



The role of perceived cost in college students' motivational experiences and long-term achievement outcomes: A mixed-methods approach[☆]

Sarah H. Wu, Jennifer Henderlong Corpus^{*}

Department of Psychology, Reed College, 3203 SE Woodstock Blvd, Portland, OR 97202, USA

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ABSTRACT

A growing body of research suggests that perceived cost, the largely neglected component of Expectancy-Value Theory, is an important predictor of achievement outcomes. However, existing studies in the cost literature focus almost exclusively on STEM domains, use short-term measures of academic outcomes, and typically rely on quantitative reports of students' cost perceptions. The present study applied a mixed-methods approach to 1) document the relationship between first-year college students' domain-general cost perceptions and their longer-term academic outcomes, and 2) characterize the motivational experiences of students with high versus low quantitative reports of cost. 298 students completed a domain-general survey measure of perceived cost near the end of their first semester of college, and a subset ($n = 185$) later responded to open-ended prompts reflecting on times of low and high motivation during their first year. Grades and enrollment status were tracked for the remainder of their time at the institution. Consistent with prior research, cost negatively predicted GPA and retention status both during the first year and for the duration of students' enrollment at the institution. Qualitative analysis produced multiple themes that differentiated "High Cost" students from their "Low Cost" peers, in that they focused on self-regulation as opposed to deep understanding, expressed concern about incompetence and failure, and prioritized non-academic activities. Taken together, these findings suggest that cost is a prominent aspect of the collegiate experience, and that initial cost perceptions can serve a catalyst for—or a barrier to—future academic success.

1. Introduction

The first year of college is a time of tremendous change: In addition to adjusting to social life, a new living environment, and greater responsibilities, students must take on more demanding classes and make impactful decisions about their major. During this academic transition, one common struggle for students is navigating the costs associated with their coursework. When deciding how much time and effort to invest in their studies, students may consider questions such as: Do I study or hang out with my dorm friends? Should I allocate my limited energy to my problem set or my humanities paper? Is this class worth the stress it causes me, or should I drop it?

It is important to consider what is at stake as students engage in these types of cost-benefit analyses on a daily basis. The present study investigated the *perceived costs* of students' academic work during the first semester of college—a period when students form motivational beliefs

that may have implications for achievement outcomes throughout their higher education experience. We used a domain-general lens to examine the extent to which the perceived costs of academic work early in students' college careers predicted their longer-term achievement and retention. Moreover, we used mixed methods to provide a nuanced understanding of how motivational experiences differ for students with varying perceptions of cost.

1.1. Cost in the context of expectancy-value theory

Expectancy-Value Theory (EVT) has been a dominant framework in the study of motivation for the past 40 years, and it attempts to capture the key components that motivate a range of achievement-related behaviors (Eccles (Parsons) et al., 1983; Wigfield & Eccles, 2000). The theory posits that a person's *expectancy* of success at a task and the *value* they associate with it influence their overall motivation to engage in the

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^{*} Corresponding author.

E-mail address: henderlj@reed.edu (J.H. Corpus).

task. The value component of EVT consists of the perceived benefits of task engagement (i.e., intrinsic value, attainment value, utility value), as well as the *cost*, or perceived downsides of task engagement. The dimensions of cost vary slightly across researchers' conceptualizations, but most commonly include *effort cost* (the perceived effort required and whether such effort feels worthwhile), *opportunity cost* (the extent to which one must give up other activities to engage in the task), and *psychological cost* (the experience of negative emotions during task engagement or resulting from task outcomes; see Eccles & Wigfield, 2020).

Although cost has been part of EVT from the beginning, researchers have only recently fully operationalized the construct and probed its contributions to the model. This work affirms that cost is an important and unique component of EVT. Cost can be empirically distinguished from both expectancies and the other aspects of task value, and it predicts variance in meaningful outcomes above and beyond these other dimensions of the model (e.g., Barron & Hulleman, 2015; Jiang et al., 2018; Perez et al., 2014; Robinson et al., 2019). For example, in a study on Korean middle school students' perceived costs of mathematics, Jiang et al. (2020) verified that cost was empirically distinct from all components of value, and was uniquely predictive of maladaptive academic outcomes like test anxiety and disorganization. Based on this body of evidence, some scholars have argued that cost is best conceptualized as a third factor in an expectancy-value-cost model of motivation, rather than the negative facet of subjective task value (Barron & Hulleman, 2015). While this continues to be an active debate, a recent study by Part et al. (2020) supported the original conceptualization of EVT by showing that the best-fitting model for subjective task value was a bifactor model that included both values and costs. A recent theoretical paper from the founders of the theory also favored the more parsimonious view of cost as an aspect of task value (Eccles & Wigfield, 2020).

1.2. The implications of cost

Notwithstanding this debate, high perceived costs have been shown to predict a number of adverse academic outcomes across educational stages. Among secondary school students, cost negatively predicts students' academic achievement (Gaspard et al., 2017; Jiang et al., 2018), and positively predicts procrastination and the adoption of avoidance goals (Jiang et al., 2018). At the college level, in addition to its associations with poor academic achievement (Benden & Lauermann, 2022; Robinson et al., 2019) and procrastination (Kim et al., 2021), cost is associated with intentions to drop out (Schnettler et al., 2020). Effort cost specifically has been shown to significantly negatively predict retention in STEM majors (Perez et al., 2014; Robinson et al., 2019). Unfortunately, perceived cost may increase over the course of the first two years of college, at least for STEM students (Robinson et al., 2019)—a sobering pattern consistent with other research on motivational change in college students (Busse & Walter, 2013; Corpus et al., 2020; Pan & Gauvain, 2012).

Although cost is a clear predictor of motivation and achievement in college, the extant literature has largely focused on STEM subjects (e.g., Benden & Lauermann, 2022; Kim et al., 2021; Part et al., 2020; Perez et al., 2014; Robinson et al., 2019). These studies provide insights about motivation that are both theoretically and practically important given the notoriously leaky STEM pipeline. At the same time, STEM domains may be costly in unique ways: They are often perceived to be quite difficult, incompatible with work-life balance, and unwelcoming to minoritized groups (see Eccles & Wang, 2016; Rainey et al., 2018). It is unclear if more domain-general perceptions of cost function in the same way. Indeed, other factors may loom large when considering the costs of college attendance more broadly. Students may feel the drain of time spent meeting general college requirements or experience uncertainty over the return on their educational investment. What is the impact of these more domain-general perceptions of cost associated with studying

or attending college (i.e., beyond the specific areas of STEM)? This important question may have implications for overall performance and persistence in obtaining a college degree, which to our knowledge has not yet been examined empirically.

