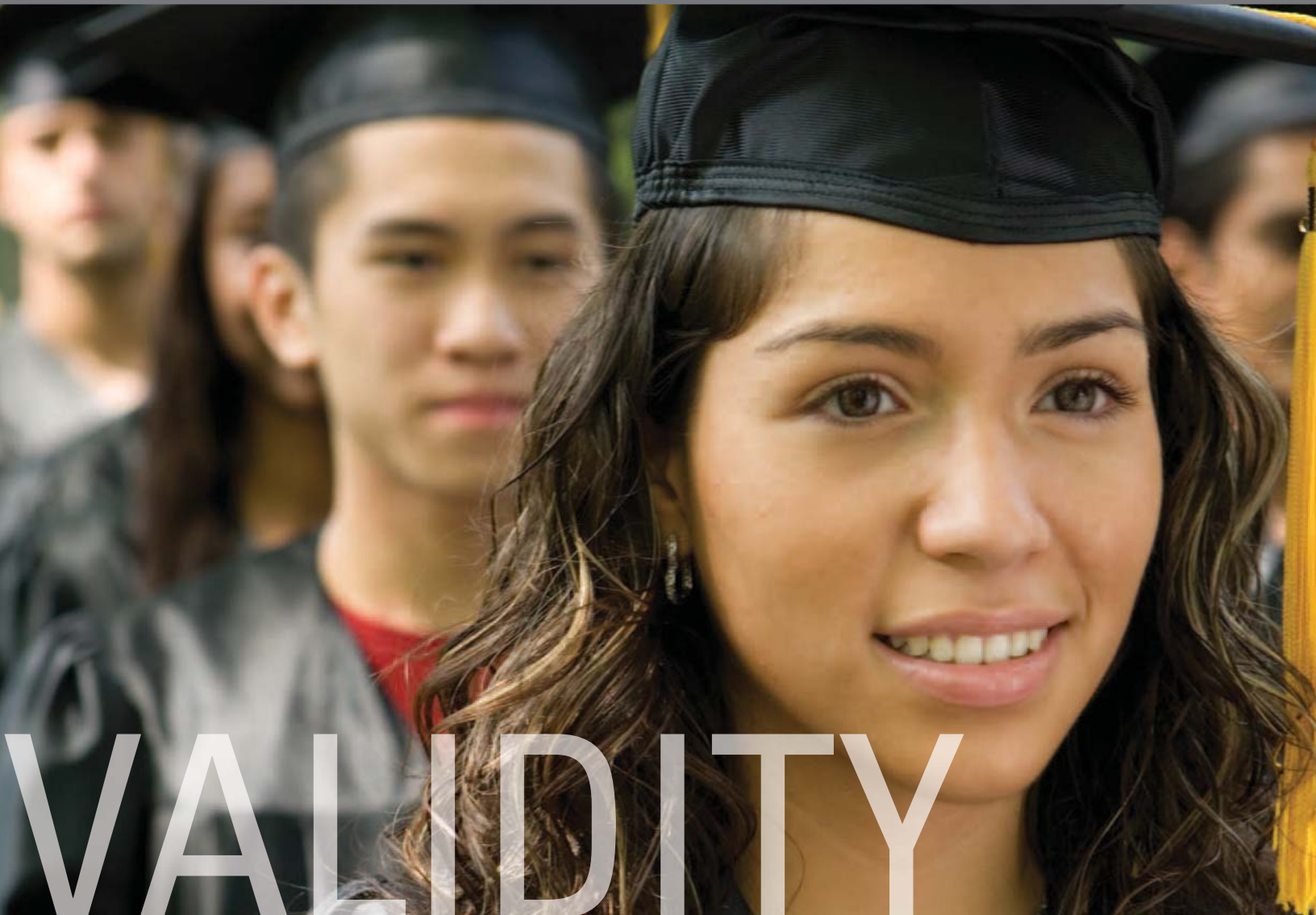CollegeBoard

Examination of College Performance by National Merit Scholarship Program Recognition Level

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Executive Summary

The current study examined the validity of the selection process used for the National Merit Scholarship Program (NMSP) to identify scholarship winners. Namely, this study examined whether students who advanced to higher NMSP recognition levels (Commended Students, Semifinalists, and various levels of award winners) had higher college performance, as indexed by first-year college grades and second-year retention rates. Based on a sample of nearly 400,000 college students, the results indicated that students who advance to higher NMSP recognition levels did earn higher FYGPAs and were more likely to return for their second year of college. In sum, these findings provide validity evidence in support of the NMSP selection process for identifying students who are most likely to succeed in college and deserving of a National Merit Scholarship.

