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The Influence of Financial Aid on Academic Performance and Persistence in Medical School

By Bonnie Jones and Polly Moss

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The purpose of the study was to investigate the relationship of financial aid to the persistence and academic performance of financial aid recipients in a professional school. Receipt of aid did not correlate significantly with graduation rate or class rank. Therefore, financial aid provided capable students, who otherwise could not afford, it the opportunity to attend medical school.

Financial assistance programs have been acknowledged as useful agents for encouraging undergraduate enrollment, promoting access and choice to higher education and assisting with persistence to the baccalaureate. Although professional school students represent a small fraction of all aid recipients in higher education, their special needs must also be recognized because of the large per capita amount of aid they receive and the debts they incur. Legislators must be certain that the system ensures equal opportunity for all individuals to pursue their educational goals, including the pursuit of a professional degree. The financial aid community must provide the Administration and Congress evidence of the influence of financial aid on professional student performance and persistence if necessary enhancements for these students are to be made through future reauthorizations of the Higher Education Act. In addition, professional schools should be aware of any influence financial aid may have on performance and persistence to structure fair institutional packaging procedures, award policies, budgets, and counseling programs and to be able to respond to changing enrollment demographics.

The purpose of this study was to investigate the relationship of financial aid to the persistence and academic performance of financial aid recipients at a midwestern medical college. This study analyzed the graduation rate of aid recipients and non-aid recipients and looks at whether a relationship exists with participation in need-based and non-need-based programs. The relationship between academic performance and the variables of racial/ethnic status, gender, marital status and academic performance prior to medical school was studied along with whether financial aid alone or combined with the other variables influences academic performance.

The Literature

There have been studies of persistence in two-year colleges, four-year colleges, public institutions, private institutions, and studies indicating the relationship of persistence to receipt of financial aid, packaging, and award amounts. Although there have been studies tying financial aid to undergraduate persistence, retention, attrition and grade point average, there is a lack of research on professional school students (Herndon, 1984). In addition, there has been relatively little research

(Malaney, 1984) on graduate students and virtually no reported research on graduate student persistence. Yet, graduate student performance and persistence are important from a public policy perspective, because there are high returns to this education (St. John and Masten, 1988). The same can be said for professional school education.

Most national studies of persistence find that financial aid has a positive influence on undergraduate enrollment (Astin, 1975; Carroll, 1987; Terkla, 1985; St. John, 1989 and 1990; St. John, Kirshstein, and Noell, 1987). Several studies have concluded that most, if not all, forms of aid have positive effects on recipients (Astin, 1964, 1975; Astin and Cross, 1979; Iwai and Churchill, 1982; Odutola, 1982; Voorhees, 1985).

Methodology

The population for this study consisted of all 188 students who matriculated into the medical school's freshman class in fall of 1986 and 1987. Independent variables included demographic, academic, and financial aid information. Dependent variables included a measure of persistence (graduation) and medical school class rank. The sample was 56% male and 44% female. The racial/ethnic distribution of the students was 75% Caucasian, 21% Asian/Pacific Islander, 2% African American, and 2% Hispanic American. Only 14% of the students were married.

Information collected on student academic performance prior to entering medical school included undergraduate college grade-point averages and Medical College Admission Test (MCAT) scores.

Students were classified into three financial aid groups: no-aid, non-need aid, and need-based aid. No-aid students did not receive assistance from any financial aid program; there were 42 such students. Students who had received aid were categorized in need-based and non-need based aid groups. The non-need based aid category included 19 students who received aid but demonstration of need was not required. The non-need programs included Supplemental Loans, Alternative Loans, Health Professions Scholarships (military), National Health Service Corps, merit scholarships, and outside scholarships with unknown award criteria.

The average amount received by each non-need student was \$5,611 for his or her entire enrollment period with a total of \$106,617 for all 19 students. Students who received any type of need-based aid (and possibly also non-need aid) were classified as need-based aid students. There were 127 of these need-based aid students, who received an average of \$36,952 each for their medical school enrollment period for a total of \$4,692,893 in aid. Eligibility for need-based aid was determined through Congressional Methodology and/or uniform methodology. Need-based programs included Perkins Loans, Stafford Loans, Health Professions (HP) Student Loans, Health Education Assistance Loans (HEAL), Exceptional Financial Need (EFN) Scholarships, Financial Assistance for Disadvantaged Health Professions Students Stipend (FADHPS), and institutional scholarships and loans.

