THE EFFECT OF SATISFACTION ON PERFORMANCE AND VICE VERSA: AN EMPIRICAL STUDY

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ABSTRACT

This study examines how, when, and to what extent satisfaction affects performance at the individual level. This study replicates and extends the research on the satisfaction-performance relationship using 5,185 college students. The findings of the current study indicate that, while the effect of satisfaction on performance, as measured by cumulative grade point average (GPA), was ß=.13, the reverse was ß=.08. The findings suggest that although the effects were positive and statistically significant, practically they were weak. This study also extends previous studies by including student characteristics (e.g., ACT scores and average hours worked) into the model. The study reveals that past performance, in our case, high school performance, as measured by ACT scores, was a strong predictor (ß=.34) of college students' performance. The study's findings, limitations, and multiple avenues for future research are discussed.

INTRODUCTION

The satisfaction-performance relationship is one of the most controversial issues to have emerged from organizational psychology research. Workplace satisfaction has been the subject of research since the Hawthorne studies of the 1920s. Researchers have endeavored to demonstrate that a satisfied worker is a productive worker. While scientific research has been devoted to understanding the relationship between satisfaction and performance over the past 90 years, the issue remains unresolved. Although empirical attempts to resolve the satisfaction-performance relationship have diminished, the controversy has remained alive. Put it differently, despite the mixed empirical results that support the idea that satisfaction leads to better performance (Brayfield & Crockett, 1955; Iaffaldano & Muchinsky, 1985; Judge, Thoresen, Bono, & Patton, 2001; Katebi et al., 2022; Vroom, 1964), the impact of satisfaction on performance continues to stimulate research and re-examination of prior attempts. Despite the mixed findings of the satisfaction-performance relationship, several studies have found workplace satisfaction to be a significant mediating factor in many organizational outcomes such as turnover intention (Coomber & Barriball, 2007; Curtis, Abratt, Rhoades, & Dion, 2011; Raddaha et al., 2012), perceived

organizational justice (Dong & Phuong, 2018; Karim & Rehman, 2012), organizational citizenship behavior (Korkofingas, 2010; Mustafa, Martin, & Hughes, 2016), and employee complaint (Coomber & Barriball, 2007; Dabholkar & Thorpe, 1994; Yousef, 1998).

Similarly, in the academic setting, there are a few studies on students' satisfaction-performance (GPA) relationship and provided mixed results (Bean & Bradley, 1986; Brouwer et al., 2022; Dhaqane & Afrah, 2016; Martirosyan, Saxon, & Wanjohi, 2014; Oja, 2011; Pike, 1993; Roszkowski & Ricci, 2005; Schreiner, 2009). Despite those mixed results, student satisfaction is a major concern for higher education institutions (HEIs) as satisfaction is a significant mediating factor in several college outcomes such as student retention (Braxton, Doyle, & Hartley, 2014; Dhaqane & Afrah, 2016; Elliott, 2002; Nastasić, Banjević, & Gardašević, 2019; Schreiner, 2009), student persistence (Aitken, 1982; Styron, 2010; Tinto, 1997; Wintre & Bowers, 2007), graduation rate (Borden, 1995; Bryant & Bodfish, 2014; Jamelske, 2009; Pascarella & Terenzini, 2005; Schertzer & Schertzer, 2004), personal and professional achievement (Bean & Bradley, 1986; Hermans, Haytko, & Mott-Stenerson, 2009; Pike, 1993), and recruitment of new students (Elliott & Healy, 2001; Gruber, Fub, Voss, & Gläser-Zikuda, 2010; Shahsavar & Sudzina, 2017). Hence, student satisfaction is of compelling interest to HEIs in measuring their effectiveness in the prevailing environment of accountability and budgetary constraints (Browne, Kaldenberg, Browne, & Brown, 1998; Bryant & Bodfish, 2014).