Introduction

Established in 1955, National Merit Scholarship Corporation (NMSC) conducts two national scholarship competitions, the National Merit Scholarship Program (NMSP) and the National Achievement Scholarship Program (NASP). In general, both of these programs are rigorous academic competitions, but in keeping with the focus of the current study, the specific goals of the NMSP as stated in the *Guide to the National Merit Scholarship Program*, include the following:

- identify and honor academically talented U.S. high school students and encourage them to pursue rigorous college studies;
- provide professional services for corporations, company foundations, colleges and universities, and other organizations that wish to sponsor scholarships for outstanding participants in the competition;
- promote a broader and deeper respect for learning in general and for exceptionally talented individuals in particular;
- stimulate increased support for the education of scholastically able students; and
- encourage the pursuit of academic excellence at all levels of education.

NMSC selects approximately 50,000 students from the more than 1.5 million entrants to qualify for recognition in NMSC programs and compete for scholarships. Of these roughly 50,000 students, about 34,000 are selected to receive Letters of Commendation and about 16,000 are selected to qualify as Semifinalists in the NMSP.

The Preliminary SAT/National Merit Scholarship Qualifying Test (PSAT/NMSQT®), an assessment cosponsored by the College Board and NMSC, serves as the initial screening criteria for the two major scholarship programs for high school juniors. Only those students who attain a very high score on the PSAT/NMSQT will advance to the Semifinalist level in either program. Semifinalists must then meet multiple, additional requirements such as submitting a completed Semifinalist application with an essay, a recommendation letter, an endorsement from the high school, evidence of demonstrated leadership and extracurricular activity, evidence of good academic standing, and confirmation of PSAT/NMSQT performance with SAT® scores in order to progress to Finalist standing (McGuire, 2009). The scholarship recipients in the competitions are selected from the candidates in the Finalist pool.

As is the case with any selection process, "relevant evidence and a rationale in support of the intended test use" (AERA/APA/NCME, 1999, p. 11) should be furnished, and the NMSP is no exception. For example, a recent report by Marini, Mattern, and Shaw (2011) examined the relationship between PSAT/NMSQT scores and first-year college grade point average (FYGPA). It was shown that even among high-scoring students (i.e., students with PSAT/NMSQT scores of 200 and above), there were statistical differences in FYGPA, and that there was a linear, increasing relationship between PSAT/NMSQT scores and FYGPA. These findings indicate that students who perform higher on the PSAT/NMSQT also earn higher grades in college, thus lending validity to its use as a component of the overall scholarship selection process. Because the entire process for selecting the scholarship winners involves many different factors and not solely PSAT/NMSQT scores before final decisions are made, the current study will build on the research of Marini et al. (2011) by examining whether students who advanced to higher NMSP recognition levels (Commended Student, Semifinalists, and various levels of award winners) had stronger college performance as indexed by first-year college grades and second-year retention rates.

There has been some prior research examining whether National Merit Scholarship winners selected in high school do indeed perform better in college than those who were considered for, but were not ultimately awarded, the scholarship. Studies have compared National Merit Scholarship winners to Certificate of Merit recipients (Holland, 1959, 1960) on college freshman grades, academic achievement, personality measures, and vocational preference measures. A Certificate of Merit recipient refers to Finalists who did not win a National Merit Scholarship award. The results showed that the National Merit Scholarship winners tended to have higher GPAs than the certificate recipients, but that both groups performed well in college. These studies were somewhat inconclusive, however, because they relied on survey response data from the winners and response rates differed. In sum, it is important to assess the accuracy of the classification of National Merit Scholarship winners, which is the aim of the present study.

