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First-Year Students' Employment, Engagement, and Academic Achievement: Untangling the Relationship Between Work and Grades

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This study examined the relationships among first-year students' employment, engagement, and academic achievement using data from the 2004 National Survey of Student Engagement. A statistically significant negative relationship was found between working more than 20 hours per week and grades, even after controlling for students' characteristics and levels of engagement. An examination of the indirect relationships between work and grades revealed that working 20 hours or less on campus was significantly and positively related to grades, acting through student engagement.

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Students working for pay while attending college is the norm in American higher education. The most recent national data indicate that 68% of all college students work for pay during the academic year, and one-third of these students work more than 20 hours per week (National Association of Student Personnel Administrators, 2008). The fact that most college students spend significant time working for pay is a serious concern for educators and policy makers because conventional wisdom holds that working while attending college dilutes student effort and results in lower grades. Although many scholars are concerned that grades may not be accurate indicators of academic achievement, few dispute the fact that grades are an important aspect of college (Milton, Pollio, & Eison, 1986). At most colleges and universities, grades are a factor in whether students will persist and graduate, influence entry into high-level occupations, and determine admission to graduate or professional school (Baird, 1985).

Despite the fact that many in higher education believe that working for pay hinders student success, research has failed to find a consistent relationship between work and grades. We believe the equivocal nature of the findings is due to the fact that there is not a simple linear relationship between working for pay and academic performance. That is, grades will actually improve if students work part time and then decline as the number of hours worked approaches full-time employment. Whether students work on or off campus can also influence grades. It is even possible that the relationship between work and grades is mediated by intervening college experiences. Rather than time spent working directly influencing grades, working more hours can reduce the amount of time available for students to study and be engaged in other educational activities. Studying less and not being engaged in educational activities can, in turn, lead to lower grades.

The present research examined the relationships among first-year student employment, engagement in educationally purposeful activities, and academic achievement represented by grades using data from the 2004 National Survey of Student Engagement (NSSE). Of particular interest was whether the relationships between work and grades were influenced by hours spent working, where students worked, and levels of student engagement.

Background

Studies of the relationship between working for pay and college grades have produced mixed results (Riggert, Boyle, Petrosko, Ash, & Rude-Parkins, 2006; Stern & Nakata, 1991). Researchers using data from the National Postsecondary Student Aid Study and other national datasets have found modest negative correlations between the number of hours students said they worked and self-reported grades (Horn & Malizio, 1998; King & Bannon, 2002; National Center for Education Statistics, 1994). Two recent single-institution studies reported similar results (Cox & Neidert, 2007; Klum & Cramer, 2006). Several other studies—many of which are more than 20 years old—have failed to find a significant relationship between hours worked and grades in college (Bella & Huba, 1982; Canabal, 1988; Dallam & Hoyt, 1981; Ehrenberg & Sherman, 1986; Furr & Elling, 2000; Volkwein, Schmonsky, & Im, 1989). One study even found a positive relationship between hours spent working and grades in college (Hammes & Haller, 1983) with the explanation being that the higher grades of working students were a product of greater motivation and superior organizational skills.

One possible explanation for the inconsistent findings regarding the relationship between work and grades is that the relationship is not linear. Hay and Lindsay (1969), for example, found that there was a significant negative relationship between the numbers of hours worked and grade point averages for students who worked more than 15 hours per week. A significant negative relationship was not found between working for pay and grade point average for those students who worked 15 hours or less per week. Similar results have been reported by Dundes and Marx (2006) and Orszag, Orszag, and Whitmore (2001).

Where students work appears to be as important as the number of hours spent working. After reviewing nearly 30 years of data from the Cooperative Institutional Research Program, Astin (1993) concluded that there was a modest positive relationship between working part time on campus and grades. More recently, Kuh and his colleagues reported that students who worked 20 or fewer hours on campus had higher grades than students who did not work, worked more than 20 hours per week, or worked off campus (Kuh, Kinzie, Cruce, Shoup, &

Gonyea, 2007). Based on their comprehensive reviews of research on college students, Pascarella and Terenzini (1991, 2005) concluded that the relationship between working for pay and student success is nonlinear. They also noted that part-time, on-campus employment is associated with the highest levels of academic achievement and degree attainment.