The current focus of the literature on STEM domains, moreover, only speaks to retention in a single course or major. Benden and Lauermann (2022), for instance, assessed physics and math students' motivation throughout a semester, and used cost perceptions to predict course dropout for that one semester. Other researchers have measured self-reported *intentions* to leave a major rather than tracking behavioral patterns (e.g., Hong & Bernacki, 2022; Perez et al., 2014). Knowing the relationship between domain-general cost perceptions and longer-term retention outcomes assessed behaviorally (e.g., college graduation) would be beneficial for understanding the potentially far-reaching implications of cost, not just its predictive value within a narrow time frame for specific academic domains.

Therefore, we used a domain-general approach to examine perceived costs during the first semester of college. We considered the extent to which general measures of cost assessed early in students' college careers might predict not only short-term but also long-term performance and retention. We hypothesized that domain-general cost perceptions during students' first semester of college would negatively predict both GPA and retention well beyond the first year.

1.3. A mixed-methods approach

Notably, the vast majority of research on cost has measured it quantitatively: Students typically rate their agreement with various cost perception statements on a Likert scale, and researchers analyze the associations between those cost reports and academic outcomes (e.g., Jiang et al., 2018; Perez et al., 2019). Some studies have taken the quantitative analysis further, analyzing how the *change* in students' cost perceptions over a given time period may be linked with certain academic outcomes (Dietrich et al., 2019; Hong & Bernacki, 2022; Robinson et al., 2019). This body of work has powerfully documented the correlates of cost in large samples that contribute to external validity (e.g., Jiang et al., 2018; Perez et al., 2019). Although valuable and nuanced, these quantitative studies fail to capture whether cost is salient enough to students that they would spontaneously report it on their own, unprompted by Likert-scale items. Moreover, a strictly quantitative approach may not fully represent the richness and complexity of students' broader experiences of school, and how such experiences may differ as a function of perceived cost.

Qualitative methods allow for a richer understanding of these experiences, but they are relatively rare in the cost literature. Some qualitative research has been used for validation purposes—to determine if students' experiences of cost converged with researchers' conceptualizations of the construct. Flake et al. (2015) conducted focus groups with college students, prompting them to think of classes in which they were least and most motivated, and coded students' descriptions for evidence of the dimensions of cost. Students did indeed perceive their coursework to have effort, opportunity, and psychological costs, validating these as meaningful dimensions of the cost construct. Johnson and Safavian (2016) also conducted focus groups in order to identify and confirm cost concepts that students perceived, prompting them with open-ended questions such as, "What kinds of 'costs' do you think there are when it comes to education?" Participants' responses generally converged with the quantitatively-derived dimensions of cost, but, importantly, also indicated that students could persist and stay academically engaged if they believed those costs were worth the reward. These qualitative analyses both validated the cost construct and revealed novel, unanticipated cost concepts, such as the social cost of judgment from other students (Johnson & Safavian, 2016).

The present study aimed to address gaps in the existing research on cost by utilizing a mixed-methods design that *integrates* quantitative and qualitative approaches (Creswell & Plano Clark, 2010; Johnson &

Onwuegbuzie, 2004; Plano Clark, 2019). This approach allows for a more comprehensive understanding of cost through two different avenues of triangulation. First, qualitative data can be used to validate the conclusions drawn from quantitative analyses. If cost perceptions negatively predict students' performance and retention, do students reporting high cost on survey measures also report experiences around poor academic performance or uncertainty of degree completion in open-ended reports? Such convergence can counteract limitations and biases specific to each individual method (e.g., the subjective nature of qualitative analysis, Fulmer & Frijters, 2009; McCrudden et al., 2019). Beymer, Ponnock and Rosenzweig (2022) demonstrated this advantage of a mixed-methods approach when studying the perceived costs of teachers. Participants were asked to rate the extent to which they experienced each dimension of cost (quantitative data) and describe what they felt were the most challenging aspects of teaching (qualitative data). The quantitative and qualitative data converged: Teachers in the highest tertile for emotional cost, for example, were most likely to describe the difficulty of dealing with students with unsupportive home lives.

Second, qualitative data can be used to provide a richer and more complex picture of the patterns identified in quantitative analyses, often by spotlighting individual students' constructions of their experiences (Fulmer & Frijters, 2009). For example, in Getty et al.'s (2021) application of EVT for instructors' motivational planning, students were asked to list specific factors that increased or decreased their motivation in a particular course. Responses were then coded for themes of expectancy, value, and cost. Importantly, these qualitative data contextualized students' quantitative ratings of EVT constructs by giving instructors concrete examples of situations in which they occurred. Beyond knowing merely that a particular course had a high average cost score, instructors could see that this manifested as the inordinate amount of time students felt they needed to sacrifice to complete the course assignments well. However, Getty et al. specifically coded for the components of EVT and regarded responses that did not clearly fall in those categories as non-codable. As a result, themes could not be structured around unanticipated concepts generated by students themselves.

In the present study, we used an inclusive coding approach to examine students' open-ended accounts of their motivational experiences (qualitative) as a function of their perceived cost as reported on survey measures (quantitative). We asked: What experiences are particularly motivating and unmotivating for students who perceive high versus low levels of cost? We expected the qualitative data to provide insight that would verify, inform, or complement quantitative findings about the nature of cost and how it relates to academic motivation and performance. In summary, then, we addressed two key research questions: (1) How do students' domain-general perceptions of cost early in their college experience predict longer-term academic outcomes? (2) How do motivational experiences in the first year of college differ for students with varying perceptions of cost?

2. Method

2.1. Participants

Data were drawn from the Fall 2016 and Fall 2017 cohorts of the Academic Perceptions Study, a larger longitudinal study that enrolled students during first-year orientation and assessed their motivational

beliefs several times during the first year of college ($n = 508$; see Corpus et al., 2020).¹ All students in the sample attended a liberal arts college, which provided an appropriate context for examining domain-general perceptions of cost. In the present study, we focused on those students who participated in a survey at Week 14 of the fall semester ($n = 327$), when their perceptions of cost would be reasonably well-established. We then narrowed the sample for quantitative analysis by including only those students who gave consent for release of their institutional records regarding performance and enrollment ($n = 298$). Of these participants, 50% identified as female, 45% as male, 3% as non-binary, and 2% as other or prefer not to respond. The racial/ethnic distribution of the sample was 64.9% White, 17.7% Asian American/Pacific Islander, 9.4% Hispanic/Latinx, 3.4% other, 3.1% Black/African American, and 1.1% Native American.