Current Study

The current study examines the college performance, measured by FYGPA and retention to the second-year of college, of students who achieved various levels of recognition in the NSMP compared to students who received no award. The main research question was whether the process used by the NMSP to identify scholarship award winners is valid in terms of subsequent college performance. In other words, do those selected as scholarship winners in high school perform better in college than those not selected as scholarship winners? It is important to examine the validity of a scholarship selection procedure, such as the NMSP, because winning a National Merit Scholarship is not only associated with prestige but also helps to alleviate the financial burden of college costs. Due to the fact that this is a merit-based scholarship, it is imperative that the most academically deserving students — those who are most likely to succeed in college — are chosen as winners. This would provide credibility and empirical evidence in support of the scholarship selection process that is in place.

Method
Sample

The sample examined included three cohorts of first-time, first-year students entering college in the fall of 2006, 2007, or 2008, which constituted 654,717 students from 177 colleges and universities across the United States (refer to Marini et al., 2011, for more details). National Merit Scholarship Corporation provided the College Board with the names of Commended Students, Semifinalists, Finalists, and scholarship recipients for the corresponding years, which were matched to College Board data. The scholarship awards were classified into two groups: "A Award," which is a national award and is selected by the National Merit Scholarship Selection Committee, and "B, C, or D Award," which are corporate or college-sponsored Merit Scholarships. Only students with PSAT/NMSQT scores, SAT scores, a self-reported high school GPA (HSGPA), a FYGPA, and second-year retention information were included in the analyses, resulting in a final sample size of 386,011 students.

Do those selected as scholarship winners in high school perform better in college than those not selected as scholarship winners?

Within the sample, there were 1,053 "A Award" Winners, 4,813 "B, C, or D Award" Winners, 2,330 Semifinalists, 20,321 Commended Students, and 357,494 students not receiving recognition. As stated earlier, each year NMSC names about 50,000 students as high scorers based on their PSAT/NMSQT Selection Index. Of these high scorers, about 16,000 are named Semifinalists, with the remaining 34,000 given the distinction of Commended Student. About 15,000 of the Semifinalists qualify as Finalists, with about 8,200 receiving Merit Scholarships. Of these 8,200 scholarships 2,500 are National Merit Scholarships selected by the National Merit Scholarship Selection Committee with an award value of $2,500. It is important to emphasize that the sample in the current study does not include all of the students that NMSC serves nationally. For example, over three years, 7,500 students would win a National Merit Scholarship award worth $2,500 (an "A Award"), but only 1,053 were able to be matched in the sample. The student data in this study are based upon the higher education data available to the College Board that can be linked to NMSC data. Therefore, the number of students in each recognition level is considerably lower than the population of students who were recognized by NMSC.

Measures

PSAT/NMSQT scores. Official junior year PSAT/NMSQT scores were obtained from College Board records. The PSAT/NMSQT consists of three sections — critical reading, mathematics, and writing — each scored on a 20- to 80-point scale. The PSAT/NMSQT Selection Index ranges from 60 to 240 and is the sum of the individual scores on the three PSAT/NMSQT sections.

SAT scores. Official SAT scores were obtained from College Board records. The SAT comprises three sections — critical reading, mathematics, and writing — each scored on a 200- to 800-point scale.

High School GPA (HSGPA). HSGPA was self-reported and obtained from the SAT Questionnaire, completed during registration for the SAT. Students' HSGPAs were on a 12-point scale ranging from a maximum of A+ (4.33) to a minimum of F (0.00).

Retention to the second year. Each participating institution supplied second-year retention data for their 2006, 2007, and 2008 first-time, first-year students. Students were assigned a value of 1 if they returned for their second year and a value of 0 if they did not return.

First-Year GPA (FYGPA). Participating institutions provided FYGPA for all first-year, full-time students. The range, across cohorts and institutions, is 0.00 to 4.27.