Unlike service industries, which treat satisfaction as a goal in and of itself, HEIs typically view it as a means to an end (Hasan et al., 2009; Kanwar & Sanjeeva, 2022; Schreiner, 2009). The higher the students' satisfaction with the college experience, the greater the likelihood that students will remain affiliated with and committed to the HEI (Aitken, 1982; Ali et al., 2016; Celuch & Robinson, 2016). Moro-Egido & Panadés (2010) argue that if students are viewed as consumers of HEI, their satisfaction is crucial to institutional success because effective institutions would have satisfied customers. HEIs tend to care about student satisfaction because of its potential impact on students' recruitment, retention, and graduation rates. Consequently, student satisfaction is an important attribute that HEIs frequently measure.

An examination of the literature on student satisfaction indicates that there is a growing body of literature on student satisfaction (e.g., Bryant & Bodfish, 2014; Dhaqane & Afrah, 2016; Elliott & Healy, 2001; Kanwar & Sanjeeva, 2022; Schertzer & Schertzer, 2004; Shahsavar & Sudzina, 2017; Tessema, Ready, & Yu, 2012; & Taylor, Ishida, Lim, & Delpechitre, 2017). Researchers have assessed students' satisfaction for many reasons. Most studies have measured levels of student satisfaction to identify the least and most satisfied with departments/colleges' programs and services for self-improvement and accountability reporting (Aldridge & Rowley, 2005; Tessema et al., 2012). Other studies have investigated the extent to which factors such as quality of instruction, major course content, capstone experiences, academic advising, overall college experience, class size of major courses, preparation for graduate school or career, grading in major courses, and course availability affect student satisfaction (Ali et al., 2016; DeShields, Ali, & Erdener, 2005; Karna & Julin, 2015; Martirosyan, 2015; Weerasinghe & Fernando, 2018). Still, other studies have examined the association between student satisfaction and college outcomes such as students' persistence, retention, and graduation (Jamelske, 2009; Martirosyan et al., 2014; Pascarella & Terenzini, 2005). However, the effect of student satisfaction on student performance (GPA) and vice versa has received scant attention, even though student satisfaction is a frequently used construct in college student research. That is, little rigorous research exists on the effect of student satisfaction on performance, and their findings are neither conclusive nor consistent. Therefore, this study examines the extent to which student satisfaction affects student

performance (GPA) and vice versa. While this study draws on previous studies of the satisfaction-performance relationship, it differs from those studies in two important ways. First, this study assesses the reciprocal relationship between satisfaction and performance (GPA) using a large sample size (N=5,185). Second, it includes student characteristics (e.g., ACT scores and average hours worked) into the model to assess their impact on student performance (GPA).

Literature review

Satisfaction is a well-researched topic in both non-academic (workplace) and academic settings. A large body of theoretical literature is devoted to job satisfaction. However, while there have been several studies on job satisfaction, starting with the pioneering work by Hoppock (1935), there is no universally accepted definition of job satisfaction. Hoppock (1935: 38) first defined Job satisfaction as "a combination of psychological, physical, and environmental circumstances that causes a person to say, 'I am satisfied with my job." According to Locke (1976: 1300), job satisfaction is the "pleasurable or positive emotional state resulting from the appraisal of one's job or job experiences." Thus, job satisfaction refers to the degree to which a person likes his/her job.

Regarding satisfaction in an academic setting, researchers have conceptualized student satisfaction in many ways. For example, satisfaction has been conceptualized as satisfaction with 'college experience' (Moro-Egido & Panadés, 2010), 'assessment' (Kane, 2005), 'quality of instruction' (Tessema et al., 2012), 'campus-wide' (Benjamin & Hollings, 1997), 'campus service' (Bryant, 2006), 'the favorability of a student's subjective evaluation of the various outcomes and experiences associated with education' (Elliott & Healy, 2001), and 'performance of an academic department' (Thomas & Galambos, 2004), 'educational service' (Mukhtar, Anwar, Ahmed, & Baloch, 2015). In addition, Danielson (1998) defines satisfaction as the attraction, or positive feeling, that students associate with the institution they are attending, while Weerasinghe, Lalitha, & Fernando (2017) define it as a short-term attitude resulting from an assessment of students' educational experience, services, and facilities.