A third possible reason for weak and inconsistent findings regarding the relationship between hours spent working and grades in college is that the relationship is mediated by a variety of college-experience variables. Stated differently, the relationship between work and grades may be indirect, rather than direct. According to Riggert and his colleagues, analyses that attempt to covary for differences in students' college experiences may mask the association between work and grades when those college experiences are mediating variables (Riggert et al., 2006). A recent study of the influence of course effort and outside activities on course grades illustrates the point. Svanum and Bigatti (2006) found that the amount of time students worked for pay was not related to course grades when course effort was included as a covariate. Hours spent working had a statistically significant effect on course grades, acting through course effort.

Further supporting a mediating role for college experiences, several studies that failed to find significant relationships between hours spent working and student achievement did find significant relationships between hours spent working and engagement in educationally purposeful activities (Canabal, 1989; Furr & Elling, 2000; Volkwein, Schmonsky, & Im, 1989). In addition, many of the studies that reported significant associations between work and grades also found significant relationships between hours spent working and student engagement (Astin, 1993; Horn & Malizio, 1998; Klum & Cramer, 2006; Kuh et al., 2007). More specifically, Astin (1993) and Klum and Cramer (2006) identified a possible mediating role for cocurricular involvement. Kuh et al. (2007) found that time spent studying, participating in active and collaborative learning experiences, and student interaction with faculty members were significantly related to college grades, even after controlling for a variety of student background characteristics.

Based on the findings of previous research, two questions guided our efforts to understand the relationship between working for pay and grades in college:

1. Does the direct relationship between work and grades depend on whether students work more or less than 20 hours per week and/or on whether they work on or off campus?
2. Is the relationship between work and grades mediated by students' engagement in educationally purposeful activities?

Research Methods

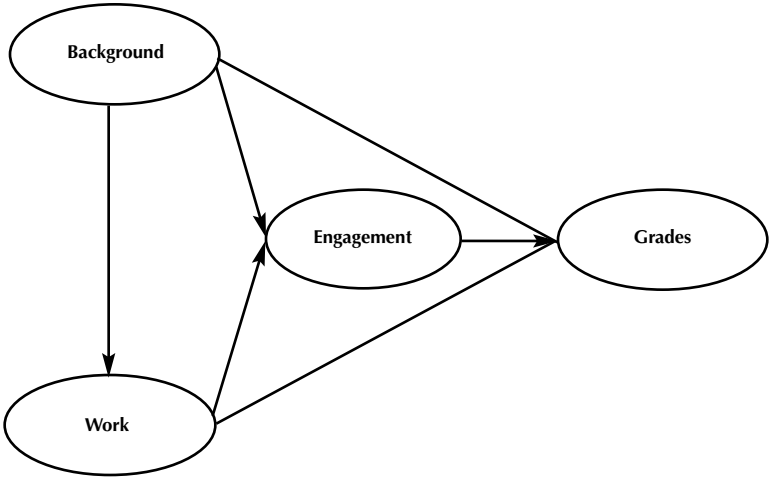
Conceptual Model

The conceptual model underlying the present research includes measures representing students' background characteristics, work experiences, levels of engagement, and grades in college. This model is displayed in Figure 1. In the model, students' college grades are presumed to be directly related to their background characteristics, levels of engagement, and work experiences. Levels of student engagement, in turn, are directly related to students' background characteristics and work experiences. Students' background characteristics are also directly related to their work experiences, and both background characteristics and work experiences are indirectly related to college grades through students' levels of engagement. It is important to note that the directions of the relationships in Figure 1 are intended to represent time ordering, rather than causal effects. For example, background characteristics such as being a woman may or may not be causally related to how many hours a student works; however, the number of hours spent working clearly does not cause students to be females.