Analysis

To evaluate the primary research question of whether NMSP recognition level was related to subsequent college performance, the mean FYGPA and second-year retention rate were computed for the five recognition levels. For FYGPA, ANOVA was used to test for differences between the five levels. A significant F value indicates that at least one group's mean differs from the others. Additionally, for the ANOVA analysis, effect sizes were calculated using eta squared (η^2), which can be related to Cohen's (1998) effect sizes.[1]

It was also of interest to examine whether the percentage of students returning for their second year of college varied by NMSP recognition level. While students leave school for many reasons (e.g., Ramist, 1981), returning for the second year of college indicates a commitment to education and is associated with other positive educational gains (e.g., Baum & Ma, 2007).

1. For reference, an η^2 of 0.0099 is considered a "small effect," 0.0588 is a "medium effect," and 0.1379 is a "large effect" (Cohen, 1988).

Because retention is a categorical value, the chi-square statistic was used to test for group differences. Significant results from these analyses indicated that there was an association between recognition level and retention.

Table 1

Mean (SD) High School Academic Performance by NMSP Recognition Level

Measure	A Award Winner	B, C, or D Award Winners	Semifinalists	Commended	No Recognition
PSAT/NMSQT	223 (7)	221 (6)	222 (7)	207 (5)	160 (22)
SAT-CR	756 (42)	734 (48)	739 (52)	701 (54)	553 (87)
SAT-M	754 (41)	731 (50)	730 (52)	701 (55)	571 (90)
SAT-W	744 (46)	719 (52)	720 (56)	689 (56)	548 (87)
HSGPA	4.19 (0.18)	4.05 (0.27)	3.96 (0.35)	3.94 (0.34)	3.60 (0.49)

Table 2

FYGPA by NMSP Recognition Level

NMSP Recognition Level	N	Mean	SD
A Award Winner	1,053	3.75	0.30
B, C, or D Award Winner	4,813	3.59	0.43
Semifinalists	2,330	3.48	0.51
Commended	20,321	3.45	0.51
No Recognition	357,494	2.98	0.69

Results

High School Performance by NMSP Recognition Level

With regard to the high school academic performance of the five NMSP recognition levels, the level of recognition was positively related to PSAT/NMSQT scores, HSGPA, and SAT scores (see Table 1). Specifically, the No Recognition students had the lowest academic performance, followed by Commended students, Semifinalists, and "B, C, or D Award" Winners. The "A Award" Winners had the highest mean PSAT/NMSQT score, HSGPA, and SAT scores.

College Performance by NMSP Recognition Level

Overall, there were significant differences in mean FYGPA between the NMSP recognition levels with a small to medium effect size, $F(4, 386006) = 3792.94$, $p < .001$, $\eta^2 = .038$. For example, the No Recognition group had a mean FYGPA of 2.98, compared to 3.75 for the "A Award" Winners (see Table 2).

> The "A Award" Winners had the highest mean PSAT/NMSQT score, HSGPA, and SAT scores.

The overall F test revealed that among all the recognition levels, at least one differed significantly from the rest. However, to find out which pairs differed, post-hoc pair-wise tests must be performed. As reported in Table 3, the results of the 10 post-hoc pair-wise comparisons used to test for differences among each pair of NMSP recognition levels

revealed significant differences[2] (p < .05). These findings show that each recognition level's mean FYGPA differed significantly from the mean FYGPAs of the other award levels —"A Award" Winners had significantly higher FYGPAs than all other recognition levels, and "B, C, or D Award" Winners had significantly higher FYGPAs than all nonwinning recognition levels.

Figure 1 is provided as a graphical representation of the relationship between NSMP recognition level and FYGPA to visually demonstrate the positive relationship between the two variables. In other words, these results provide evidence for the validity of the NMSP selection process in that students who advance to higher levels of recognition earn higher grades in college.

| Table 3			
Post-Hoc Tests Comparing NMSP Recognition Level and FYGPA			
Pair-wise Comparison	Mean Difference	SE	p
A Award Winners vs. B, C, or D Award Winners	0.158	0.011	< .001
A Award Winners vs. Semifinalists	0.268	0.014	< .001
A Award Winners vs. Commended students	0.302	0.010	< .001
A Award Winners vs. No Recognition students	0.773	0.009	< .001
B, C, or D Award Winners vs. Semifinalists	0.110	0.012	< .001
B, C, or D Award Winners vs. Commended students	0.144	0.007	< .001
B, C, or D Award Winners vs. No Recognition students	0.615	0.006	< .001
Semifinalists vs. Commended students	0.034	0.011	0.021
Semifinalists vs. No Recognition students	0.505	0.011	< .001
Commended vs. No Recognition students	0.471	0.004	< .001