The starting point for the qualitative portion of the study was the subset of students from the quantitative phase who provided open-ended responses regarding their experiences of motivation at Week 14 of the spring semester, in addition to the aforementioned quantitative reports of cost ($n = 213$). As explained in Section 3.2, we dropped 28 students who were exactly at the median for the cost composite to create the final analytic sample of 185 participants. There were no differences in cost perceptions between students in this qualitative analytic sample ($M = 3.09$, $SD = 1.18$) and those who were only included in the quantitative analysis ($M = 3.06$, $SD = 1.05$), $t(289) = 0.23$, $p = .82$. Of the participants in the qualitative analytic sample, 54% identified as female, 42% as male, and 4% as non-binary. The racial/ethnic distribution of the sample was 64% White, 15.6% Asian American/Pacific Islander, 11.1% Hispanic/Latinx, 4% Black/African American, 3.6% other, and 1.3% Native American.

2.2. Measures

2.2.1. Quantitative reports of cost

Using the four cost items from the brief, 10-item Expectancy-Value-Cost Scale (Kosovich et al., 2015), students rated their agreement with four statements about domain-general academic cost perceptions on a 6-point scale (1 = *strongly disagree*, 6 = *strongly agree*). Effort cost was reflected in three items (Item 1: "My coursework requires too much time"; Item 2: "Because of other things that I do, I don't have time to put into my coursework"; Item 3: "I'm unable to put in the time needed to do well in my courses."). Opportunity cost was reflected in one item (Item 4: "I have to give up too much to do well in my courses"). We averaged each participant's responses to the four cost items to create composite cost scores, as an index of their overall perceived cost at Week 14 of the fall semester ($\alpha = 0.83$). In the case of two participants who did not respond to one of the cost items, we averaged the three completed cost items to create composite scores.

2.2.2. Descriptions of motivational extremes

Students' experiences of motivational extremes were assessed with two open-ended prompts (*Time Unmotivated*, *Time Motivated*). Each prompt asked participants to provide context for the times they were least and most academically motivated, respectively, and to explain the reasons for their level of motivation: "Think of a time this year you felt [totally unmotivated/especially motivated] with respect to your academic work. Please describe the context. [Why do you think you were so unmotivated/What led you to be so motivated]?" Participants were able to write responses of any length to describe their experiences.

¹ The Academic Perceptions Study was approved by the Institutional Review Board at the authors' institution. Research using this same dataset has focused on changes in intrinsic and extrinsic forms of motivation over the first year of college (see Corpus, Robinson, & Liu, 2022; Corpus et al., 2020). Neither the quantitative data on cost nor the qualitative data on students' experiences of motivation have been reported on previously.

2.2.3. Academic achievement and retention

With participants' consent, academic achievement and retention data were obtained from the college's registrar. Academic achievement was indexed by first-year GPA and cumulative college GPA, measured on a four-point scale. Cumulative GPA represented an average of each student's GPA for all semesters they attended the institution. Although the majority of participants ($n = 228$, approximately 75%) were enrolled for exactly eight semesters, the number of semesters of enrollment across the sample ranged from one to nine because some students took leaves of absence or dropped out. Long-term retention was assessed by enrollment in the fall of sophomore year, as well as college graduation as of Spring 2021 (i.e., within five years for the 2016 cohort and within four years for the 2017 cohort²).

2.2.4. Prior achievement

In line with previous studies (Perez et al., 2014; Robinson et al., 2019), we controlled for prior achievement in our quantitative analysis. Given standardized tests' long history as a significant predictor of college performance, we indexed students' prior achievement by their ACT scores, or—if the student did not take the ACT—SAT scores that had been converted to the ACT scale.

2.3. Analytic approach

Using an explanatory sequential approach (Plano Clark, 2019), we started with the quantitative phase of the study and then turned to the qualitative phase in order to both validate and deepen understanding of the quantitative findings. For the quantitative component, we conducted pre-registered regressions (documented on [AsPredicted](#)) to examine the relationships between students' quantitative cost reports during the first semester of college and their subsequent academic performance—a replication and extension of previous research on cost in collegiate samples. To integrate the quantitative and qualitative data, we categorized students as “High Cost” or “Low Cost” based on a median split of their quantitative cost reports. We then conducted thematic analysis on students' qualitative reports of their motivational experiences (Braun & Clarke, 2012).

The process of thematic analysis began with reading through all of the open-ended responses while blind to participants' cost status. We generated an initial set of codes using both inductive (“bottom-up”) and deductive (“top-down”) approaches to categorize participants' descriptions of their motivational extremes. The inductive approach involved identifying patterns in the data based on elements that seemed notable regardless of whether or not they had resonance in the motivational literature. The deductive approach, meanwhile, was informed by concepts from motivation research (e.g., self-efficacy, interest, helplessness, autonomy, school climate, etc.) that captured salient commonalities among responses. We then discussed and fine-tuned the initial coding scheme by testing it out on a subset of the responses (approximately 20% of the total dataset). Throughout this process, we considered areas of overlap between codes and clarified their definitions to ensure that each code captured distinct sentiments in the data. See [Table 1](#) for the list of codes and their definitions.

In order to establish reliability, the two authors independently coded 30 randomly-selected cases, none of which had been considered when fine-tuning the coding scheme. We resolved disagreements through discussion. There was strong agreement between authors as indicated by both percent agreement (96%, range: 83%–100%) and kappa (0.86, range: 0.65–1). The first author then coded all of the responses in the

² To account for the possibility that students graduated in more than the default four years because of study abroad programs or short-term leaves of absence, we decided to define college graduation in terms of graduation within five years. However, the 2017 cohort matriculated too recently for the registrar to make available the data on their five-year graduation rate.

Table 1

Codes for descriptions of time unmotivated and time motivated.

