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Predictors of College Success: Symptoms of ADHD, Psychological Well-being, Appreciation of the Liberal Arts, and Understanding of College Policies

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Abstract

The present study was designed to identify predictors of college student success. More specifically, the study examined seven potential predictors for each of three measures of student success. These predictors were year in college, three academic variables and three measures of psychological well-being. It was found that self-identification of ADHD symptoms was a negative predictor of student success, whereas understanding college policies, study skills and appreciation of the liberal arts were all positive predictors of at least one of the measures of student success.

Keywords: college success, well-being, academics

1. Introduction

1.1. Symptoms of ADHD, psychological well-being, appreciation of the liberal arts and college student success

Measures of student success in college have been extensively studied and often focus on grade point average (GPA) and graduation rates. Graduation rate is not only a measure of student success, but is also increasingly being viewed as an overall measure of the success of the college or university. However, an overall measure of college or university success should be based on a broader definition that includes measures such as students' satisfaction with their choice of higher education institution, as well as with their choice of academic major, though these

have been much less commonly studied. Regardless of the definition, some students are at an increased risk of experiencing difficulties with success in college. Among these are students with ADHD, who have been found to have lower levels of academic achievement [1], as well as poorer social and emotional adjustment to college [2]. Understanding predictors of college student success from a variety of perspectives will allow for more targeted interventions to improve retention and adjustment, both in the general college population and particularly among students with elevated symptoms of ADHD.

2. Predictors of success in college

Not surprisingly, due to the importance of higher education for both students and society, many studies have examined the predictors of student success. Early studies noted, for instance, that college success, as measured by college grade point average, was positively correlated with high school success as measured by high school GPA, as well as by achievement test scores (reviewed in [3]) and these variables continue to predict academic success [4, 5]. Additional variables such as the mastery of study skills have also been found to be positively associated with college GPA, both in the past and in more recent research [6, 7].

However, college success involves more than simply the student's GPA. More recently, the focus on this subject has broadened to include other factors that define college success. For example, a major factor is how well a student adapts to college life and its demands. To measure this construct, Baker and Siryk [8, 9] developed the Student Adaptation to College Questionnaire. Among the factors that have been found to be related to adaptation to college are student religiosity [10], marriage status [11] and attitudes toward seeking professional counselling [12]. Recently, Norvilitis and Reid [7] examined multiple predictors for several measures of academic success and found that parental encouragement of intellectual curiosity during childhood, ADHD symptomatology and varying motives for attending college were also predictive of success, as indicated by measures of academic adjustment, social adjustment and satisfaction with life.

Although student adaptation to college has been studied in some detail, fewer studies have utilized an overall measure of student satisfaction as a measure of college success [13, 14]. This would seem to be a reasonable measure and though limited, the data available support the view that a general measure of student satisfaction is associated with college GPA and measures of student adaptation to college [13, 14]. A more specific measure, satisfaction with one's major, also appears to be an important correlate of success in college. As expected, the evidence indicates that choice of major and career directedness are both associated with increased student retention [15]. Conversely, frequent change of major is associated with lower levels of college student well-being [16].

Thus, a number of variables have been reported to be associated with college success. The present study incorporates a comprehensive set of measures for student success and focuses on how these relate to an at-risk population of students, i.e., those exhibiting symptoms of ADHD, depression or anxiety. More specifically, the present study sought to explore the

predictors of three facets of college student success: GPA, student adaptation to college and satisfaction with one's major. As noted above, many predictors of student success have been examined in the past, while others still require additional research. For example, Norvilitis and Reid [7] noted that an appreciation of the liberal arts is associated with student success. This suggests that the degree of correspondence between the student's educational values and the liberal arts college's educational mission is important; however, to date, this finding has not been replicated. Another underexplored predictor of college student success is the student's understanding of college policies. In order for students to graduate, they must not only maintain an adequate GPA, but they must also adhere to numerous college policies such as those related to repeating courses, the number of credits required to graduate and meeting prerequisites for courses. It is reasonable to expect that students with a better understanding of these policies will be more successful in college.