Table 4			
Retention to the Second Year by NMSP Recognition Level			
NMSP Recognition Level	N	Mean	SD
A Award Winner	1,053	0.98	0.15
B, C, or D Award Winner	4,813	0.97	0.17
Semifinalists	2,330	0.95	0.21
Commended	20,321	0.95	0.21
No Recognition	357,494	0.88	0.32

Similar to the FYGPA results, second-year retention rates increased as NMSP recognition level increased, with a significant association between level and retention for the overall sample, $\chi^2(4, N = 386,011) = 1494.39$, $p < .001$ (see Table 4). For example, 88% of the No Recognition group returned for their second year, compared to 95% of the Commended group, 95% of the Semifinalists, 97% of the "B, C, or D Award" Winners, and 98% of the "A Award" Winners.

Analogous to the FYGPA results, Figure 2 is provided as a graphical representation of the relationship between NMSP recognition level and second-year retention rates to demonstrate the positive relationship between the two variables. In other words, these results provide evidence for the validity of the NMSP selection process in that students who advance to higher recognition levels are more likely to return for their second year of college.

2. Dunnett's T3 was used to test the multiple comparisons. It is a post-hoc comparison procedure in SPSS that is appropriate for comparisons in which the variances and sample sizes are unequal.

Figure 1
Mean FYGPA by NMSP recognition level.
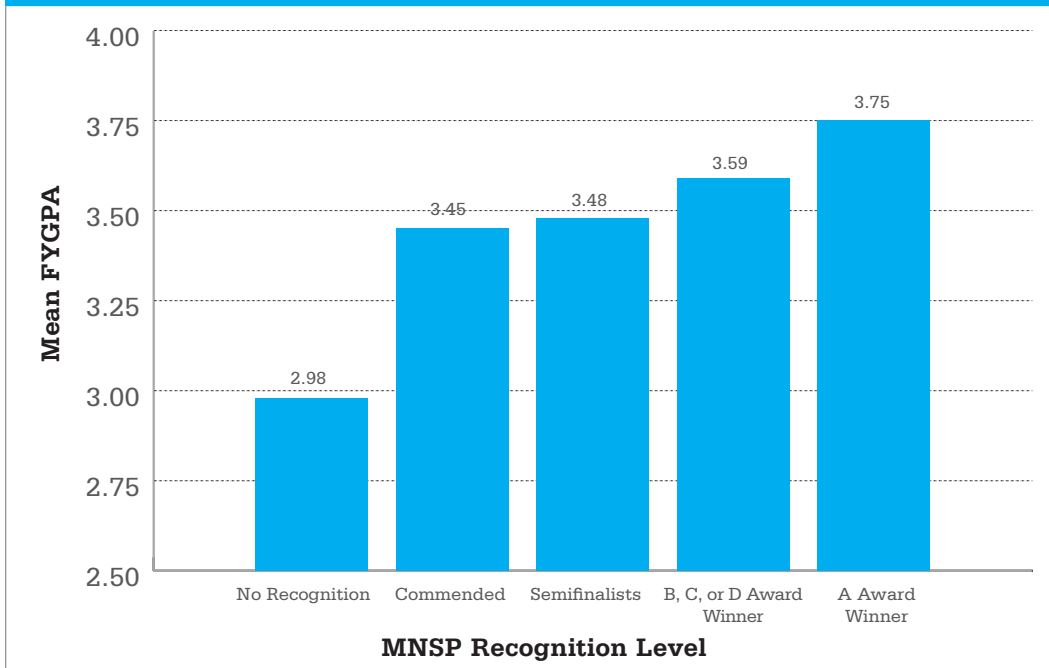
Figure 2
Second-year retention rate by NMSP recognition level.
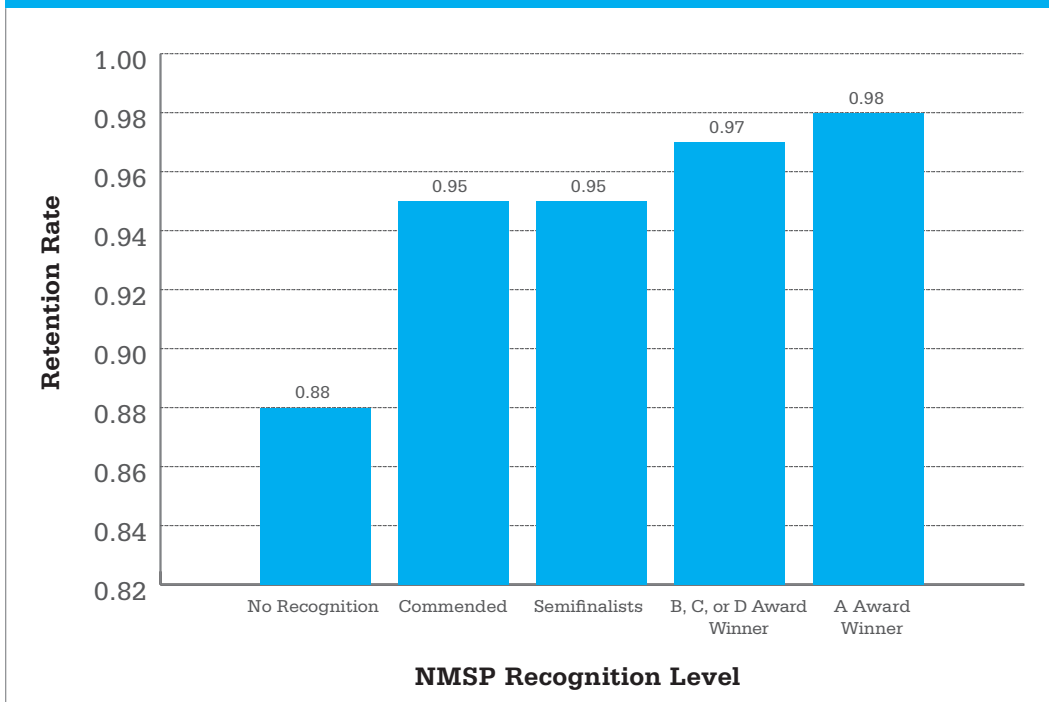
Discussion

In summary, the results indicate that National Merit Scholarship Program recognition levels are positively related to both FYGPA and retention to the second year of college. Not only do the mean FYGPA and second-year retention rates follow an increasing trend as recognition level increases, but there are also statistically significant differences between recognition levels, and each difference comparison was associated with a small-to-medium effect size.