| Code | Definition | Sample Quote |
|--|--|---|
| Time Unmotivated | | |
| Too Much Work | Feeling overwhelmed by copious amounts of schoolwork | “The amount of work they ask me to put into that class isn't worth the reward.” |
| Course is Unfulfilling | Lack of interest or engagement in a course, due to the nature of the subject or the assignments (e.g., too challenging, tedious, irrelevant) | “I wasn't interested in the material, and that made it difficult for me to devote time to.” |
| Subcode: Dislike of Tedious Assignments | Frustration or boredom with assignments that are not intellectually stimulating | “The class gave me no intellectual stimulation whatsoever. All I had to do was memorize theorems and examples.” |
| Subcode: Dislike of Challenging Material | Frustration with course material that seems excessively challenging | “I'm not a stem major and I'm really not all that strong in science and math, so I felt very unmotivated immediately when the class started because I thought that I was never gonna be able to get it.” |
| Mental Health or Personal Problems | Mental health conditions or personal problems that interfere with academic performance | “I frequently had thoughts of self-harm and suicide, so naturally I became a little less interested in schoolwork. I tried to push through it as much as I could, but it was incredibly difficult.” |
| Non-academic Priorities | External factors (extracurriculars, friends, good weather) that take priority over academics | “I felt unmotivated during the occupation of [administrative building] because doing readings seemed less important than what was going on campus.” |
| Poor Professor/Learning Environment | Unreasonable or unhelpful professor and/or course environment that is not conducive to student's learning | “The professor didn't allow room for students to think and it felt more like memorizing the professor's analysis rather than coming to my own conclusions. It wasn't taught well and her suggestions for improvement were always surface level or contradicted comments she had made before...” |
| Feeling Drained | Feelings of burnout and exhaustion, typically before a break | “I got very burned out a few weeks ago because I really needed a break...” |
| Feeling Incompetent or Hopeless | Feeling confused in a course, with no hope for improvement | “At a certain point in the year, I realized it was too late for me to understand the tougher math concepts and catch up to the rest of the course, and that was really unmotivating.” |
| Time Motivated | | |
| Mastery/Competence | Desire to do well and understand the material at a deep level; feeling motivated by academic success or a sense of accomplishment | “I received a chemistry problem set and midterm back and the scores I got on both were great. The scores themselves were not what made me happy but they were reflective of me truly knowing the material...” |
| Subcode: Deep Understanding | Desire to master course content; engagement with material | “I was writing a [humanities] paper and really went the extra mile to do research and formulate complex questions.” |

(continued on next page)

Table 1 (continued)

| Code | Definition | Sample Quote |
|---|---|---|
| Subcode: Self-Regulation | Satisfaction with one's time management or organizational skills | "I was motivated because I had my life together- every aspect of my life was organized, under control, and I had a positive perspective." |
| Autonomous Motivation | A course or topic is inherently interesting, meaningful, or valuable | "Writing [humanities] or English essays, or going to classes and discussing those texts. I really loved the material and the discussions. This was basically the entire year." |
| Effective Professor | A particular professor is inspiring and supportive | "I was motivated to improve on my essay writing. My teacher motivated me because she knew I could write an awesome essay and gave me great advice." |
| Balance, Hopefulness, and Mental Wellness | Feeling refreshed after a break, and ready to tackle academics; mental health is in a good state | "I went camping just before reading week and being away from everyone put my time at [college] into perspective...Having a break to be introspective helped me be motivated to finish the year strong." |
| Time Pressure/Poor Performance | Motivated by academic failure/fear of failure, impending deadlines | "There was no particular time when I felt terribly motivated to do anything. The only exception to this was when I had to prepare for chemistry midterms, out of fear that I would do poorly in those exams." |
| Controlled Motivation | Motivated by feelings of guilt, shame, or pressure; desire to prove academic abilities to oneself or others; fear of looking stupid | "...what lead me to be motivated was impostor syndrome and fear that my professors [sic]/peers would judge me if I did something foolish/uncollegelike/obvious...I had this fear all the time" |
| Peers | Feeling motivated by a connection to peers | "...when we had group work as this was an opportunity to learn from one another" |

analytic sample using the coding scheme, while blind to participants' cost status.

Following Braun and Clarke's (2006, 2012) guidelines, we searched for potential themes in the open-ended data. To do so, we unblinded ourselves to participants' cost status, reread quotes that corresponded to each of our codes, and sought broader patterns in the data that seemed to characterize each of the groups. This was an iterative process, in which we expanded, discarded, or otherwise modified our themes in an attempt to capture meaningful commonalities and distinctions between our predetermined groups of participants. When a single code (e.g., *Mastery/Competence*) seemed to capture disparate ideas expressed by High and Low Cost students, we developed subcodes to capture differences between the cost groups. We then returned to the responses that had received the overarching code in order to quantify the presence or absence of the subcodes (see Section 3.2).

In contrast to quantitative analyses, in which the data are analyzed before the results are documented in a report, when conducting a thematic analysis the act of writing about the data is part of obtaining the "results." Thus, as we wrote explanations for our themes, we simultaneously refined them until the themes were distinct and collectively provided a holistic depiction of the open-ended responses. During this stage, we analyzed negative cases (Creswell, 1998) to revise our themes in light of responses that disconfirmed our initial interpretations. Once we solidified our themes, we named each one to convey its central

meaning, selected quotes from the responses that best illustrated the themes, and described the unique contribution of each theme.

Critically, the qualitative portion of the study was validated through multiple processes (Twining et al., 2017). First, the present study involved method triangulation—the corroboration of findings between the quantitative and qualitative data. Second, the dataset allowed for data triangulation, as it includes participants from two cohorts of students matriculating in different years. Third, the present study involved member-checking (Creswell, 1998), since the authors are members of the study population and could therefore attest to the credibility of the data.

3. Results

3.1. Quantitative analyses

As shown in Table 2, there was very little missing data. All cases with data available for a given analysis were included (i.e., pairwise deletion). Prior to hypothesis testing, we examined bivariate relationships between perceived cost and the indices of achievement and retention, as shown in Table 2. Patterns of relationships were as expected, with the cost composite negatively correlated with all measures of both GPA and retention. Because of the multidimensionality of the cost construct, we also considered the correlations between the four individual cost items and the other analyzed variables. Consistent with prior research (Perez et al., 2014), two of the three items assessing effort cost were more strongly correlated with achievement outcomes than the item assessing opportunity cost. As expected, ACT scores were significantly correlated with GPA, which corroborated our decision to control for prior achievement in the regression analysis predicting college GPA.

We conducted our preregistered linear and logistic regressions with composite cost scores as a predictor of GPA and retention, respectively. In order to test the first hypothesis that cost would negatively predict academic achievement, we used two linear regression models (for first-year and cumulative GPA) with composite cost scores as the predictor variable and standardized test scores as a covariate. The linear regression models accounted for significant variance in both first-year GPA, $F(2, 285) = 13.03, p < .001, R^2 = 0.08$, and cumulative GPA, $F(2, 286) = 12.85, p < .001, R^2 = 0.08$. As predicted, cost scores were a significant negative predictor of both first-year GPA ($\beta = -0.18, p = .002$) and cumulative GPA ($\beta = -0.21, p < .001$), after controlling for standardized test scores. Consistent with its reputation as a predictor of college readiness, standardized test scores also significantly positively predicted academic achievement (first-year GPA: $\beta = 0.21, p < .001$; cumulative GPA: $\beta = 0.17, p = .004$).