3. Attention deficit hyperactivity disorder and success in college

College students with ADHD are at a unique disadvantage when it comes to college adjustment. Symptoms of ADHD are associated with poorer study skills; specifically, those with ADHD prefer studying at a surface level, rather than at a deep level both in terms of motives and strategies [17]. Related to this, higher levels of ADHD symptoms have been reported to be negatively associated with college success as measured by academic adjustment and GPA in the US [18, 19] as well as in China [20].

In addition to their academic struggles, college students with more symptoms of ADHD also have difficulties with peers. Those with ADHD report feeling less competent at providing emotional support to and managing interpersonal conflict with their peers who exhibit fewer symptoms, though they do not report more difficulties with initiating social contact or disclosing personal information [21]. This pattern suggests that, although those students with more ADHD symptoms may be able to initiate friendships, subsequently progressing to the deeper, supportive friendships that are critical to success in college – particularly for those living away from home – may be especially challenging.

Further complicating matters, those with more symptoms of ADHD are at an increased risk for other disorders, most notably, anxiety and depression. Estimates show that up to 36% of children and adolescents with ADHD also meet the criteria for anxiety disorders [22]. Although specific rates of anxiety disorders in college students have not been determined, it is clear that many students with ADHD also struggle with anxiety symptoms and disorders. For example, Nelson, Lindstrom and Foels [23] reported that close to half of college students with ADHD reported clinically meaningful levels of test anxiety. Similarly, those with ADHD also experience higher rates of depression than the general college student population [24-26].

As a result, the present study sought to examine a series of predictors of different aspects of college student success with an emphasis on students in at-risk populations. More specifically, predictors of success included indicators of psychological well-being, including measures of ADHD, depression and anxiety, as well as a series of more general predictors including student

understanding of college policies, appreciation of the liberal arts and study skills. The study incorporated three measures of student success: GPA, attachment to their college and satisfaction with their academic major. It was predicted that student satisfaction with their choice of academic major and college would be associated with their psychological characteristics, as well as with the match between their academic goals and the mission of the college. More specifically, it was hypothesized that those students with elevated symptoms of ADHD, anxiety and depression would have lower grade point averages and poorer study skills, as well as less satisfaction with their choice of major and college. Finally, it was predicted that at a liberal arts college, students' satisfaction with their academic major and choice of college would be correlated with the degree to which they personally valued the liberal arts.

4. Method

4.1. Participants

A total of 212 participants enrolled in a large, urban, public, liberal arts college completed the survey. Of these, 72 (34%) were male and 140 (66%) were female. There were 48 (23%) freshmen, 40 (19%) sophomores, 70 (33%) juniors, 42 (20%) seniors and 11 (5%) second year seniors. The participants self-identified as 146 (71%) Caucasian, 44 (21%) African American, 13 (6%) Hispanic, 3 (1%) Asian and 1 (.5%) Native American.

Of the 149 students who reported their grade point average, the mean was 3.17 ($SD = .50$). First year students and transfer students in their first semesters did not have GPAs and were therefore unable to report this number. Most students reported that they had not changed their major. Among the participants, 131 (62%) reported no changes in major, 51 (24%) reported one change, 15 (7%) reported two, 11 (5%) reported three and 4 (2%) reported four. Most students had also not changed colleges. Among the participants, 124 (59%) had not changed schools, 70 (33%) had attended one other college prior to their current one, 15 (7%) had attended two prior schools and 3 (1%) had attended three or more prior colleges.