Turning to the dependent variables, persistence in medical school was measured by grouping students into the categories of graduated and withdrawn (or not graduated). Academic performance in medical school was measured using each student's overall class rank. At this

medical school class rank was calculated based on grades during the first three years. The senior year is an elective year, and school policy precludes the use of elective grades in determining class rank.

The researchers hypothesized that the persistence rates of aid recipients and non-recipients would not be significantly different. The rationale for this hypothesis is the fact that one of the purposes of aid is to assist financially needy students to graduate at a rate equal to students from families who can afford to pay for their college education.

Secondly, it was hypothesized that students' receipt of financial aid would correlate with academic performance. Anecdotal evidence suggested that when students experienced academic difficulty at this medical school, the academic review committee often heard stories of financial need. This study was an attempt to separate the influence of demographics and academic performance prior to medical school from financial need in predicting medical school academic performance as measured by class rank.

To describe the student sample, frequencies, means, and standard deviations were calculated. To determine if there were any demographic differences among the three aid categories (no-aid, no-need, need-based), chi square (χ^2) calculations were used. Chi square is a test of significance used to determine if the frequency of occurrence is significantly different between nominal variables, such as demographic groups. To determine academic differences among the three aid categories, analysis of variance (ANOVA) techniques were used on undergraduate college GPA and MCAT scores. ANOVA is a technique used when the variables are on a numerical continuum. Chi square (χ^2) calculations were also used to determine if there was a difference in the graduation rates among the three groups of students. To determine differences in overall medical school class rank, ANOVA techniques were used. Finally, to explain how much of the variability in academic performance could be explained by receipt of financial aid, multiple regressions (R) were run.

Results

Support was found for the first hypothesis that the persistence rates of aid and non-aid recipients would not be significantly different. However, there was a lack of support for the second hypothesis that receipt of financial aid would correlate with academic performance. Some demographic differences were found in the three aid groups, and possible explanations for these differences are offered.

Table 1 shows the percentage of students in each aid category by demographic variable: gender, racial/ethnic group, and marital status. The closer the percentages are to the percentage in each aid group for the total sample, the less likely that the demographic groups are significantly different.

Males and females were represented in similar proportions in each aid category (no-aid, no-need, need-based) as determined through chi square calculations which proved to be nonsignificant ($\chi^2 = 1.50$, $df = 2$, $p = .47$).

Chi square calculations were run comparing Asian American and Caucasian students only, because the small percentage of African Amer-

TABLE 1
Percentage Represented in Demographic Variables for
Each Aid Category

	No Aid	No-Need	Need-Based
Total Sample**	23%	10%	67%
Males	25	10	64
Females	18	10	72
African American	0	0	100
Asian American*	38	28	35
Caucasian*	18	6	76
Hispanic	25	0	75
Single*	25	11	63
Married*	4	4	93

*Significantly different representation in aid groups.

**Note: Row % total to 100% (approximately).

ican and Hispanic American students (4%). Asian students were over-represented in the no-aid and no-need categories and Caucasian students were over-represented in the need-based category ($\chi^2 = 26.93$, $df = 2$, $p < .01$). Perhaps the reason for these discrepancies is that the Asian American students tend to come from higher income professional families at this medical school. However, because family income information is not collected for students who do not apply for need-based aid, this explanation could not be further explored.

Married students, although they made up only 14% of the sample, were more likely to receive need-based aid than single students ($\chi^2 = 9.11$, $df = 2$, $p < .05$), because they were financially independent and typically had a larger student budget to support a spouse and children.

Table 2 displays a comparison of the academics across the three aid categories. The mean college grade-point average of students receiving need-based aid was somewhat lower (3.48 on a 4.0 scale) than students who received no-need aid (3.65) as shown by analysis of variance techniques to determine if significant differences in GPAs are present (ANOVA; $F = 3.18$, $df = 2$, 184 , $p < .05$). Because the predominant form of aid received in the no-need category was scholarship assistance based on academic achievement, it is not surprising that there was a significant difference in grade-point averages. It is interesting to note that the mean grade-point average of students in the no-aid category was 3.49, nearly the same as the need-based mean GPA of 3.48. However, no significant differences were found in MCAT Biology scores

TABLE 2
Academic Comparisons of Aid Categories

	No Aid	No-Need	Need-Based
Mean College GPA*	3.49	3.65	3.48
MCAT Biology Score	8.9	9.8	9.2
Graduation Rate	86%	89%	84%
Class Rank Percentile*	51st	68th	50th

*Significantly different representation in aid groups.