After pre-registering and conducting the above analyses, we realized that the negative effect of cost on cumulative GPA may have been driven primarily by students who performed extremely poorly in their first year and left the institution. Indeed, the number of semesters of enrollment was positively and substantially correlated with cumulative GPA, $r(294) = 0.47, p < .001$, and negatively correlated with cost, $r(289) = -0.24, p < .001$. We therefore conducted a subsequent, exploratory analysis in which we regressed cumulative GPA on perceived cost, controlling for both standardized test scores and the number of semesters a student attended the institution. The overall model accounted for significant variance in students' cumulative GPA, $F(3, 285) = 30.83, p < .001, R^2 = 0.25$. The number of semesters enrolled was indeed a positive predictor of cumulative GPA ($\beta = 0.42, p < .001$). Importantly, cost predicted unique variance in students' cumulative GPA ($\beta = -0.12, p = .03$), indicating that students' first-year beliefs have implications for their longer-term performance at the institution, whether that lasts only a few semesters or for the duration of college.

Turning to retention status, descriptive analyses showed that the vast majority of students in the sample (88%) returned to the institution for the fall semester of sophomore year. Approximately three-fourths of the original sample (77%) graduated from the institution within five years.

Table 2
Descriptive statistics and correlations.

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|------------------------------|----------|----------|----------|----------|----------|---------|---------|----------|----------|-------|------|
| GPA | | | | | | | | | | | |
| 1. First-Year | | | | | | | | | | | |
| 2. Cumulative | .81*** | | | | | | | | | | |
| Retention | | | | | | | | | | | |
| 3. Sophomore Enrollment | .36*** | .34*** | | | | | | | | | |
| 4. Graduation Within 5 Years | .46*** | .50** | .61*** | | | | | | | | |
| Cost | | | | | | | | | | | |
| 5. Composite Cost | −0.21*** | −0.24*** | −0.24*** | −0.23*** | | | | | | | |
| 6. Cost Item 1 | −0.07 | −0.08 | −0.12* | −0.14* | .76*** | | | | | | |
| 7. Cost Item 2 | −0.27*** | −0.31*** | −0.20*** | −0.18** | .80*** | .42*** | | | | | |
| 8. Cost Item 3 | −0.19** | −0.26*** | −0.26*** | −0.22*** | .86*** | .51*** | .66*** | | | | |
| 9. Cost Item 4 | −0.14* | −0.11 | −0.20*** | −0.21*** | .85*** | .61*** | .52*** | .62*** | | | |
| Control Measures | | | | | | | | | | | |
| 10. ACT | .24*** | .21*** | .15** | .10 | −0.14* | −0.16** | −0.09 | −0.11 | −0.09 | | |
| 11. Semesters of Enrollment | .43*** | .47*** | .75*** | .84*** | −0.23*** | −0.13* | −0.19** | −0.23*** | −0.21*** | .13* | |
| M | 3.08 | 3.19 | .88 | .77 | 3.08 | 3.54 | 2.94 | 2.87 | 2.96 | 31.34 | 6.89 |
| SD | .69 | .60 | .33 | .42 | 1.13 | 1.22 | 1.36 | 1.41 | 1.51 | 2.71 | 2.14 |
| n | 295 | 296 | 296 | 296 | 291 | 290 | 291 | 291 | 290 | 298 | 298 |

Note: For retention data, 0 = not enrolled/graduated, 1 = enrolled/graduated.

- * $p < .05$.
- ** $p < .01$.
- *** $p < .001$.

To test the second hypothesis that cost scores predict retention status, we first conducted a logistic regression with composite cost scores as the predictor variable and sophomore-year enrollment as the binary outcome variable. The model revealed the predicted relationship between the two variables: Specifically, for every one-unit increase in perceived cost, students were about half as likely to be enrolled in the fall of sophomore year (OR = 0.54 [95% CI: 0.40–0.74], $p < .001$). We then conducted a second logistic regression with cost scores as the predictor variable and college graduation as the outcome variable. Once again, cost was a negative predictor, such that for every one-unit increase in perceived cost the odds of graduation decreased by about one-third (OR = 0.63 [0.49–0.80], $p < .001$).

Per an anonymous reviewer’s suggestion, we conducted a follow-up exploratory analysis, including GPA (first-year or cumulative) as an additional predictor of retention outcomes (sophomore enrollment and college graduation, respectively). In line with prior research (e.g., Chen, 2013), GPA significantly predicted sophomore enrollment (OR = 2.95 [1.83–4.77], $p < .001$) and college graduation (OR = 9.22 [4.67–18.21], $p < .001$). With these updated models, cost still predicted sophomore enrollment (OR = 0.59 [0.42–0.82], $p = .002$) and college graduation (OR = 0.74 [0.56–0.98], $p = .04$), albeit less powerfully than when it was the sole predictor of retention status.

Our quantitative analyses confirmed existing findings on the links between cost and academic outcomes, indicating that students who perceived academics as relatively costly during their first year of college were at greater risk for poor academic achievement and were less likely to graduate from the institution where they initially matriculated. These findings extend previous research by showing that cost perceptions early in college negatively predict achievement outcomes when assessed at a holistic, domain-general level. Moreover, the predictive relationship between cost and retention holds far beyond a single course or major area of study, with students’ perception of cost during the first year of college predicting retention outcomes several years later.

3.2. Qualitative analyses

Based on a median split of participants’ quantitative cost composite scores, we divided the sample into High and Low Cost groups. High Cost participants ($n = 90$) were those with scores greater than 3, and Low Cost participants ($n = 95$) were those with scores less than 3. Approximately 10% of the sample ($n = 28$) who scored exactly 3 were dropped from the analysis in order to ensure that the cost groups would have a

similar number of participants and be relatively distinct with respect to quantitative cost reports.

The prevalence of each code for High Cost and Low Cost students is presented in Table 3. By considering these code frequencies as well as the content of specific responses, we identified three themes for the Time Unmotivated responses and three themes for the Time Motivated responses, as elaborated below. Although we considered elements that applied across the full sample, our analysis was driven by a focus on what differentiated High and Low Cost students.