4.2. Materials and procedure

Participants were recruited from courses from a variety of departments across campus and were given the opportunity to receive extra credit for completing the questionnaire. Questionnaires were to be completed outside of class, following informed consent and were collected at the beginning of the next two meetings of the class in which they were handed out. The questionnaire assessed demographic information such as gender, ethnicity, class level and GPA, as well as the following:

4.2.1. Predictors of college student success

The **Current Symptoms Scale** [27] was used to assess the total symptoms of inattention and hyperactivity using a symptom checklist. The 18 items were completed on a scale rating from

1 (*Never or Rarely*) to 4 (*Very Often*). In the present study, internal consistency was .82 for inattention and .77 for hyperactivity. Higher scores indicated more symptoms of ADHD.

IPIP Depression and Anxiety Scales [28] were used to assess symptoms of depression and anxiety. The 10 items measuring depression and 10 items measuring anxiety were completed on a scale of 1 (*Applies very closely to me*) to 5 (*Doesn't apply to me at all*). In the present study, internal consistency was .90 for depression and .84 for anxiety. Higher scores indicated more symptoms of depression or anxiety.

The **Study Skills Scale [19]** is a 14-item measure for assessing one's study habits on a scale from 1 (*Not at all like me*) to 4 (*Always or very much like me*). In the present study, internal consistency was .72. Higher scores indicated better self-reported study skills.

Understanding of College Policies Scale (UCP; created for this study) was used to examine how well students were aware of the requirements for graduation. The 11 multiple choice items were scored as correct or incorrect. Items inquired about such topics as the minimum GPA required for good academic standing, the number of credits required to graduate and policies regarding repeating courses. The score was the total number of items answered correctly.

The **Appreciation of the Liberal Arts Scale-Revised (ALAS; [27])** is a 24-item scale for assessing how important one feels the liberal arts are to his or her education on a scale from 1 (*Not at all like me*) to 5 (*Definitely describes me*). For the present study, internal consistency was strong ($\alpha = .88$). Higher scores indicated a greater appreciation of the liberal arts.

4.2.2. Measures of college student success

The **Student Adaptation to College Questionnaire-Attachment Subscale (SACQ; [9])** assessed a student's attachment to his or her college on a scale of 1 (*Applies very closely to me*) to 5 (*Doesn't apply to me at all*). The 14-item measure had strong internal consistency ($\alpha = .81$). Higher scores indicate greater attachment to college.

The **College Major Satisfaction Questionnaire** (created for this study) evaluated the individual satisfaction of a student with his or her major on a scale from 1 (*Very untrue for me*) to 5 (*Very true for me*). Statements regarding this 15-item scale included "I am excited by the classes in my major" and "If I had to start college over, I would choose another major." Internal consistency was strong ($\alpha = .85$). Higher scores indicated greater satisfaction with one's major.

5. Results

5.1. Relations among predictor variables

The predictor variables of inattention, hyperactivity, depression, anxiety, study skills, UCP and ALAS were related to one another, but generally appeared to represent unique constructs. However, the measures for psychological well-being were correlated with one another (See Table 1). In particular, the strong correlation between inattention and hyperactivity was problematic in that collinearity diagnostics for the subsequent regression analyses indicated a

strong degree of overlap between the two variables. Therefore, hyperactivity was eliminated from the regression analyses. Although depression and anxiety were also strongly related, collinearity diagnostics did not indicate a substantial overlap and as a result, both measures were included in subsequent analyses.

	Inattention	Hyperactivity	Depression	Anxiety	Study Skills	UCP	ALAS
Inattention	-	.65***	.39***	.25***	-.40***	-.02	-.19**
Hyperactivity	-	-	.29***	.22**	-.16*	.08	-.06
Depression	-	-	-	.57***	-.19**	.06	-.15*
Anxiety	-	-	-	-	-.19**	.09	-.11
Study Skills	-	-	-	-	-	-.01	.21**
UCP	-	-	-	-	-	-	.13

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

Table 1. Relations among predictor variables.