Data Source

The data for this study came from the 2004 administration of the NSSE and information provided by participating institutions. The initial sample consisted of approximately 560,000 students attending 473 4-year colleges and universities. Students at 200 colleges and universities (42%) had the option of responding via a paper-and-pencil questionnaire or the Web, and 175 schools (37%) opted for web-only

Figure 1
Conceptual Model



administration. In 2004, NSSE introduced Web+ administration that included multiple electronic contacts and mailing a paper-and-pencil questionnaire to selected nonrespondents. A total of 98 institutions (21%) selected Web+ administration (NSSE, 2004).

The institutions that participated in the NSSE 2004 survey are very similar to the national profile in terms of geographic region and urban-rural locale. Public institutions and Master's colleges and universities were slightly overrepresented, whereas Baccalaureate-General institutions were somewhat underrepresented among participating institutions (NSSE, 2004). The average institutional response rate for the NSSE 2004 survey was 40%. Approximately 13% of the respondents completed the paper version of the survey, and 87% used the Web. Generally, administration mode does not affect the results, except that Web respondents tend to report greater use of electronic technology (Carini, Hayek, Kuh, Kennedy, & Ouimet, 2003).

The question concerning grades asks: "What have most of your grades been up to now at this institution?" In contrast, questions concerning hours worked and student engagement focus on the current academic year. In order to ensure that the time frame for all questions was

comparable, only first-year students were included in the study. Preliminary analyses also revealed that the overwhelming majority of first-year students were traditional age (98.4%), enrolled full time (98.2%), and began college at their current institutions (95.4%). Although evidence suggests that the college experiences of nontraditional, part-time, and transfer students differ markedly from their counterparts, including these students, along with highly skewed variables representing their background characteristics, was more likely to obscure important relationships than illuminate them. As a consequence, the focus of this study was on traditional-age (i.e., 18–23 year old), full-time, first-year students who began their college careers at their current institutions.

Complete data were available for 55,184 first-year students attending 392 4-year colleges and universities. Approximately 43% of the institutions were public and 57% were private. Slightly less than 20% of the institutions were doctoral-research universities, 46% were Master's colleges and universities, 18% were baccalaureate liberal arts colleges, and 16% were baccalaureate-general colleges. FTE student enrollment ranged from 338 to 47,202, with the average FTE enrollment being 6,240. Approximately 66% of the students were female, 15% were first-generation students, and 76% lived on campus. The mean equated ACT Assessment score for all students was 24.1.

Measures

NSSE questions and data provided by participating institutions were used to create the measures of college grades, student engagement, work experiences, and background characteristics used in this study. Self-report data are widely used in research on college effects, and the reliability and validity of these data have been studied extensively (Baird, 1976; Berdie, 1971; Pace, 1985; Pike, 1995; Pohlmann & Beggs, 1974). Research shows that self-report measures are likely to be valid under five conditions:

1. the information requested is known by the respondents;
2. the questions are phrased clearly and unambiguously;
3. the questions refer to recent activities;

4. the respondents think the questions merit a serious and thoughtful response; and
5. answering the questions does not threaten, embarrass, or violate the privacy of the respondent or encourage the respondent to respond in socially desirable ways (Kuh, 2001, p. 4).

The NSSE survey questions meet these criteria and yield accurate, meaningful information about students' college experiences (Kuh, 2001; Kuh et al., 2001; Ouimet, Bunnage, Carini, Kuh, & Kennedy, 2004). In addition, a comparison of self-reported grades and actual grade point averages for students from the first author's institution revealed that the correlation between self-reported and actual grades was very high (0.86), consistent with other studies (e.g., Kuh et al., 2007).

A preliminary analysis was undertaken to identify student background variables that were significantly related to grades. Based on the results of the analysis, four background variables were included in the study. Gender, coded 1 = female and 0 = male, was derived from data supplied by the institutions. Colleges and universities also provided students' ACT and/or SAT scores. SAT scores were equated to ACT scores and used as a measure of entering ability. The third background variable, first-generation status was derived from two survey questions about mother's and father's education. If neither parent graduated from college, first-generation status was coded 1; otherwise first-generation status was coded 0. Whether a student lived on campus was coded 1 if a student reported living in residence halls on campus. Students who did not indicate they lived in a residence hall were coded 0, not living on campus.