3.2.1. Time unmotivated

3.2.1.1. Theme 1: Low Cost students dislike tedium. A substantial portion of both High and Low Cost groups received the *Course is Unfulfilling* code (39% and 32%, respectively) for their descriptions of times they were unmotivated. Their reasons behind this code, however, appeared to differ. Low Cost students in particular seemed more likely than their

Table 3
Code frequencies by cost status.

| Code | Cost Group | |
|---|-------------------|------------------|
| | High $n = 180$ | Low $n = 185$ |
| Time Unmotivated | | |
| Course is Unfulfilling | 0.39 | 0.32 |
| Subcode: Dislike of Tedious Assignments | 0.20 | 0.41 |
| Subcode: Dislike of Challenging Material | 0.17 | 0.10 |
| Feeling Incompetent or Hopeless | 0.29 | 0.22 |
| Poor Professor/Learning Environment | 0.16 | 0.14 |
| Too Much Work | 0.14 | 0.18 |
| Non-academic Priorities | 0.13 | 0.07 |
| Feeling Drained | 0.11 | 0.19 |
| Mental Health or Personal Problems | 0.10 | 0.13 |
| Time Motivated | | |
| Mastery/Competence | 0.41 | 0.52 |
| Subcode: Deep Understanding | 0.69 | 0.79 |
| Subcode: Self-Regulation | 0.25 | 0.10 |
| Autonomous Motivation | 0.30 | 0.47 |
| Effective Professor | 0.23 | 0.23 |
| Balance, Hopefulness, and Mental Wellness | 0.23 | 0.15 |
| Time Pressure/Poor Performance | 0.18 | 0.13 |
| Controlled Motivation | 0.06 | 0.03 |
| Peers | 0.06 | 0.02 |

Note: Codes are presented in descending order of frequency for the High Cost group.

High Cost peers to cite tedium or lack of relevance as an unmotivating factor. In order to examine this possibility more precisely, we developed two additional subcodes: one indicating a dislike of tedium and one indicating an opposing dislike of challenging material (see Table 1).

Of those who indicated their courses were unfulfilling, Low Cost students (41%) were twice as likely as High Cost students (20%) to report a dislike of tedium. These Low Cost students expressed frustration when it seemed like they were merely asked to memorize course content, and generally felt unmotivated when it seemed like they were not learning: “There were times I felt totally unmotivated to do my economics work because it was such a straightforward and dry class. I wasn’t challenged or particularly interested, so it wasn’t super engaging for me.” This desire for challenge and dislike of tedium would seem to promote high academic achievement—a pattern supported by the quantitative finding that students lower in cost perceptions performed better and persisted longer at the institution.

The subcode for disliking challenge revealed a parallel, though less pronounced, difference: 17% of High Cost students (vs. 10% of Low Cost students) who indicated their courses were unfulfilling described them as unreasonably demanding or difficult. These High Cost students indicated that “homework and tests are just too hard for me to master,” or that the course had “really hard and technical material that I felt was too challenging to make good work out of.” Their responses described or alluded to their sense of incompetence, and suggested that the effort or opportunity cost of succeeding in the course seemed too high for the grade payoff. This was also echoed in the *Feeling Incompetent or Hopeless* code, which was more frequent for High Cost students (29%) than their Low Cost counterparts (22%). High Cost students’ tendency to comment on the taxing nature of their courses speaks to the ecological validity of the cost construct itself: Cost is not merely something that can be measured using Likert scales on a survey instrument, but something that students spontaneously generate as a meaningful motivational dimension.

3.2.1.2. Theme 2: High Cost students flag non-academic priorities.

Another way in which students assessed the cost of academics was through descriptions of non-academic priorities. High Cost students (13%) were nearly twice as likely as their Low Cost counterparts (7%) to provide responses that received the *Non-Academic Priorities* code for their descriptions of times they were unmotivated. In some cases, High Cost students directly compared academic to non-academic priorities, as in the case of one student who wrote, “Sometimes I get back from my job, and I find I am far more interested in doing that than in my class work. It feels like I am simply treading water at school. It feels pointless.” For other High Cost students, non-academic priorities simply came in the form of other more engaging activities, which seemed to indicate that academics were not a passion but rather an obstacle to a passion. By definition, High Cost students are concerned about the costs of schoolwork relative to other activities; the fact that they reported non-academic priorities more frequently in their open-ended responses than Low Cost students further validates the cost construct.

3.2.1.3. Theme 3: Low Cost students recognize the temporary nature of motivational problems—but are not immune to hopelessness.

Low Cost students were more likely than their High Cost peers to write about transient problems, which was evident in the frequencies of the *Feeling Drained* code (19% of Low Cost students vs. 11% of High Cost students). Low Cost students were often able to pinpoint specific times when exceptional circumstances explained their amotivation, and also seemed aware that their motivational problems were only temporary: “I’m sick and I’m tired, but this will pass.” The Low Cost students’ statements pointed to their adaptive tendency to attribute their amotivation to typical, expected parts of the college experience, such as feeling exhausted after midterms or not having gotten enough sleep. Given the negative correlation between cost and academic performance in the

quantitative analysis, the differing perceptions between Low and High Cost students may be grounded in their varying levels of academic success.

At the same time, both High and Low Cost students reported feeling hopeless or despondent about schoolwork on occasion, communicating that there seemed to be no point in trying because they were too far behind. As one Low Cost student explained, “When I had so much work to do or I felt I didn’t even have a chance at understanding what was going on in my classes, I felt very unmotivated and wanted to give up.” Similarly, a High Cost student recalled that they felt unmotivated when it seemed “too late for me to understand the tougher math concepts and catch up to the rest of the course.” For many High Cost students in particular, lack of motivation was an enduring problem, often entangled with poor performance and feelings of incompetence.

3.2.2. Time motivated

3.2.2.4. Theme 4: High Cost students focus on regulation, whereas Low Cost students focus on understanding.

Mastery/Competence and *Autonomous Motivation* were by far the most prevalent codes for both cost groups, but more often characterized responses of Low Cost students than High Cost students (52 % vs. 41% for *Mastery/Competence*; 47 % vs. 30% for *Autonomous Motivation*). Moreover, the nature of responses across the two cost groups tended to differ: Whereas High Cost students seemed to focus more on self-regulation and task completion, Low Cost students seemed to focus on mastering the content and submitting their best work. To probe this possibility, we developed two subcodes: one indicating satisfaction with time management and productivity, and another indicating a deep understanding of course content (see Table 1).

The subcode representing time management and productivity was more than twice as likely among the High Cost students (25%) as the Low Cost students (10%). These High Cost students recalled heightened motivation during particularly demanding times in the semester: “I had a bunch of work due in one week and I knew that if I didn’t focus and follow the schedule I had set myself I wouldn’t get it done. Knowing that I needed to get it done helped motivate me.” For High Cost students who—by definition—tend to be sensitive to the effort and opportunity costs of schoolwork, pragmatism may be more important than academic self-actualization. The importance of self-regulation for High Cost students was also apparent in their responses that received the *Balance, Hopefulness, and Mental Wellness* code; these High Cost students indicated that they felt most motivated when, as one student put it, “every aspect of my life was organized, under control, and I had a positive perspective.” Overall, High Cost students’ responses suggested that they felt motivated when their workload was manageable and they had the capacity to make progress on that work.