(ANOVA: $F = 1.65$, $df = 2$, 185 , $p = .19$). Graduation rates were also not significantly different across the three groups, ranging from 84 to 89% ($\chi^2 = .37$, $df = 2$, $p = .83$).

The first hypothesis that the persistence rates of aid recipients and non-recipients would not be significantly different was accepted based on nonsignificant chi square calculations ($\chi^2 = .37$, $df = 2$, $p = .83$). In other words, the graduation rate was approximately the same whether the student received no aid, received only non-need aid, or received any type of need-based aid.

However, testing the second hypothesis, that students' receipt of financial aid would correlate with academic performance, was not as straightforward. Results of the ANOVA between class rank and the aid category to which a student belonged (no aid, no-need, need-based) showed a significant difference between the class rank of students who received no-need aid and students who received need-based aid ($F = 3.06$, $df = 2$, 163 , $p < .05$). The no-need aid recipients as a group ranked in the 68th percentile, whereas the need-based aid recipients ranked in the 50th percentile. Recalling the significant difference in GPAs between the no-need students and the other two groups, it is logical to expect that their past performance in college would predict their future performance in medical school. They would be expected to perform better in medical school, having entered with higher academic credentials. This explanation is further evidenced by the fact that no-aid students were very close to the need-based students on class rank (51st percentile) as they were on GPA—both academic indicators.

To test this hypothesis further, multiple regressions (R) were computed as shown in Table 3. Students' prior academics, not their receipt of financial aid, correlated significantly with medical school class rank. Therefore, although it looked like receipt of certain types of aid predicted class rank, actually it was the college GPA that was the stronger predictor. The multiple regression included college GPA, MCAT Biology score, graduated/not graduated from medical school, and financial aid category (no-aid, no-need aid, need-based aid). Of these four variables, only the college GPA correlated significantly with medical school class rank. The amount of variance in class rank explained by these four variables in a forced multiple regression was 29.02%. By adding in the amount of aid students received as another factor in the regression equation, 29.07% of the variance was explained. This means that controlling for the other factors, the amount of aid students received accounted for only .05% of the variance in class rank. Therefore, it is

TABLE 3
Results of Forced Multiple Correlations Predicting Overall
Medical School Class Rank

Variance	Variables Forced into Multiple Correlation
29.02%	College GPA, MCAT-Biology Score, Aid Category, Graduated/Not Graduated
29.07%	All of the Above + Amount of Aid Received

not plausible that the amount of aid students received had a significant effect on their class rank in medical school.

Conclusions and Implications

The results of this study provide financial aid administrators, legislators, and educational policymakers with evidence that student aid provides financially needy students with a "playing field" that is level in comparison to students whose families can afford to pay for their education. Students receiving need-based and non-need-based aid are just as likely to graduate from medical school as students who receive no aid. Even further, the receipt or non-receipt of aid has no significant effect on student academic performance in professional school. At the professional school level, this study is supported by St. John (1991) who claims that student aid is effective in promoting equal opportunity. Legislators need to be aware of this. If students' financial needs are being met and they are secure in their financial knowledge and planning, they may compete successfully with their financially non-needy counterparts.

As Herndon (1984) states, financial aid recipients have a great interest in quantifying their chances of completing school. Financing a professional school education may involve incurring substantial student loan debt. The results of this study indicate that potential and current students who take out loans to finance their education should feel secure that they have as much chance of graduating as students who do not take out loans. Being financially needy does not seem to negatively influence educational performance. In light of debt incurred by medical students, this information may influence their decision to pursue a professional degree, their institutional choice, and possibly their motivation while enrolled.

The findings of this study should be communicated to institutional departments and constituencies beyond the financial aid office. Enrollment managers and admissions officers need the information to aid in student outreach and recruitment, to shape and refocus retention efforts, and to refine financing and enrollment strategies (St. John, 1991). The results of the study will also aid counselors and advisors who detect a student struggling with financial difficulties and advise the student to seek assistance from the financial aid office. Development offices, current and potential donors, and the public can be further motivated to support student aid knowing that their funds are making a difference to needy students. Along these lines, public relations offices need to promote the benefits of student aid to taxpayers who provide the funding for federal financial aid programs.

Recommendations for Further Study

Because this study was conducted with a sample of students at only one medical college, it must be replicated at other medical and professional schools to confirm the results by conducting a meta-analysis. In this time of fiscal concern for the federal deficit, financial aid officers must prove beyond anecdotal evidence that aid is distributed in ways that benefit individual students and society at large. Only by conducting more quantitative research can we as financial aid administrators offer solid support for requests made on behalf of our students.

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