Student satisfaction appears to be a complex yet poorly articulated notion (DiBiase, 2004). Although there is no consensus on the definition of student satisfaction, its multi-dimensional nature is acknowledged unanimously (Garcia-Aracil, 2009; Roszkowski, 2003; Spătărelu, 2019). In this study, student satisfaction is conceptualized as satisfaction with eleven college-related issues/factors: required course availability for major, quality of instruction, major course content, variety of courses, capstone experiences, academic advising, overall college experience, preparation for career or graduate school, class size of major courses, grading in major courses, and course availability for electives in major. Student satisfaction describes how content a student is with the above college-related issues. Moreover, the above discussion suggests that satisfaction is a complex and multifaceted concept, which can mean different things to different people.

A related question is: How does satisfaction affect performance? Job satisfaction is one type of attitude. According to Robin & Judge (2022), there are three main types of job attitudes: Job satisfaction, job involvement, and organizational commitment. An employee's attitudes, as a principle, predict his/her job-related behavior (Ajzen & Fishbein, 1980). This relationship indicates that satisfaction is one type of attitude that influences our behavior. We form attitudes toward our jobs or different college outcomes by considering our feelings, beliefs, and behaviors.

Satisfied students may start college with a greater commitment to the HEI than unsatisfied students (Ali et al., 2016; Elliott & Healy, 2001; Lapidus & Brown, 1993). Satisfaction may foster goal attainment by providing resources such as optimism and energy that are linked to self-

improvement, effective coping, and recovery following resource-draining acts of self-regulation (Lyubomirsky, King, & Diener, 2005). Satisfied students differ from less satisfied students in how they encode, interpret, and respond successfully to life events and conditions (Lyubomirsky, 2001). Satisfaction is a relevant measure because several studies have demonstrated that, other factors being equal, satisfied individuals are likely to be willing to exert more effort than unsatisfied individuals are (Bryant, 2006; Özgüngör, 2010). Thus, satisfied students are likely to exert more effort, persist in their studies, and graduate by taking actions such as regularly attending their classes, becoming more involved in their assignments, and attending more extracurricular activities than unsatisfied students. These findings suggest that student satisfaction is critical to both students and HEIs (Tessema et al., 2012).

Many theories aim to explain the concept of satisfaction in work settings. Locke's Range of Affect Theory (1976) is the most well-known satisfaction model. The central premise of this theory is that satisfaction is determined by a discrepancy between what an individual wants in a job and what she/he has in a job. Further, the theory assumes that how much an individual values a given aspect of work moderates how satisfied/dissatisfied she/he becomes when expectations are/are not met. When an individual values a particular aspect of a job, their satisfaction is more strongly affected, both positively when expectations are met and negatively when expectations are not met, compared to an individual who does not value that aspect. Locke's theory of satisfaction may suggest that student satisfaction is determined by a discrepancy between what a student wants or expects in college and what she/he receives. When there is a gap between student expectations and reality, the student satisfaction level is likely to decrease/increase.

Interest in the link between job satisfaction and performance dates back to the human relations theory that emerged from the Hawthorne studies, and the issue has been researched to this day. According to Vroom (1964:181), "It was typically assumed by most people associated with the human relations movement that job satisfaction was positively associated with job performance." Human relations might be described as an attempt to increase productivity by satisfying employees' needs. Numerous studies have examined the relationship between satisfaction and performance in work settings. Findings from many studies have been mixed regarding the extent to which job satisfaction leads to higher job performance (Brayfield & Crockett, 1955; Iaffaldano & Muchinsky, 1985; Judge et al., 2001; Katebi et al., 2022; Vroom, 1964). For example, in 1955, Bryfield and Crockett (1955) published the first extensive literature reviews with more than 50 studies, casting serious doubt on the assumption that satisfaction causes performance. Their findings revealed an average correlation of only .15. In 1964, Vroom (1964) reviewed 20 studies and found a very low correlation (.14) between satisfaction and performance (Vroom, 1964). In 1985, Iaffaldano & Muchinsky (1985) reviewed about 200 studies and concluded that the job satisfaction-performance relationship was only weakly manifested (r=.17). In 2001, Judge et al. (2001), using 312 studies (comprehensive meta-analysis), provided the opposite conclusion from that of Vroom (1964) and Iaffaldano and Muchinsky (1985) and concluded that there was a moderate correlation (.30) between overall job satisfaction and job performance. In addition, Katebi et al. (2022), based on 113 articles, concluded that there was a medium, positive, and significant relationship (.34) between overall job satisfaction and job performance. Hence, the literature on the relationship between satisfaction and performance in the workplace is neither conclusive nor consistent.