Because the subcode for deep understanding represented the main thrust of the overarching *Mastery/Competence* code, it was heavily represented in both groups—but more so for Low Cost students than High Cost students. 80% of Low Cost students (vs. 69% of High Cost students) who wrote about experiences of mastery and competence described deep understanding as the key motivational factor. Rather than describe demanding periods of time as opportunities to get things done, Low Cost students tended to portray them as opportunities to learn: “I feel especially motivated studying for finals because it’s a good way to solidify the material learned throughout the semester and I want to demonstrate the knowledge I’ve gained.”

In addition to their dedication to learning the material at a deeper level, Low Cost students often expressed a genuine interest in the work involved. As one Low Cost student explained, they were motivated when writing a humanities paper and “really went the extra mile to do research and formulate complex questions.” Interestingly, an analysis of joint code frequencies confirmed that *Mastery/Competence* and *Autonomous Motivation* were cited together more often by Low Cost students (21%) than by High Cost students (9%), suggesting that the two

experiences were often intertwined for the former. Generally, Low Cost students appeared to focus on both understanding the material and learning for learning's sake—an advantageous perspective in this particular context given that it is part of the college's mission statement.

3.2.2.5. Theme 5: High Cost students strive to avoid undesirable outcomes. Compared to their Low Cost peers, High Cost students' responses were characterized by a greater focus on avoiding undesirable outcomes such as academic failure, as reflected in the differing code frequencies for the *Time Pressure/Poor Performance* code (18 % vs. 13%). Such avoidance behavior was exemplified by a High Cost student who explained, "Whenever I have an exam coming up, I scare myself into doing work because, frankly, I don't like failing." High Cost students may seek to avoid failure, in part, because of a history of poor performance—an explanation consistent with the quantitative finding that higher cost perceptions predicted lower GPAs.

High Cost students were also characterized by their desire to prove themselves to others, rather than learn for their own growth, as reflected in the disparities of the *Controlled Motivation* code (6% High Cost vs. 3% Low Cost). For instance, one High Cost student wanted to show they could write a good essay "because my previous essay wasn't what my teacher wanted." In a more extreme case, a participant explained that their motivation primarily stemmed from "impostor syndrome and fear that my professors [sic]/peers would judge me if I did something foolish/uncollegelike/obvious"—a pervasive experience for this student. Consistent with the construct of cost itself, these High Cost students tended to portray academic work as more of a burden than an opportunity for growth.

3.2.2.6. Theme 6: support from others is important for everyone. High Cost and Low Cost students alike expressed the positive influence of close relationships with professors and peers. Most frequent were descriptions of effective professors, which were equally common among the cost groups (23% for each). Relatively few participants cited the role of peers (6% of High Cost, 2% of Low Cost), which was surprising given the prevalence of seminar style courses at this particular institution. Students who mentioned peers conveyed experiences of relatedness, and felt invigorated by class discussions. However, it was clear that support from professors was far more impactful in students' accounts of times when they were especially motivated.

Participants from both cost groups described professors as inspiring, helpful, and supportive—reporting that professors instilled faith in their abilities to succeed and grow. As a Low Cost student recalled, they were motivated to study a certain text not only because it was inherently interesting, but because "the professor was able to get me to explore it in more depth than I personally thought myself capable of." Similarly, a High Cost student wrote, "I really want to do well in [a professor's] class because I know she believes I can do it, and I don't want to let her down." These responses suggest that professors have the potential to motivate students regardless of whether they perceive learning as costly. Professors can help Low Cost students attain a new level of understanding and mastery, and they can help High Cost students discover interest in a subject, making a course feel worthwhile. For High Cost students in particular, professors may be in a unique position to assuage some of their negative feelings surrounding academics.

4. Discussion

The present study investigated the role of first-year college students' perceived costs with respect to their academic outcomes, and used cost as a lens for analyzing students' experiences of school. Our quantitative results replicated previous research on the link between cost and poor academic achievement (Jiang et al., 2018; Perez et al., 2019), as well as the link between cost and low retention (Hong & Bernacki, 2022; Perez et al. 2014; Robinson et al. 2019). We extended the literature by

analyzing the predictive value of domain-general cost perceptions for longer-term measures of academic outcomes. Far beyond a specific course or semester, first-year perceptions of cost predicted students' academic performance for the duration of their time at the institution, as well as students' likelihood of graduation from the institution. These findings highlight the importance of cost perceptions during students' college experience: Those with relatively low perceived costs tend to remain enrolled and perform better in school, while those with relatively high perceived costs are at risk for poor academic performance and dropout.

Our qualitative analysis was built from codes that converged with Johnson and Safavian (2016), who identified cost concepts such as the amount of time and effort involved in doing academic tasks (*Too Much Work*), having to do well academically for others (*Controlled Motivation*), and loss of interest in classes (*Course is Unfulfilling*). As expected, we found discernible differences in the way High and Low Cost students described their motivational experiences. High Cost students were characterized by their focus on regulation, avoidance of undesirable outcomes, and emphasis on non-academic priorities. Low Cost students were characterized by their dislike of tedium, desire to master the material, and recognition of motivational problems as transient.

Notably, intrinsic motivation (or lack thereof) cut across our identified themes: Low Cost students sought challenge and expressed genuine interest in learning, while High Cost students tended to focus on simply completing assignments. This pattern is consistent with research indicating that high perceived costs accompany low intrinsic value (Benden & Lauer mann, 2022; Robinson et al., 2019). Future studies might examine whether demographic or personality factors explain this disparity in intrinsic motivation observed between the two groups. For instance, perhaps a greater proportion of High Cost students are first-generation college students or come from low-income families, and life circumstances force them to be more practical about their studies. Students' cultural backgrounds may also determine the way they experience the costs of academics. For example, students from collectivist cultures may feel that it is their responsibility to do well in school as a way of bringing pride to their family (Johnson & Safavian, 2016), even if intrinsic motivation is lacking. Evidence of the role of demographic differences would be in line with Getty et al. (2021), who disaggregated their data by gender and found that female-identifying students cited psychological costs significantly more often than their male-identifying counterparts when describing factors that decreased academic motivation.

Importantly, the integration of the quantitative and qualitative data in our mixed-methods study allowed for key insights that would not have been afforded by either a quantitative or qualitative approach alone (Creswell & Plano Clark, 2010; Johnson & Onwuegbuzie, 2004). By categorizing students as "High Cost" or "Low Cost" based on their quantitative reports, we were able to identify features of their open-ended responses that were connected to their experiences of school as costly, akin to Beymer et al.'s (2022) investigation of teachers' perceived costs. Many of our identified themes validated the quantitative findings (e.g., High Cost students reported the desire to avoid poor performance, which is consistent with their low GPAs). Others introduced new ideas that we had not anticipated during the quantitative analysis (e.g., Low and High Cost students' differing emphases on content mastery and productivity, respectively). Together, the validation and depth of understanding afforded by the qualitative analysis helped account for the link between cost perceptions and achievement outcomes.

