student-faculty relationships and their impact on academic achievement. It is recommended that future studies in the area go even further to establish the academic benefits of mentoring relationships for undergraduate students, particularly women and students of color. Future research might even consider a series of time points with which to follow up on their sample in a more extensive longitudinal study. This will help to determine long-term benefits of mentoring relationships. Furthermore, more attention should be given to the student perspective on mentoring relationships with faculty, through the stories that they have to tell. Qualitative research where these points of view are the focus is definitely needed and in order.

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Table 1
Jacobi's categorization of mentoring functions

Direct assistance-with career and professional development

helps to promote involvement in learning (Astin,1977, 1984); and to provide necessary social support to help reduce stress and increase coping abilities (Cobb, 1976)

Variables:

Advice/guidance about educational program
Letter of recommedation for a job or graduate school
Tutorial assistance or help improving study skills
Intellectual challenge and stimulation
Sponsorship for special programs
Help cutting through 'red tape'
Honest feedback about skills and abilities

Emotional and psychosocial support

promotes students' integration based on positive feelings and attitudes regarding their educational experience (Tinto, 1975); and provides necessary social support to help reduce stress and increase coping abilities (Cobb, 1976)

Variables:

Since entering college: Had faculty take a personal interest in progress
Hours per week: Time spent talking with faculty outside of class
Faculty provided: Emotional support and encouragement

Role modeling

helps to promote social and cognitive development among students (Chickering, 1969)

Variables:

In last year at freshman college: Been guest in a professor's home
Satisfaction: Ability to find a faculty or staff mentor

Additional satisfaction measures

Satisfaction: Opportunity to discuss coursework outside of class with professors
Satisfaction: Amount of contact with faculty and administrators
Satisfaction: Ability to find a faculty or staff mentor

Table 2
Items used to measure student experiences related to mentoring

Mentoring items	Percentage of students reporting		
Since entering college, how many faculty have you found that will provide:	*None*	*One*	*More than one*
Advice and guidance about your educational program	5.5	16.5	78.0
Emotional support and encouragement	20.4	22.6	57.0
Sponsorship for special educational programs (e.g., study abroad, independent study, etc.)	44.5	21.7	33.8
A letter of recommendation for a job or graduate school	24.1	12.5	63.4
Help cutting through the 'red tape' at your college	34.8	23.6	41.5
Tutorial assistance or help improving your study skills	30.1	20.4	49.4
Honest feedback about your skills and abilities	11.8	19.0	69.2
Intellectual challenge and stimulation	7.8	14.1	78.1
A role model/someone to model yourself after	25.4	21.1	53.1
Since entering college have you:	*No*	*Yes*	
Had faculty take personal interest in your progress	43.9	56.1	
Level of satisfaction with:	*Neutral or dissatisfied*	*Satisfied*	*Very satisfied*
Ability to find a faculty or staff mentor	34.9	38.3	26.7

Table 3
Variables used in multiple regressions predicting GPA and degree aspirations in 1991

Block 1: Pre-college characteristics
High School GPA
Student gender
Student race (6 dichotomous measures)
Degree aspiration upon college entry (Four-point response scale; Associate or none, Bachelor's, Masters, Post-Masters)
Student goal orientations (based on Astin's [1993] typology):
Scholar, Activist, Hedonist, Leader, Status striver, Uncomitted
Family background
Mid-parent's educational level (average of mother's and father's educational level on a 6 point response scale)
Estimate of family's annual income (single item; 14 point response scale)
Parent's occupational prestige (highest of prestige ratings assigned to mother's and father's occupation)
Block 2: Institutional characteristics
Type (University = 2, four-year college = 1)
Control (Private = 2, public = 1)
Selectivity (based upon composite SAT score of entering freshman class)
Size (based upon undergraduate FTE)
Women's college (Yes = 2, No = 1)
Block 3: College experiences
Number of years enrolled at freshman college
College major (12 dichotomous measures)
Hours per week spent socializing (2 item scale, alpha = .6731)
Hours per week spent on academic activities (2 item scale, alpha = .7364)
Hours per week: Reading for pleasure (single item, 8 point response scale)
Hours per week: Exercising / sports (single item, 8 point response scale)
Hours per week: Using a personal computer (single item, 8 point response scale)
Hours per week: Working (for pay) (single item, 8 point response scale)
Hours per week: Clubs or groups (single item, 8 point response scale)
Hours per week: Watching TV (single item, 8 point response scale)
Hours per week: Commuting (single item, 8 point response scale)
Hours per week: Religious services / meetings (single item, 8 point response scale)
Hours per week: Hobbies (single item, 8 point response scale)
Block 4: Mentoring and other forms of student-faculty interaction
Mentoring measures (13 items; see Table 2)