Student engagement was represented by the five NSSE benchmarks. The benchmarks represent clusters of activities that research shows are linked to positive educational outcomes. The Academic Challenge benchmark focuses on activities that demonstrate an institution emphasizes the importance of academic effort and sets high expectations for student performance, particularly in the areas of writing and higher-order thinking. Active and Collaborative Learning questions ask students to report on the extent to which they are required to think about and apply what they are learning and to work with other

students to solve problems and master difficult material. Student-Faculty Interaction items ask students to report on how often they interact with faculty members inside and outside the classroom. The Enriching Educational Experiences benchmark covers a wide range of educationally purposeful learning activities. It also includes students' reports of their diversity experiences and experiences with technology. The final benchmark, Supportive Campus Environment, focuses on students' perceptions of institutional commitment to student success and the quality of students' interactions with peers, faculty, and administration (Kuh et al., 2001). Alpha reliability estimates for the NSSE benchmark scores range from 0.62 for Enriching Educational Experiences to 0.79 for Supportive Campus Environment (NSSE, 2000).

Student-work measures were derived from two measures. The questions asked students how many hours per week they spent working for pay on campus and off campus. Students' responses were used to construct a global work measure with four levels: (1) did not work, (2) worked 20 hours or fewer per week on campus, (3) worked 20 hours or fewer per week off campus, and (4) worked more than 20 hours per week on and/or off campus. For the assessment of direct and indirect effects, three dummy measures of work experiences were constructed: (1) worked 20 hours or fewer per week on campus, (2) worked 20 hours or fewer per week off campus, and (3) worked more than 20 hours per week on and/or off campus. Null values for all three variables indicated that a student did not work.

As previously noted, the outcome variable was represented by a single question from the NSSE survey. Response options to the question about grades ranged from "C– or lower" (1) to "A" (8). A preliminary examination of the grades measure indicated that the distribution of responses was highly skewed. In order to minimize skewness, students' responses were recoded as "B– or lower" (1), "B" (2), "B+" (3), "A–" (4), and "A" (5). Descriptive statistics for the variables included in the study are presented in Table 1.

Data Analysis

As a preliminary step in the data analysis, a series of oneway ANOVA and ANCOVA models was specified and tested to determine if there

Table 1
Descriptive Statistics for the Variables Included in the Study

Variable	Mean/ Percent	Standard Deviation
Gender (Female)	0.66	0.47
Entering Ability (ACT Equated)	20.22	4.29
First-Generation Student	0.14	0.35
Student Lives on Campus	0.78	0.42
Work ≤ 20 Hours per Week On Campus	0.20	0.40
Work ≤ 20 Hours per Week Off Campus	0.16	0.37
Work > 20 Hours per Week On or Off Campus	0.13	0.33
Academic Challenge	53.44	13.23
Active and Collaborative Learning	41.26	14.95
Student-Faculty Interaction	31.96	16.57
Enriching Educational Experiences	26.91	12.01
Supportive Campus Environment	62.73	17.56
Grades During College		
B– or lower	19.3%	
B	22.5%	
B+	19.3%	
A–	18.7%	
A	20.2%	

were significant and meaningful differences in the grades of students who (1) did not work, (2) worked 20 hours or less on campus, (3) worked 20 hours or less off campus, or (4) worked more than 20 hours on or off campus. Although the measure of self-reported grades was ordinal, rather than interval, ANOVA and ANCOVA procedures were appropriate because the analysis of variance and covariance tests are generally robust with respect to violations of the assumption of interval measures (Kennedy & Bush, 1985). Initially a simple oneway analysis of variance was performed to determine if there were statistically significant differences in self-reported grades for the four work-experience categories. Next an analysis of covariance was performed with work categories as the explanatory variable and students' background characteristics as covariates. Finally, an analysis of covariance was performed that included both student background and engagement measures as covariates.