When it comes to academic settings, studies conducted on the satisfaction-performance relationship have also yielded mixed results. While most of the studies show a small but positive correlation between student satisfaction and student performance (GPA) (Aitken, 1982; Bean &

Bradley, 1986; Braxton et al., 2014; Dhaqane & Afrah, 2016; Knox et al., 1992; Pike, 1991), some other studies found no relationship between student satisfaction and student performance (Bowen & Kilmann, 1975; Hermans et al., 2009). The widely cited study by Bean and Bradley (1986) found that student satisfaction positively and significantly explained changes in students' performance, as measured by GPA (ß=.0208). Based on the above research findings, we propose the following:

H1a: *Students' satisfaction will positively affect students' performance (GPA).*

It is assumed that higher student performance (GPA) may increase students' satisfaction, as a higher GPA is likely to (a) make students feel respected by professors, classmates, and friends; (b) increase students' future employment opportunities; (c) increase students' scholarship opportunities; and (d) increase students' graduate school opportunities. A few studies have assessed the extent to which students' academic performance explains changes in student satisfaction. However, their findings have shown mixed results (Bean & Bradley, 1986; Grayson, 2004; Hermans et al., 2009; Moore, 2018; Pike, 1991). Based on the above research findings, we propose the following:

H2a: *Students' performance (GPA) will positively affect students' satisfaction.*

Effects of Students' Background on Student Performance (College GPA)

If student satisfaction is not a strong predictor of student performance (GPA), the question is: "To what extent do the backgrounds of college students affect their academic performance (college GPA)? College students differ in terms of their past academic performance (e.g., ACT scores), gender, family income, working hours, campus residency status, and first-generation status.

Past Performance (ACT scores)

In differentiating potential candidates in HEIs, colleges and universities use standardized tests such as the ACT score. The ACT, as a college admission tool, has been used since 1959 and is one of the most widely used college admissions tests in the United States (U.S). The test is scored on a scale that ranges from 1 to 36, with 36 as the highest possible composite score for reading, math, science, and English (ACT office, 2024). Students with strong past academic performance tend to do better in college, as past performance is a great predictor of future performance (Judge & Kammeyer-Mueller, 2022; Warren & Goins, 2019; Wilcox & Nordstokke, 2019). Students with higher ACT scores are more likely to have higher college GPAs than students with lower ACT scores (Chee et al., 2005; Tessema, Ready, & Astanie, 2014). Thus, we hypothesize the following:

H3a: *Students' past performance (ACT score) will positively affect students' performance (GPA).*

Student Employment (Working Hours)

While most studies show that student employment has a negative effect on students' academic performance (GPA) (Humphrey, 2006; Andemariam et al., 2015), some studies report

positive effects of student employment on GPA (Kalenkoski & Pabilonia, 2008; Manthei & Gilmore, 2005; Thies, 2023). Based on the above studies, we forward the following hypotheses:
H3b: Student working hours will negatively affect students' performance (GPA).