Table 4
Results of regressions predicting college grade point average and degree aspirations

College grade point average	All students β	sig	White men β	sig	White women β	sig	Nonwhite men β	sig	Nonwhite women β	sig
Average high school grades	.32	***	.32	***	.36	***	.25	***	.32	***
Degree aspirations in 1987	.00		-.02		-.01		.05		.09	
Academic self-concept	.10	**	.10	*	-.06		.20		.16	
Student typology score: uncommitted	.05	***	.05	**	.03				.01	
Student typology score: striver	-.01		.01		-.06	*	.00		.01	
Student typology score: scholar	.13	***	.14	***	.12	***	-.13		.05	
Student typology score: leader	-.15	***	-.20	***	.04		-.25	*	-.16	
Student typology score: hedonist	.03	*	.01		.01		.03		.13	**
Student typology score: artist	.06	***	.07	***	-.01		.06		.12	**
Student typology score - activist	-.04	*	-.03		.00		-.14	*	-.14	**
Parent's occupational prestige	.02		.04		-.03		.21	**	.07	
Parent's estimated income	.00		-.01		-.03		-.13	**	.02	
Mid-parent's education	.02		.01		.03		.09		-.08	
Attended private institution	.05	**	.08	**	.02		-.05		.15	*
Attended a university (not college)	.01		.01		.02		.05		-.04	
Attended HBCU	-.10	***					-.16		-.07	
Attended women's college	.00				-.01				.05	
Institutional selectivity	-.09	***	-.10	***	-.04		-.15	**	-.08	
Total undergraduate fte	.00		.00		.00		.18	***	.18	*
Biological sciences	-.04	**	-.02		-.08	**	.01		-.06	
Business	.02		.03		.01		.11	**	.07	
Education	.03		-.01		.03		.03		.03	
Engineering	-.07	***	-.08	***	-.05	*	-.04		-.02	
English	.02		.02		.03		-.02		.07	
Fine arts	.01		.01		.01		-.13	**	-.06	
Health professional	.06	***	.00		.08	**	-.01		.14	*
History/political science	.02		.05	*	-.02		-.09	*	-.05	
Humanities	.02		.02		-.02		.11	**	.01	
Math or statistics	-.02		-.01		.00		-.01		-.01	
Physical sciences	-.04	**	-.04		-.05	*	.05		-.03	
Social sciences	.03	*	.01		.07	*	.04		.03	
Number of years enrolled	-.02		-.02		-.03		.09	*	-.07	

Hours/wk spent on acad work	.13 ***	.14 ***	.07 **	.19 ***	.03
Hours/wk spent on socializing	-.08 ***	-.08 ***	-.10 ***	.13 **	-.07
HPW: Clubs or groups	.00	-.03	.01	-.06	.02
HPW: Commuting	.06 ***	.05 *	.05	.10 *	.02
HPW: Exercising or sports	.03 *	.03	.06 *	-.07	.05
HPW: Hobbies	-.07 ***	-.05 *	-.02	-.06	-.16 **
HPW: Reading for pleasure	-.01	-.03	.01	-.02	.04
HPW: Religious services or meetings	.00	.00	-.02	.01	-.05
HPW: Using a personal computer	.03 *	.00	.04	.01	.12 *
HPW: Watching tv	-.02	.00	-.08 **	-.02	.06
HPW: Working (for pay)	-.03 **	-.05 *	-.05	.04	-.16 ***
Advice/guidance about eduational pgm	.05 ***	.05 *	.01	.00	-.04
Worked on professor's research project	.02	.01	.04	-.01	.06
Tutorial assistance/help in study skills	-.12 ***	-.11 ***	-.10 ***	-.13 *	-.08
Been guest in professor's home	.04 **	.03	.01	.08	.05
Intellectual challenge and stimulation	.10 ***	.06 **	.11 ***	.02	.39 ***
Fac took personal interest in progress	.09 ***	.09 ***	.06 *	.22 ***	-.02
Sponsorship for special programs	-.01	-.02	.04	.03	-.03
Role model	.01	.04 *	-.02	.07	-.13 *
Help cutting through "red tape"	.00	-.01	.03	.10	-.06
Talk with faculty outside class	-.03 *	-.01	-.04	.05	-.03
Letter of recommendation for job/grad	.16 ***	.15 ***	.10 **	.20 ***	.31 ***
Emotional support/encouragement	-.01	-.01	-.06 *	.05	.03
Honest feedback about abilities/skills	.05 **	.03	.11 ***	.00	-.01
Multiple r	.60	.58	.60	.74	.81
R square	.36	.34	.36	.55	.66
Adjusted r square	.35	.32	.33	.49	.61