Throughout our characterizations of High and Low Cost students, we described the groups in broad strokes. But of course, no one characteristic is entirely representative of either group: Not every Low Cost student strives for mastery, just as not every High Cost student derives satisfaction from task completion. It would be useful for future research to examine the heterogeneity among each of these cost groups, and identify subtypes of High and Low Cost students. One might imagine

that Low Cost students, for example, can take on ideal and non-ideal forms: Their relaxed approach to academics may help them to take on challenging coursework, but a subset of Low Cost students might *only* apply themselves in areas in which they are deeply interested. We caution against assuming a one-size-fits all “type” of student.

The open-ended responses also revealed meaningful elements of the academic experience that were shared by Low and High Cost students. Despite the differences in the content of their open-ended responses, the two groups reported the same top sources of motivation (e.g., *Autonomous Motivation*) and amotivation (e.g., *Feeling Incompetent or Hopeless*). Notably, both kinds of students described the importance of effective professors, who empowered them to dive deep into a topic of interest, or encouraged them to venture beyond their academic comfort zones. These sentiments align with research on the importance of student-teacher relationships, suggesting that students feel motivated to put in effort when they perceive that their teachers support and care about them (Sakiz et al., 2012; Wentzel, 1997). The fact that many students spontaneously identified supportive professors suggests that faculty-student connections are a meaningful contributor to students’ motivation.

4.1. Educational implications

Our findings on the long-term impact of cost perceptions have implications for education practitioners. Given that cost perceptions predict long-term academic achievement and retention, it could be important to address cost perceptions early in college. From a student perspective, having high cost perceptions may be an obstacle to taking challenging but potentially gratifying courses, while having low cost perceptions may allow for the free exploration of academic interests. A recursive process (Garcia & Cohen, 2012; Kenthirarajah & Walton, 2015) may be at play, whereby first-year students interpret their academic performance in line with their cost perceptions, thus reinforcing their perceptions of academics as relatively costly or uncostly. For example, students who enter college with high cost perceptions may continuously interpret the costs of their coursework as part and parcel of the college experience, which in turn reinforces their perceptions of school as costly.

During the critical juncture that is the first year of college, it could be beneficial to frequently administer brief motivational assessments in order to identify High Cost students and check for warning signs of poor academic performance and dropout (Benden & Lauermann, 2022). Intervention efforts could then aim to help students reinterpret their challenging course experiences in a more positive way. Rosenzweig et al. (2020) designed such an intervention for students in an introductory college physics course, and found that it successfully lowered the cost perceptions of students with low initial exam scores. Encouraging students to think about their academic struggles as short-term, typical elements of the college experience could provide a powerful reframing, not unlike what the Low Cost students in our sample reported doing naturally. Indeed, research suggests that academic outcomes improve when students internalize the idea that their struggles are shared and short-lived (i.e., belonging uncertainty reduction; Walton & Cohen, 2011).

Professors can also support High Cost students by implementing transparent teaching methods (e.g., clearly articulated expectations and learning goals, rubrics detailing assessment practices). Transparency would help High Cost students make appropriate choices when deciding what courses to take and which assignments to prioritize, given their focus on regulation and time management. Professors could also aim to encourage mastery, rather than the “weeding out” of struggling students (Christe, 2013), as the latter approach may run the risk of reinforcing some students’ high cost perceptions. Such strategies are also consistent with best practices, so they would arguably benefit students regardless of their levels of perceived cost.

4.2. Limitations and future directions

Although we have extended the research on perceived cost in college, the present study is not without limitations. First, because of the non-experimental design, we cannot conclude that high cost perceptions cause poor academic outcomes. Future research is needed to determine whether a causal relationship between the two exists, and—if so—whether high cost perceptions cause poor academic outcomes or a history of poor academic performance contributes to high cost perceptions.

Second, even though our domain-general assessment of cost was a strength, we acknowledge that cost may function differently in different domains (Gaspard et al., 2018; Tuominen et al., 2020). Therefore, it would be valuable to study the role of cost in a domain-specific or class-specific way, in areas beyond STEM (e.g., social sciences, humanities).

Third, although the present study’s liberal arts context allowed us to examine domain-general cost perceptions, our participants attended an institution where cost may loom especially large because of the school’s rigor (Sheehy, 2013). Students at different types of institutions (e.g., community colleges) may perceive academics as costly for different reasons (e.g., because they must support a family on top of studying for their degree). Furthermore, liberal arts colleges typically emphasize intellectual inquiry and fulfillment (Seifert et al., 2008)—values that may attract students who are not representative of the general college population. To gain a more comprehensive understanding of the contexts for students’ cost perceptions, future research could compare students across a range of institutions.

Finally, our quantitative indicator of cost perceptions was somewhat limited in both the types of cost assessed and the timing of assessment. We used the four cost items from the Expectancy-Value-Cost Scale (Kosovich et al., 2015), which primarily represented effort cost. Assessing all three dimensions of cost (effort, opportunity, psychological) would be valuable, and could be done efficiently using Beymer, Ferland and Flake’s (2022) newly validated four-item scale (see also Flake et al., 2021). It would also be informative to assess cost at multiple time points during the semester given that students’ cost perceptions have been shown to fluctuate over time (Benden & Lauermann, 2022; Robinson et al., 2019). Our particular assessment came shortly before final exams. This could have inflated students’ cost reports given that cost perceptions tend to shift as a function of exam performance (Hong & Bernacki, 2022). Future studies should adopt a micro-developmental approach to examine how cost’s predictive validity differs during periods of varying academic intensity (see Benden & Lauermann, 2022; Hong & Bernacki, 2022). On a broader scale, it would be useful to assess cost throughout the college years in order to investigate the role of earlier versus later cost perceptions in academic outcomes.

Nonetheless, the present study demonstrates that cost perceptions early on in college serve as powerful predictors of academic outcomes, and illustrates how cost manifests in students’ experiences of school. Importantly, we built from the past literature on cost perceptions for STEM courses by documenting cost perceptions of the college experience more broadly. We showed that the predictive power of these domain-general perceptions extended to long-term outcomes, even spanning the course of several years. Our qualitative analysis identified some of the key characteristics of students who perceive school as especially costly, and linked these features to their relatively poor academic outcomes. This nuanced depiction could help educational psychologists and practitioners to structure courses in a way that best supports students. Although perceived costs are likely inevitable in college, educators may be able to help students see that those costs *can* be worth the reward—whether that be intellectual fulfillment, positive feedback from a professor, or the personal satisfaction of making progress on a challenging task.

Conflict of Interest

There are no conflicts of interest to declare.

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