Gender

In several studies, female students were found to have higher college GPAs than male students (Chee et al., 2005; Russell, Russell, & Lehman, 2008; Tessema et al., 2012), primarily due to greater self-discipline and focus (Sax & Harper, 2005). Put differently, female students tend to demonstrate higher conformity to academic standards in general (Alshammari et al., 2018; Chee et al., 2005; Parahoo, Harvey, & Tamim, 2013). Based on the above studies, the following hypotheses are proposed:

H3c: *The GPAs of female college students will be higher than male college students.*

Family income

Although the classification or definition of family (household) income (low, middle, and higher) varies under different periods, according to the United States Census Bureau (2023), the low-income family refers to those families with income of less than $61,000 annually, middle-income family refers to those families with income of $61,000–$183,000 annually, and higher income family refers to those families with greater than $183,000 annually. Students from higher-income families tend to receive a better education before joining HEIs than students from low-income families (Andemariam et al., 2015; Nunez & Cuccaro-Alamin, 1998). Hence, we hypothesize the following:

H3d: *The GPAs of low-income students will be lower than those who are not from low-income backgrounds.*

Living on campus

College students who live on campus tend to spend more time on campus and have more access to university facilities and resources such as the library, study rooms, or tutorial services than those who live off-campus (Araujo & James, 2010; Brouwer et al., 2022; Hanawi, Saat, Amin, Hanafiah, & Periasamy, 2021). Thus, the following hypotheses are forwarded:

H3e: *The GPAs of students living on campus will be higher than those who do not live on campus.*

First-Generation or Not

First-generation college students are defined as "students whose parents have either not attended college or completed a college degree" (Williams & Butler, 2010, p. 1). First-generation college students are more likely to come from low-income families (Nunez & Cuccaro-Alamin, 1998; Tessema et al., 2017) and to have a weaker educational foundation than students who are not first-generation (Green, 2015). Thus, the following hypotheses are proposed:

H3f: *The GPAs of first-generation students will be lower than those who are not first-generation students.*

RESEARCH DESIGN AND METHODOLOGY

Subjects and procedure

The data on student satisfaction were collected through a survey of university students. The survey was conducted at a U.S. university. The survey was sent to all senior students with 90 or more credit hours. The student satisfaction data set had 6,609 participants. However, only 5,185 usable participants or observations were obtained. The data used in the current study were collected from the five colleges of the university, namely Liberal Arts (28.8%), Health Sciences (20.7%), Business (20.7%), Education (15.1%), and Science (14.4%). In addition, the survey included several demographic factors (e.g., gender and residency status). Data on students' college GPA, ACT scores, race, campus residence (yes or no), family income (low or not), and working hours were extracted from the university's student database and matched to survey responses by the university assessment office. The dataset provided to the researchers did not include identifying numbers or student names.

Measures

The survey encompassed eleven factors affecting student satisfaction. They were overall college experience, required course availability for major, quality of instruction, academic advising, capstone experiences, variety of courses, grading in major courses, major course content, preparation for career or graduate school, class size of major courses, and course availability for electives in major. In assessing the satisfaction of the participants with the above eleven factors, a four-point Likert scale was used - ranging from 1, 'Very dissatisfied,' to 4, 'Very satisfied' (e.g., "How satisfied are you with the quality of instruction," "How satisfied are you with academic advising," and "How satisfied are you with your overall college experience"). This is a forced choice procedure (a bipolar scaling procedure) because the middle choice was unavailable, that is, 'neither satisfied nor dissatisfied'- positive or negative responses to a statement were not provided. Cronbach's Alpha and Confirmatory Factor Analysis were utilized to test the reliability and validity of each variable in the satisfaction scale. While the alpha coefficient for the satisfaction scale was 0.88 (Henson, 2001), the factor loading for satisfaction and GPA was 0.4 (Brown & Moore, 2012).

Results

Table 1 provides descriptive statistics of the respondents' satisfaction levels, GPAs, and backgrounds. Our findings reveal that the average satisfaction level of the respondents was 3.13 (on a four-point Likert scale), the average ACT score was about 23 (ACT score is a continuous variable that is measured on a 1-36 scale), the average college GPA was 3.26 (GPA is a continuous variable that is measured on a 0.0-4.0 scale), the average weekly working hours was about 15.6. Moreover, about 31 percent of the respondents were from low-income families, about 70 percent were female, about 51 percent lived on campus, and about 45 percent were first-generation college students. Regarding race, 91.7 percent of the respondents were White, 1.7 percent were Asian American, 2.1 percent were African American, 1.1 percent were Hispanic, 0.2 percent were American Indian, 0.1 percent were Hawaiian/Pacific Islander, and 3.1 percent represented other international groups.