The fact that self-reported grades represented ordered categories, rather than a true interval measure, created more serious challenges for the analysis of the direct and indirect effects of students' work

experiences. When the outcome measure of interest is ordinal, some form of ordinal regression is frequently used (Long, 1997). Two problems are associated with the use of ordinal regression in the current study. First, path analysis and/or structural equation modeling cannot be used in conjunction with ordinal regression to identify direct and indirect effects; and second, the use of interval-level explanatory variables in ordinal regression can create serious problems in interpreting the regression coefficients (Jöreskog, 2005; Norušis, 2008). Some scholars have suggested that researchers use traditional OLS regression techniques, coupled with polychoric correlations that represent the relationships between ordinal and interval measures. This method is most appropriate when the metric underlying an ordinal measure is interval (Hildebrand, Laing, & Rosenthal, 1977). In addition, *Monte Carlo* studies by Jöreskog and Sörbom (1996) indicate that polychoric correlations provide a superior method of representing relationships among ordinal and interval measures.

A second challenge faced in the current study was the reliance on cluster sampling by NSSE. Initially, participating institutions selected themselves, and then random samples of students within institutions were selected. This approach is characteristic of cluster sampling, rather than simple random sampling (Kalton, 1983). When data are based on cluster sampling, the standard errors used in significance tests are too small and Type I errors are likely (Pike, 2007). A variety of statistical packages can compute adjusted standard errors that are appropriate for data from cluster samples; however, the approach used to calculate adjusted standard errors is not appropriate for calculating indirect effects (du Toit, du Toit, Mels, & Cheng, 2007). As an alternative, Thomas (2006) suggested setting a more conservative *p*-value for identifying statistically significant relationships.

In order to evaluate the direct and indirect relationships between working for pay and grades in college, a matrix of Pearson and polycohoric correlations was analyzed using the LISREL 8.8 computer program (Jöreskog & Sörbom, 2007). Because of the large number of participants in the study and challenges created by cluster sampling, a very conservative standard ($p < 0.0001$; *t-value* > 4.00) was established to assess statistical significance. The direct relationships between the three work measures and grades, net the effects of background characteristics and engagement measures, provided the evi-

dence needed to answer the first research question and identify possible moderating roles for hours spent working and where students worked. The indirect relationships between the work measures and self-reported grades were used to answer the second research question, and identify mediating effects for student engagement.

Results

The analysis of differences in self-reported grades across the four student-work categories revealed that there is a statistically significant relationship between work and unadjusted grades ($F = 101.14$; $df = 3, 55171$; $p < 0.0001$). Statistically significant differences were also found after adjusting for students' backgrounds ($F = 21.12$; $df = 3, 55176$; $p < 0.0001$) and students' backgrounds and levels of engagement ($F = 21.05$; $df = 3, 55171$; $p < 0.0001$). Table 2 presents the adjusted and unadjusted means for self-reported grades by the four work categories. Students who worked more than 20 hours per week on or off campus had substantially lower grades than students in the other three groups. Moreover, this difference persisted after adjusting for students' backgrounds and levels of engagement. The unadjusted mean for students who worked 20 hours or less per week on campus is notably higher than the means for the other groups. This difference diminishes when background characteristics are included as covariates and disappears altogether when engagement measures are included as covariates. It appears that working more than 20 hours per week is directly related to students' grades, and working 20 hours or less on campus may be indirectly related to grades.

The results of the structural equation modeling confirm the preliminary ANOVA/ANCOVA results. Table 3 presents the direct, indirect, and total effects for the relationships among background characteristics, work experiences, levels of engagement, and self-reported grades. The squared multiple correlations for the structural equations indicate that the variables in the model account for slightly less than 22% of the variance in self-reported grades. The explanatory power of the structural equations for the student-engagement measures is relatively poor. Students' backgrounds and work experiences combine to account for 1–3% of the variance in the student-engagement measures. The relationships between students' background characteristics

and work experiences also are relatively weak. The background characteristics in the model account for slightly less than 3% of the variance in whether students work 20 hours or less on campus, less than 5% of the variance in whether students work 20 hours or less off campus, and slightly less than 9% of the variance in whether students work more than 20 hours a week.

