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Perceived Academic Control and Positive and Negative Affect Among University Students: Cross-Sectional Associations and Examination-Day Differences

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ABSTRACT

Students' beliefs about their control over academic outcomes could be linked to their emotional experiences, but research on perceived academic control in relation to broader positive and negative affect is limited. This study investigated the relationships between perceived academic control (PAC) and affect, along with differences in students' affective reports between two assessment times on an examination day. Two complementary studies were carried out with university students in South Punjab, Pakistan. Study 1 used a cross-sectional correlational design with 350 students who completed the eight-item Perceived Academic Control (PAC) Scale and the 20-item Positive and Negative Affect Schedule (PANAS). Study 2 employed a one-group repeated-measures design with 75 different (undergraduate) students who completed the PAC and PANAS about 30 minutes before and after an examination. Pearson correlations, simple linear regression, paired-samples *t* tests, and Wilcoxon signed-rank tests were used to analyze the data. In Study 1, PAC was positively related to positive affect ($r = .420$, $p < .001$) and negatively related to negative affect ($r = -.373$, $p < .001$). The separate regression models explained 17.6% of the variance in positive affect and 13.9% in negative affect. In Study 2, negative affect ratings were significantly lower at the second assessment on both tests, while findings for positive affect differed between tests. Overall, the results suggest a relationship between perceived academic control and affective experiences. However, the cross-sectional design of Study 1 does not allow causal conclusions, while the overlapping past-week recall periods and absence of a comparison group in Study 2 limit the interpretation of examination-related differences.

Introduction

Examinations, deadlines, assessment feedback and decisions about academic progress are part of university learning. Students respond to these demands in various ways and research in educational psychology relates these responses partially to how students perceive their ability to affect course success (Pekrun, 2006, 2024; Perry et al., 2001). Emotional experiences are thus important for understanding student adjustment, but it is crucial to keep in mind that beliefs about control do not necessarily correspond to the reported emotions in a specific academic context (Skinner, 1996; Pekrun, 2024).

Perceived academic control (PAC) is defined as students' expectations of how their academic behavior relates to achievement results (Perry et al., 2001). It is specific to the domain: Self-efficacy is more about what someone believes he or she can do within a specific domain, while general perceived control is more about what he or she can do in a broader domain of life (Bandura, 1997; Skinner, 1996). These constructs can be coupled but not replaced. PAC is particularly relevant to universities, where students are constantly required to assess whether the preparation, effort and study they put in can impact the results of the assessment (Perry et al., 2001; Fishman, 2014).

Emotional outcomes discussed here are positive affect and negative affect, measured by the Positive Negative Affect Schedule (PANAS). These dimensions are general and easily recognized rather than conflicting scores along a continuum (Watson et al., 1988). However, while there is research concerning specific achievement emotions in the context of education, the broad affect ratings can be neither considered a direct measure of examination anxiety or relief nor academic enjoyment (Pekrun, 2006, 2024; Watson et al., 1988). The present research thus takes both a theoretical and an empirical approach, with the understanding of the difference between the two levels of evidence made explicit.

Control–Value Theory (CVT) suggests that subjective value appraisal and control appraisal are key factors in achievement emotions like enjoyment, anxiety, pride, and boredom from learning activities or their results (Pekrun, 2006). As part of this contemporary account, the focus is placed on the reciprocal relationship between appraisals, emotions, achievement and educational contexts (Pekrun, 2024). This provides an argument for why PAC should be connected to affective experiences but does not imply that PAC is the sole determinant of students' emotions. Situation-specific control appraisals and task value appraisals would be required for a more direct measurement of CVT (Pekrun, 2006, 2024; Raccanello et al., 2026).

Longitudinal evidence is important in providing an important context. Perry et al. (2001) conducted a study with 524 college students and found that higher academic control correlated with decreased boredom and anxiety, increased effort and more adaptive achievement-related behavior. Respondek et al. (2017) analyzed 883 university students and found correlations with enjoyment, anxiety, boredom, and outcomes for persistence and achievement with PAC. In Fishman (2014), academic control was correlated with the sense of responsibility and knowledge building behavior of students. These studies together have found connections between control beliefs and academic adjustment, but not specifically within both subscales of the PANAS affect.