Table 1:
Descriptive Statistics of the Respondents' Satisfaction Level and Their Backgrounds

No.	Variable	Percent	Average
1	Satisfaction level- Average		3.13
2	ACT scores- Average		23
3	College GPA- Average		3.26
4	Working hours- Average		15.6
6	Family income- Low	31	
7	Lived on campus- Yes	51	
8	Gender- Female	70	
8	Generational status- First	45	

Table 2 presents the results of our regression analysis, which sought to understand the extent to which student satisfaction influences changes in students' performance (GPA). Before conducting the regression analysis, we thoroughly examined the variables for outliers, multicollinearity, and their fit with the regression assumptions. Importantly, this examination revealed no potentially problematic outliers, as Cook's distance consistently remained well below 1.0 for all cases (Tabachnick & Fidell, 2019).

Table 2:Results of Regression Analyses on Student Performance (GPA) [a]

Variables	Model 1 *Standardized Coefficients*	Model 2 *Standardized Coefficients*
Student satisfaction	.13**	.12***
ACT Scores		.34**
Average hours worked		-.13***
R	.13	.37
R^2	.02**	.14**
R^2 change		.14**

NB: [a] *Standardized regression coefficients are reported; *p<.05; **p<.01; ***p<.001; n=5,185.*

In Table 2, regression results depict that satisfaction has a statistically significant positive impact on student performance (ß=.13, R2=.02). This value suggests that as students' satisfaction increases, we expect to see a slight increase in students' performance (i.e., an increase of 0.13 for a 1-unit increase in students' satisfaction). The result further implies that many other factors influence students' performance (GPA).

In Model 2, in Table 2, when the two student backgrounds (ACT score and working hours) were added to the model, the R^2 change was =.14, which is statistically significant (Table 2). The results also show that all variables (student satisfaction, ACT scores, and average hours worked) influenced GPA significantly. As shown in Model 2, the combined variables explain 14 percent of the variation in student performance (GPA) (R^2=.14). Out of the three variables, the ACT was found to be a strong predictor of students' performance (GPA) (ß=.34). Moreover, the average

hours worked, measured as a continuous variable (actual hours worked per week), by students were also found to be a significant predictor of GPA (ß= -.13) indicating that the more students worked, the less time was available for them to study. Often, working is due to financial hardship and necessity. This adds to the stress and negatively affects productivity even when they are available to study. Hence, hypotheses 1, 2, 3a, and 3b are supported.

Table 3:
Effects of Students' Background on GPA and t-test Results

Variable		Mean	SD	**t**	**df**	**Sig.**
Gender	Female	3.37	.42	-16.45	5183	**000**
	Male	3.13	.48			
Family income	Low income	3.21	.41	3.65	5174	**0.027**
	Non-low income	3.32	.47			
Lived on campus	Yes	3.31	.43	2.19	5152	**0.036**
	No	3.22	.45			
Generation status	First	3.22	.62	.73	5165	0.468
	Non-first	3.24	.57			

Table 2 reveals the T-test results of four students' characteristics. Except for generation status, it shows statistically significant differences. For example, gender substantially impacts college GPA (t_{5183}=-16.45, p<.001). While the average college GPA for females was 3.37, the average college GPA for males was 3.13. One possible explanation is that female students tend to be more self-disciplined than their male counterparts. It also indicates that family income significantly affects student GPAs in that students from low family incomes had lower GPAs (3.21) than those with non-low incomes (3.32). Students from low-income families have lower resources, such as books, hardware, software, and technology (iPads, laptops), and space to study without distraction. These students tend to work to support their families or meet their expenses, and often take up additional responsibilities such as caring for younger siblings. All these factors affect GPA negatively. Moreover, students who lived on campus (3.31) had higher GPAs than their counterparts- those who did not live on campus (3.22). The campus provides access to many learning resources and support services (e.g., computers, hardware & software, laptops to rent, books to review in the library, and a quiet place to study without distraction). Many universities and colleges offer support services such as tutoring, assistance from teaching assistants (TAs), easy access to professors during office hours or by appointment, a learning disability center, and frequent opportunities to participate in academic student organization activities and events. Thus, hypotheses 3c, 3d, and 3e are supported.