Table 2
Raw and Adjusted Means for Self-Reported Grades Given Levels of Work Experience

	Raw Means	Adjusted Means[1]	Adjusted Means[2]
Did Not Work	3.00	2.97	2.99
Worked ≤ 20 Hours per Week On Campus	3.11	3.05	3.02
Worked ≤ 20 Hours per Week Off Campus	2.95	3.00	3.00
Worked > 20 Hours per Week On or Off Campus	2.74	2.89	2.86
Total	2.95	2.98	2.97

[1] Means adjusted for students' background characteristics.
[2] Means adjusted for students' background characteristics and levels of engagement.

Table 3 shows the direct relationships between students' work experiences and self-reported grades. Working more than 20 hours on or off campus is significantly, and negatively, related to grades. Neither working 20 hours or less on campus nor working 20 hours or less off campus are significantly related to grades after controlling for students' backgrounds and levels of engagement. Because the three work measures are dummy variables, the results should be interpreted relative to the group not represented by the variables (i.e., students who do not work). Thus, the grades of students who work 20 hours or less on campus and the grades of students who work 20 hours or less off campus are not significantly different from the grades of students who do not work. The significant negative relationship between grades and working more than 20 hours indicates that students who work more than 20 hours per week have significantly lower grades than students who do not work.

Students' background characteristics and levels of engagement are significantly related to their grades in college. Being female is positively

related to college grades, as is entering ability. Being a first-generation student is not related to self-reported grades. Surprisingly, living on campus is negatively related to grades after taking into account other background characteristics, work experiences, and levels of engagement. All five student-engagement measures are significantly related to self-reported grades, with Active and Collaborative Learning scores being most strongly (and positively) related to grades. Somewhat surprising is the finding that Enriching Educational Experiences scores are negatively related to self-reported grades after controlling for other variables in the model.

Table 3
Direct, Indirect, and Total Relationships Among Background Characteristics, Work Experiences, Engagement, and Grades

Direct ***Indirect*** **Total**	**Work ≤ 20 On Campus**	**Work ≤ 20 Off Campus**	**Work > 20 On/Off Campus**	**AC**	**ACL**	**SFI**	**EEE**	**SCE**	**Grades**
Female	0.044*	0.041*	-0.002	0.056*	-0.006	-0.024*	0.052*	0.012	0.149*
				*0.002**	*0.005**	*0.005**	*0.004**	*0.001*	*-0.001*
				0.058*	**-0.001**	**-0.019***	**0.056***	**0.013**	**0.148***
Entering Ability	0.036*	-0.027*	-0.071*	0.047*	0.045*	-0.018*	0.113*	-0.020*	0.436*
				0.000	*-0.004**	*-0.003**	*-0.001*	*0.005**	*0.001*
				0.047*	**0.041***	**-0.021***	**0.112***	**-0.015**	**0.437***
First Generation	0.024*	0.010	0.042*	-0.017*	-0.033*	-0.032*	-0.031*	-0.002	0.003
				*0.002**	*0.006**	*0.006**	*0.004**	*0.000*	*-0.004**
				-0.015	**-0.027***	**-0.026***	**-0.027***	**-0.002**	**-0.001**
On Campus	0.155*	-0.208*	-0.265*	0.047*	0.077*	0.051*	0.080*	0.070*	-0.066*
				*0.002**	*-0.015**	*-0.010**	*-0.005**	*0.022**	*0.018**
				0.049*	**0.062***	**0.041***	**0.075***	**0.092***	**-0.048***
Work ≤ 20 On Campus				0.048*	0.093*	0.102*	0.073*	0.055*	0.009
									*0.015**
									0.024*
Work ≤ 20 Off Campus				-0.004	0.035*	0.019*	0.017*	-0.028*	0.007
									*0.003**
									0.010
Work > 20 On/Off Campus				0.022*	0.085*	0.084*	0.048*	-0.029*	-0.029*
									*0.011**
									-0.018*
AC									0.027*
ACL									0.114*
SFI									0.048*
EEE									-0.048*
SCE									0.037*
SMC	0.029	0.049	0.089	0.012	0.019	0.016	0.032	0.013	0.219

* $p < 0.0001$

The relationships between work experiences and students' background characteristics provide additional information about who works and how much they work. Being female is positively related to working 20 hours or less on campus and working 20 hours or less off campus. Entering ability is positively related to working 20 hours or less on campus, but negatively related to the other two work measures. Being a first-generation student is positively related to working 20 hours or less on campus. At the same time, first-generation status is positively related to working more than 20 hours a week on or off campus. Living on campus is positively related to working on campus 20 hours or less per week and negatively related to the remaining work measures.