5.2. Relations among measures of student success

The measures of student success, SACQ, GPA and major satisfaction were marginally related to one another, but appeared to largely be tapping independent constructs. SACQ was related to major satisfaction ($r = .33$, $p < .001$) but not to GPA ($r = .12$, $p = .16$). Major satisfaction was related to GPA ($r = .27$, $p = .001$).

5.3. Student success in different populations

ANCOVAs controlling for year in school were used to examine differences in the three student success measures according to whether or not the students had transferred colleges. There were no differences in GPA [$F(1, 144) = .42$, $p = .52$, partial $\eta^2 = .003$], SACQ [$F(1, 207) = .27$, $p = .61$, partial $\eta^2 = .001$], or major satisfaction [$F(1, 188) = 1.96$, $p = .16$, partial $\eta^2 = .01$] by transfer status.

ANCOVAs controlling for year in school were also used to examine differences in the three student success measures according to whether or not students had changed majors. There were no differences in GPA [$F(1, 144) = .42$, $p = .52$, partial $\eta^2 = .003$], SACQ [$F(1, 207) = .27$, $p = .61$, partial $\eta^2 = .001$], or major satisfaction [$F(1, 188) = 1.96$, $p = .16$, partial $\eta^2 = .01$] according to major change status. We considered that perhaps students who had changed majors only once (e.g., from undeclared to a major) might be similar to those who had never changed majors. Regrouping the students into those who had never changed majors or who had changed only once and those who had changed more than once did not substantively alter the results.

5.4. Predicting student success

Three simple regressions were completed to examine the relative contributions of inattention, depression, anxiety, study skills, UCP and ALAS in predicting GPA, SACQ and major satisfaction (see Table 2). In each regression, year in college was entered in the first step to control for any effects due to this factor. Different predictors emerged for the three measures of success. GPA was predicted only by the better understanding of college policies. SACQ was predicted by lower levels of inattention, better study skills and greater appreciation of the liberal arts, with an understanding of college policies approaching significance. Greater major satisfaction was predicted by fewer years in college, better study skills, greater understanding of college policies and greater appreciation of the liberal arts.

Predictor Variable	B	SE B	B	p
<i>GPA</i>				
Year	-.05	.04	-.12	.22
Inattention	-.09	.13	-.07	.51
Depression	-.06	.07	-.10	.42
Anxiety	.08	.07	.13	.25
Study Skills	.14	.11	.12	.22
UCP	.08	.03	.22	.02
ALAS	.00	.08	.00	.98
<i>SACQ</i>				
Year	.01	.03	.02	.76
Inattention	-.35	.10	-.26	.001
Depression	-.09	.06	-.12	.14
Anxiety	-.09	.06	-.12	.13
Study Skills	.26	.10	.19	.007
UCP	.05	.03	.13	.07
ALAS	.17	.07	.16	.02
<i>Major Satisfaction</i>				
Year	-.10	.04	-.19	.01
Inattention	-.12	.11	-.09	.30
Depression	.01	.07	.02	.85
Anxiety	-.04	.07	-.05	.57
Study Skills	.31	.11	.22	.005
UCP	.06	.03	.15	.05
ALAS	.32	.08	.31	<.001

Note: GPA: $R = .30$, $R^2 = .09$, Adj. $R^2 = .03$, $F(7, 117) = 1.60$, $p = .14$.

SACQ: $R = .57$, $R^2 = .33$, Adj. $R^2 = .30$, $F(7, 166) = 11.54$, $p < .001$.

Major satisfaction: $R = .51$, $R^2 = .26$, Adj. $R^2 = .23$, $F(7, 151) = 7.64$, $p < .001$.

Table 2. Summary of regression analyses predicting student success.

6. Discussion

The present study was designed to identify variables that predict college student success. In addition to GPA, two less common measures of student success were also included, i.e., student adjustment to college and student satisfaction with their choice of academic major. The predictors included year in college, as well as three measures broadly related to academics: student study skills, their understanding of college policies and their appreciation of the liberal arts. Particular emphasis was also placed on students' psychological well-being as a predictor of their college success. This was accomplished by including measures of ADHD symptoms, depression and anxiety. The goal was, therefore, to identify both the academic and psychological predictors of three definitions of college student success.