> National Merit Scholarship Program recognition levels are positively related to both FYGPA and retention to the second year of college.

For the FYGPA analyses, post-hoc pair-wise comparisons were computed to test whether any two NMSP recognition levels (e.g., No Recognition vs. Commended students) had significantly different FYGPAs, and all post-hoc pair-wise comparisons were statistically significant. This provides statistical evidence supporting the NMSP selection process in that students who advance to higher NMSP recognition levels earn higher FYGPAs and are more likely to return for their second year of college than their non-award-winning peers.

Similar results have been found in other studies examining the impact of receiving a scholarship. According to a study done by Yang (2011), students in China who received "merit-based aid were 7.4 times more likely to achieve the top 25 percent major rankings." The study also showed that merit aid had a larger impact on learning effort and outcomes than other types of aid. Henry, Rubenstein, and Bugler (2004) compared the cumulative college GPA of students who were winners of the Georgia HOPE Scholarship just above the cut off with the cumulative GPA of those who did not win the scholarship. They found that a small but significant difference in cumulative college GPA existed, and scholarship recipients had, on average, GPAs that were .17 points higher than their nonrecipient peers. Coupled with the findings from previous research, the findings from the current study provide validity evidence in support of NMSC's selection process of identifying students who are most likely to succeed in college and most deserving of a National Merit Scholarship.

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