Students' work experiences are significantly related to their levels of engagement in educationally purposeful activities, and these relationships have important consequences for the indirect relationships between work and grades. Working 20 hours or less on campus is positively related to all five engagement measures, with the strongest relationships being observed for the Student-Faculty Interaction and Active and Collaborative Learning measures. Working 20 hours or less per week off campus is positively related to two engagement measures: Active and Collaborative Learning and Student-Faculty Interaction. Working 20 hours or less off campus is negatively related to Supportive Campus Environment scores. Working more than 20 hours a week is positively related to all of the engagement measures, except Supportive Campus Environment. The relationship between working more than 20 hours and Supportive Campus Environment scores is negative.

All three work-experience measures have statistically significant and positive indirect relationships with grades. The significant positive indirect relationship between grades and working 20 or fewer hours on campus is sufficiently strong that the total effect (i.e., direct + indirect) is also positive and statistically significant. Conversely, the significant indirect relationship between grades and working 20 hours or less off campus is not sufficiently strong to produce a total relationship that is statistically significant. Finally, the significant positive indirect relationship between grades and working more than 20 hours per week offsets to some extent the significant negative direct relationship between the two measures. Nevertheless, the total relationship

between working more than 20 hours per week and grades is negative and statistically significant.

Limitations

Using self-reported grades as the dependent variable is a limitation. While studies show high correlations between actual and reported grades, it is not possible to say with certainty that the reports used in this research are completely accurate representations of students' academic performance. In addition, the self-reported grades variable is an ordinal, rather than an interval measure. Even though the analytic approaches used in this study are robust with respect to ordinal measures, they are imperfect representations of the underlying construct of academic achievement. Reliance on grades as the sole measure of academic achievement is another limitation of this research. As Dundes and Marx (2006) noted, grades can mean very different things across institutions. At the very least, differences in grading practices across institutions may have attenuated the relationships reported in this study.

The study is also limited to 4-year institutions participating in NSSE 2004. In general, the institutions participating in NSSE are typical of all 4-year colleges and universities. However, the most highly selective institutions are underrepresented among NSSE participants. Although the results from the 2004 NSSE survey are generally consistent with the results from other NSSE administrations, this study may be limited by the fact that only 1 year of data was analyzed. If students from institutions participating in other years were included, the results might differ in unknown ways. In addition, the NSSE questionnaire is relatively short and does not measure many relevant aspects of students' college experiences. If additional questions about college experiences had been included in this research, different results might have emerged. The sampling procedures used in the NSSE survey also introduced tradeoffs into the research. Although adjusted standard errors provide the most appropriate test of relationships in a cluster sample, the standard errors cannot be calculated for indirect relationships. In order to evaluate the significance of indirect relationships, it was necessary to rely on the less than ideal approach of using extremely conservative standard errors for significance tests.

Another limitation stemming from including only first-year students is that these students have not experienced the full breadth of the college life. Perhaps upper-class students have different work habits and, therefore, the interaction between work and student engagement described in this study may be different for upper-division students. Finally, this study was limited by the fact that only full-time, traditional age, native students were included in the analyses. Increasing numbers of students entering higher education today are part-time, nontraditional, transfer students. In fact, many of the students who are most likely to need to work while attending college were the students excluded from this study. Unfortunately, these students were not well represented among the first-year cohort in the 2004 NSSE survey. Future research should focus on the relationships between work and grades for these groups.