Since the effect of student satisfaction on student academic performance (GPA) is very small, we also wanted to see the effect of performance on student satisfaction. For that end, we run a regression analysis on student satisfaction. The results of the regression reveal that students' performance (GPA) is found to have a statistically significant positive impact on students' satisfaction (ß=.08). This value suggests that as GPA increases, we expect to see a slight increase in students' satisfaction (i.e., an increase of 0.08 for a 1-unit increase in GPA). The current study shows that satisfaction exerts a stronger influence on students' performance than students' performance does on satisfaction.

Table 4:
Results of Regression Analyses on Student Satisfaction[a]

Variables	*Standardized Coefficients*
Student performance (GPA)	.08*
R	.08*
R^2	.01*

NB: [a] Standardized regression coefficients are reported; * p<.05; n=5,185.

DISCUSSION

In testing the proposed hypotheses, we conducted regression analyses and t-tests (Tables 2, 3 & 4). The regression analysis results in Table 2 show that student satisfaction positively and significantly explained the change in student performance (GPA) (ß=.13, R^2=0.02). The findings also suggest that the effect of student satisfaction on GPA is small. The regression result provides only a limited explanation of variation in student performance (GPA).

This study contends that although the effect of student satisfaction on GPA is statistically significant, practically, the effect is weak. Of course, this result may not indicate that high student satisfaction causes high GPAs or that high dissatisfaction causes low GPAs. Therefore, the perceived effect of student satisfaction on performance that we logically or intuitively think may not be correct. Performance is not the direct result of any one factor, such as satisfaction. Thus, the current study does not strongly support many theories and models on the effect of satisfaction on performance (GPA) and calls into question the causal ordering of many of the models used to explain the student satisfaction-performance relationship.

One possible explanation is that many other factors influence student performance (GPA), such as ACT score and average hours worked. Thus, this study indicates that satisfaction does not necessarily contribute directly to GPA. The result contradicts the widely accepted assumption that satisfaction leads to higher performance. The findings of the current study are in line with some studies (e.g., Aitken 1982; Bean & Bradley, 1986; Braxton et al., 2014; Dhaqane & Afrah, 2016; Hermans et al., 2009; Pike, 1991).

As shown in Table 2, Model 2, when the two student characteristics were added to the model, the R2 that we found was (R2=.14). This finding indicates that the three variables altogether have a significant effect on student performance (GPA). However, past performance (ACT scores) is a strong predictor of students' performance (college GPA) (ß=.34). This finding supports the suggestion by Judge & Kammeyer-Mueller (2022) that past performance is a good indicator of future performance. Thus, past performance has strong predictive power.

Table 3 discloses the results of t-tests. The findings reveal that except for first-generation status, the three student background variables (gender, family income, and campus residency status) statistically impact GPA indicating that female students had more GPAs than male students; students from low-income families had higher GPAs than students from non-low-income families; and students who resided on campus had higher GPAs than those who did not live on campus. The above findings align with previous studies (e.g., Andemariam et al., 2015; Russell et al., 2008; Tessema et al., 2012; Whipple & Dimitrova-Grajzl, 2021).

Although this study shows a weak effect of students' satisfaction on GPA, many studies argue that highly satisfied students are more likely to remain in, and ultimately, successfully

graduate from college (e.g., Bryant & Bodfish, 2004; Dhaqane & Afrah, 2016; Martirosyan et al, 2014; Pascarella & Terenzini, 2005; Tinto, 1987). Furthermore, some studies depict that student satisfaction is inversely related to student complaints regarding advising and career preparation (e.g., Korn, Sweetman, & Nodine, 1996).