GPA has been the most widely studied measure of student success. In the present study, regression analyses indicated only one of the seven predictors, students' understanding of college policies, as a significant predictor of GPA. This was surprising, as previous research has indicated, for example, that the mastery of study skills was positively correlated with GPA, while students' self-reports of ADHD symptoms have been found to be negatively correlated with this measure of college student success.

There were three significant predictors for student adjustment to college. Specifically, ADHD was a negative predictor, whereas both study skills and the ALAS were positive predictors. A fourth predictor, an understanding of college policies, approached significance. These outcomes were as expected. Students reporting symptoms of ADHD have been found to have difficulties with peer relations [21]; as such, it is not surprising that they would experience the transition to college as challenging. The positive relationship between adjustment to college and study skills was also expected, as studying is a fundamental activity students engage in while attending college and thus, facility with this skill will likely promote a sense of belonging. Similarly, correspondence between the goals of the college and a student's values also appear as conducive to a smooth adjustment to college. The data for this study were collected at a liberal arts institution and it is therefore not surprising that students who reported higher scores on the ALAS also reported higher scores on the SACQ.

Four of the seven measures were found to be predictors for student satisfaction with their choice of academic major. Of these, only year in college was found to be a negative predictor. The negative direction of this predictor was surprising, as we had assumed students' satisfaction with their major to increase as they advanced toward graduation. However, it appears to be the case that many students' enthusiasm for their major declined as they enrolled in increasingly challenging courses. Not surprisingly, study skills efficacy is positively associated with satisfaction with major. The positive relationship between satisfaction with academic major and an understanding of college policies may reflect students' understanding of the academic requirements needed to graduate, including not only the specific courses that are necessary, but also their prerequisites, as well as a better understanding of the academic expectations inherent in their courses. Finally, we interpreted the positive relationship between major satisfaction and the ALAS as reflecting the correspondence between the students' and the college's goals.

In conclusion, the present study has identified predictors for three measures of college students' success. Perhaps most surprising was the prominence of understanding college policies. This measure was a significant predictor for two of these three measures of student success, GPA, as well as satisfaction with academic major and approached significance for the third, i.e., student adjustment to college. Two other predictors that were significant for two of the three measures of student success were study skills and the ALAS. It appears, therefore, that students perceive effective study skills to be a defining characteristic of what it means to be successful in college, as is the fit between their goals and values as measured by the ALAS and those of the college they are attending.

At first glance, the three measures of psychological well-being – ADHD, depression and anxiety – did not appear to be central in determining student success, as only one of these, ADHD, was found to be significantly related to a measure of student success and then only for student adjustment to college. As this was unexpected, we examined these results in more depth. First, it is worth noting that the Shapiro-Wilks Test of Normality indicated that both ADHD and depression were skewed, with somewhat more cases with fewer symptoms than would be expected in a normal distribution. Anxiety was normally distributed. It is possible that this skew may have masked any relationships between ADHD and depression and success in college. This may have happened because students with these conditions had not been enrolled in the classes surveyed or they were not able to complete the survey. Because students in their first semester at the college were not able to enter a GPA and because students with symptoms of ADHD and depression have been reported to have lower rates of retention, it is possible that we had a lower than expected number of students with these disorders who participated. On the other hand, the lack of relationship between ADHD, depression and anxiety and success in college may be encouraging, as it might suggest that college interventions are being effective in accommodating students with psychological concerns. However, as noted above, the previous literature indicates that these psychological variables have repeatedly been associated with GPA. Thus, while it is heartening to view our findings as being an indication of the success of these interventions, we suggest caution and instead encourage additional studies that include multiple measures of student success, as well as a range of potential academic and psychological predictors.

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