Discussion

Despite these limitations, the results of the present study have important implications for theory and practice. First and foremost, the results suggest that first-year students' work experiences are directly related to their grades in college. However, these findings also suggest that the relationship between working for pay and grades in college is conditioned by the number of hours spent working. The grades of first-year students who worked 20 hours or less were not significantly different from the grades of students who did not work. Students who worked more than 20 hours per week did have significantly lower grades than students in the other three groups. Furthermore, where first-year students worked—on or off campus—was not directly related to their grades in college. However, where these students worked was an important factor in the indirect relationships between work and grades. The significant positive indirect relationship between working 20 or fewer hours on campus and self-report grades was sufficiently large to produce a significant positive relationship overall. This was not the case for any other work-experience group.

For student affairs staff and other professionals involved in student employment and concerned with student success, these results indicate that students should be strongly encouraged to work no more than 20 hours a week to minimize the potential negative conse-

quences of work on grades. For employment to have a positive, integrative effect on first-year students' college experiences and their grades, students should work on campus 20 hours or less. Thus, creating meaningful work experiences for students on campus is a key element in an overall strategy designed to foster student achievement and success. Student affairs divisions should continue to lead the way in employing students. They should also actively encourage other units to make extensive use of student workers.

Unfortunately, the results concerning the direct relationships between first-year students' characteristics and grades, and between background characteristics and work experiences suggest that first-year students who are most at risk in terms of poor academic performance, are also those more likely to work more than 20 hours and/or to work off campus. For example, the significant positive relationships between grades and both gender and entering ability indicate that males and lower-ability students are more likely to have lower grades at the end of their first year. At the same time, males and lower ability students are less likely than females and higher-ability students to work 20 hours or less either on or off campus. Lower-ability students are much more likely than their high-ability counterparts to work more than 20 hours per week.

First-generation students are more likely to work on campus 20 hours or less and to work more than 20 hours. The fact that these students are more likely to work on campus may be the result of special programs for first-generation students. It is equally clear from the positive relationship between first-generation status and working more than 20 hours per week that much more remains to be done to offset the challenges faced by first-generation students during the first year of college. The negative relationship between living on campus and grades should be viewed with considerable skepticism. An examination of the zero-order correlation between living on campus and grades revealed that the coefficient was positive and statistically significant. Thus, it appears that the negative relationship between living on campus and grades is a statistical artifact or suppressor effect (Ethington, Thomas, & Pike, 2002).

Although modest, the significant relationships between the student engagement measures and college grades generally confirm the find-

ings reported by Kuh et al. (2007). Four of the five NSSE benchmark scales were significantly and positively related to the self-reported grades of first-year college students. Moreover, the negative relationship between Enriching Educational Experiences scores and grades should be considered a statistical artifact (i.e., suppressor effect) given that the correlation between the benchmark and grades was positive and statistically significant. Of the four benchmarks that are positively related to grades, the strongest relationships are for Active and Collaborative Learning and Student-Faculty Interaction. Significantly, working 20 hours or less on campus is positively related to both Active and Collaborative Learning and Student-Faculty Interaction scores. The relatively weak relationship between Academic Challenge scores and grades is somewhat surprising because time spent studying is a component of the Academic Challenge benchmark. It appears that the other components of the benchmark (e.g., writing experiences and emphasis on higher-order thinking) may mask the effects of time spent studying.

Once again, these findings have important implications for student affairs professionals and others interested in the success of first-year students. Helping first-year students become engaged in activities that encourage active and collaborative learning and foster positive interactions between students and faculty members can be very beneficial to students' academic success. Campus leaders should also consider intentionally designing active and collaborative learning experiences for first-year students that also appear to be linked with more frequent student-faculty interaction. The importance of a supportive campus environment also is worth noting. First-year students' perceptions of the campus environment were positively related to their grades. Furthermore, first-year students who worked more than 20 hours per week on or off campus generally perceived the campus environment to be less supportive than other students.

Conclusion

Whether or not grades are synonymous with success in college, it is the case that grades are related to persistence of first-year students. As a result, student affairs professionals and others in higher education who are committed to student success need to be mindful of the fac-

tors that influence grades in college. Working for pay full time, or nearly full time (i.e., more than 20 hours per week), clearly appears to be detrimental to the academic success of first-year students. Conversely, working 20 hours or fewer on campus can be positively related to student success because it is related to greater levels of participation in active and collaborative learning activities and positive interactions between students and faculty members.

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