If student satisfaction does not adequately explain the change in student performance (GPA), does GPA explain satisfaction? The regression results in Table 4 reveal that student performance (GPA) positively and significantly explained the change in student satisfaction (ß = 0.08). However, the effect of student performance on student satisfaction is relatively small. The finding of this study also shows that student satisfaction has a greater influence on student performance than student performance has on student satisfaction, in that the effect of student satisfaction on student performance (GPA) (ß=.13) was about one and a half times the size of the effect of student performance (GPA) on student satisfaction (ß=0.08).

IMPLICATIONS, CONCLUSIONS, AND FURTHER RESEARCH DIRECTIONS

This study revealed that student satisfaction positively and significantly impacts student performance (GPA), although the impact was weak. A weak relationship between student satisfaction and performance (GPA) may suggest that satisfied students are not necessarily those with higher academic performance (GPA). However, a weak relationship between satisfaction and performance may not indicate that student satisfaction is unimportant for colleges and universities. Prior studies show that student satisfaction plays a crucial role in affecting other students' college outcomes, such as retention (turnover intention), graduation rate, commitment to college, and student complaints. In the competitive market, satisfaction with services may make the difference in students' selection of HEIs and maintaining sufficient funding from state legislatures for public institutions (Brouwer et al., 2022; Schreiner, 2009; Shahsavar & Sudzina, 2017; Tinto, 1997; Wintre & Bowers, 2007). Hence, despite a weak satisfaction-performance relationship, HEIs should strive to improve student satisfaction, as it affects other college outcomes. Low satisfaction levels signal potential problems and behavior. It is generally believed that negative attitudes can lead to withdrawal behaviors.

It could be argued that although students' satisfaction cannot guarantee higher GPAs, its absence (lower students' satisfaction) can adversely affect college GPAs and other students' college outcomes. This further suggests that although students' satisfaction plays a vital role in positively impacting their college outcomes, it should not be perceived as the sole factor affecting student performance or college outcomes. Instead, satisfaction is only one factor of diverse influences that determine student performance level (GPA).

In this study, past performance (ACT score) was the most important predictor of college students' academic performance (GPA). Thus, the assumption that past performance is a good indicator of future performance is strongly supported by our findings, i.e., having a good past performance record (ACT score) is likely to lead to higher student performance (college GPA). One implication for high school students is that to complete college with a higher GPA, they need to work hard to improve their ACT scores.

This study also shows a link between students' satisfaction and performance (GPA) in both directions, but with weak intensity. An interesting finding of the current study is that the effect of students' satisfaction on performance (GPA) is stronger than that of students' performance (GPA)

on satisfaction. It could be stated that students' satisfaction determines their performance (GPA) rather than their performance (GPA) determining satisfaction.

This study extends previous research on the satisfaction-performance relationship by examining college students' satisfaction and academic performance (GPA). Unlike most previous research, this study used a large sample size (n=5,185). It also included two student characteristics in the model: ACT scores and average hours worked. Unlike most previous studies, this study determined not only the extent to which student satisfaction affects student performance, but also the extent to which student performance affects student satisfaction, using a large sample size. Since the effect of student satisfaction on student performance is very small, this study includes many students' background variables in the model and examines their impact on students' performance. It uses individual-level data to test an individual-level model. It uses multiple sources of information to measure the various constructs, reducing the problem of standard method and source bias. This study sheds new light on the determinants of student performance (GPA) and provides insights vital for both researchers in this domain and HEIs.

Despite its contribution, this study has limitations and leaves some questions open for future research. First, like any empirical study of complex behavioral issues, this study is subject to several cautions. Second, this study was based on data derived from a single U.S. university, and students responding to this survey were predominantly Caucasian (about 92%), which may not reflect the reality of a nationally representative sample of students. Hence, to generalize and validate the findings of this study, we suggest conducting a similar study with a broader, larger sample and a less homogeneous ethnic distribution. Third, this study uses cross-sectional data, limiting its ability to control unobserved effects fully. Students' satisfaction is based on students' self-reporting and is not an objective indicator. Although this is a limitation, a substantial body of research indicates that self-reports are acceptable for measuring student satisfaction (DiBiase, 2004; Garcia-Aracil, 2009).

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Submitted: 19 June 2024
Revised: 18 May 2025

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