Degree aspirations in 1991	All students β	sig	White men β	sig	White women β	sig	Nonwhite men β	sig	Nonwhite women β	sig
Degree aspirations in 1987	.15	***	.17	***	.15	***	.08		.09	
Average high school grades	.02		.00		-.04		-.01		.11	
Academic self-concept	.00		.02		.05		.06		-.11	
Student typology score: uncommitted	.03		.04		.03				-.11	*
Student typology score: striver	.01		.00		.06	*	-.18	*	-.09	
Student typology score: scholar	.05		.01		.05		.05		.15	
Student typology score: leader	.07	***	.09	***	-.04		.11		.23	***
Student typology score: hedonist	-.01		.00		.01		-.10	*	-.06	
Student typology score: artist	.02		.01		.03		.05		-.02	
Student typology score - activist	.00		-.03		.02		-.02		.04	
Parent's occupational prestige	.01		-.01		.10	***	.02		-.10	
Parent's estimated income	.00		.04		-.06	*	-.04		.04	
Mid-parent education	.03		-.03		.00		-.14	*	.04	
Attended private institution	.00		.03		.03		-.10		-.09	
Attended a university (not college)	.08	***	.07	**	.02		.13		.02	
Attended HBCU	.11	***					-.04		.07	
Institutional selectivity	.06	**	.06	*	.06		-.01		-.02	
Attended women's college	.02				.02				-.01	
Total undergraduate fte	-.07	**	-.02		-.01		-.05		-.19	
Biological sciences	.09	***	.09	***	.05		.09		.03	
Business	.00		-.06	**	.01		-.04		-.09	
Education	.03	*	.00		.08	**	.00		.10	
Engineering	-.01		-.03		-.02		.12	**	-.04	
English	.03		.02		.01		.11	**	.08	
Fine arts	-.04	*	-.01		-.09	**	.06		-.05	
Health professional	.02		.01		-.01		-.05		.07	
History/political science	.10	***	.08	**	.17	***	-.05		.11	*
Humanities	.00		.02		.05	*	-.03		-.08	
Math or statistics	.01		-.01		.00		.06		.05	
Physical sciences	.04	**	.04	*	.04		.18	***	-.09	*
Social sciences	.11	***	.08	***	.09	**	.24	***	.13	*
Average undergraduate grade	.12	***	.16	***	.09	**	.21	***	.18	**
Number of years enrolled	.02		.00		.02		-.06		.13	*
Hours/wk spent on acad work	.07	***	.09	***	.05		.10		.08	
Hours/wk spent on socializing	-.04	*	.00		-.04		-.02		.14	*
HPW: Clubs or groups	-.01		.02		.00		.07		-.11	

HPW: Commuting	-.05 ***	-.02	-.04	-.05	-.10
HPW: Exercising or sports	-.03	-.04	.05	-.02	-.03
HPW: Hobbies	.02	.00	.00	.03	.14 *
HPW: Reading for pleasure	.05 **	.04	.02	.12 *	-.04
HPW: Religious services or meetings	-.04 *	.02	-.07 *	.02	-.10
HPW: Using a personal computer	.00	.04 *	-.03	-.08	-.07
HPW: Watching tv	-.01	.03	-.02	-.13 *	-.11
HPW: Working (for pay)	.02	-.01	.06 *	-.09	.07
Advice/guidance about eduational pgm	-.01	.05	-.06	.18 **	-.20 **
Worked on professor's research project	.05 **	.07 ***	.08 **	-.05	.06
Tutorial assistance/help in study skills	.01	.00	.00	-.03	.05
Been guest in professor's home	.03	.00	.08 **	-.01	.07
Intellectual challenge and stimulation	.07 ***	.09 ***	.06 *	.01	.03
Fac took personal interest in progress	.04 *	-.04	.07 *	.07	.19 **
Sponsorship for special programs	.02	.00	.03	.05	-.03
Role model	.03	.02	.05	-.06	.02
Help cutting through "red tape"	-.04 *	-.02	-.05	-.03	.02
Talk with faculty outside class	.05 **	.01	.09 **	-.01	.00
Letter of recommendation for job/grad	.08 ***	.14 ***	.05	.03	-.09
Emotional support/encouragement	-.03	-.02	-.01	-.11	-.04
Honest feedback about abilities/skills	-.05	-.06	-.06	.07	-.08
Multiple r	.51	.54	.54	.70	.71
R square	.26	.29	.30	.49	.51
Adjusted r square	.25	.27	.26	.41	.42

Note: $p < .001$, ***; $p < .01$, **; $p < .05$ *.

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