There is some recent evidence that the pattern is emotion- and context-dependent, and appraisal-measure dependent. Overall, Raccanello et al. (2026) found positive relations between perceived control and positive achievement emotions, and between value and positive achievement emotions, whereas the relations between perceived control and negative achievement emotions, and between value and negative achievement emotions were, in general, negative. The relations involving interactions between perceived control and value by emotion were limited and varied. However, in a sample of Pakistani undergraduate students, Ashraf and Malik (2026) found that perceived control and course-specific value inversely correlated with course-specific boredom and that there was a small interaction between the two. Conversely, Skues et al. (2025) did not find any significant direct relationship between perceived control and achievement emotions in their sample from a university in Australia, nor did their structural model fit well. The results of this study are a warning against assuming control–emotion relationships as uniform and universally established.

The PANAS was created by Watson et al. (1988) to measure positive affect (enthusiasm, alertness) and negative affect (distress, irritability) separately. It is relevant to the distinction when control beliefs are associated with different pleasant and unpleasant emotions. Positive and negative affect should be analyzed separately, not assuming that a decrease in one inevitably equates to an increase in the other (Watson et al., 1988).

Other research on general control beliefs provides some supporting evidence, but not the same evidence. Eryılmaz and Ercan (2010) investigated 340 Turkish university students, and found that perceived control across domains were correlated with subjective well-being scales, which included PANAS. Yao et al. (2025) correlated general sense of control with emotional experience of Chinese undergraduates and they also employed an experimental control manipulation. Academic control was not measured in the same way with the same PAC as here for either study, so that these findings cannot be interpreted as replications of the PAC–PANAS association. A separate meta-analysis of 14 studies identified a median positive average

association between positive affect and academic performance, and a median negative average association between negative affect and academic performance, though the latter was not statistically significant; both had significant heterogeneity (Gordillo-León et al., 2026). That review is about academic performance, and the present studies did not have academic performance as an outcome.

Examining periods provide a relevant context to study emotional variability but there are important considerations about when it is being assessed. In their study of emotion and coping during the anticipation, waiting, and outcome phases of a college exam, Folkman and Lazarus (1985) found both group changes and significant individual differences. Giacobbi et al. (2007) used daily reports to measure affect and appraisals during the period prior to final examinations while Shaheen et al. (2022) measured test anxiety at different phases of medical students' computer-based assessments. The above studies demonstrate that emotional consequences vary at different points in the examination process, but neither of the studies suggests that global past week PANAS ratings are a proxy for acute examination-related states.

A methodological comparison is given with intensive longitudinal work. At the within-person level, Schlechter et al. (2025) found associations between upward comparison and stress during test preparation and negative mood during examination, and at the between-person level, associations between upward comparison and negative mood during test preparation and during examination. Van der Mee et al. (2026) did report on differences in the different mood states over a 28-day period of examination, and noted how much the larger emotional summary can mask differences between the specific emotions. Both studies support the value of repeated assessment over specified time periods and the results do not serve as direct precedents for using two repeated assessments conducted on the same examination day, as indicators of momentary changes in affect.

Academic control is correlated with specific achievement emotions, while general control is correlated with more general emotional outcomes, but these are not equivalent constructs (Perry et al., 2001; Respondek et al., 2017; Eryılmaz & Ercan, 2010; Yao et al., 2025). The mixed results from Skues et al (2025) and research findings reporting expected relationships (Ashraf & Malik, 2026; Raccanello et al, 2026) warrant further investigations of the relationships between a specific population and specific measures. The current study provides descriptive evidence from university students in Pakistan while separately considering between-person associations and within-person assessment differences.

Study 1 tested the positive association between PAC and PANAS positive affect, and the negative association between PAC and PANAS negative affect in a cross-sectional university sample. Study 2 examined if reports of past-week affect differed between two assessments around an examination that took place in a different sample. Study 2 was not intended to test an immediate emotional reaction to the examination; the instructions for recall referred to relatively overlapping recall periods, and there was no comparison condition. Study 2 was exploratory and the hypotheses for Study 1 were kept in the interpretation.

Method

Study 1: Cross-Sectional Investigation

Design and Participants

A cross-sectional correlational design was used. The sample comprised 350 students recruited from Bahauddin Zakariya University, Multan, Pakistan. There were 76 men (21.7%) and 274 women (78.3%), aged 18–26 years. Age categories, educational levels, and academic years are reported in Table 1.

Measures

Perceived academic control. PAC was assessed with the eight-item measure described by Perry et al. (2001). Items 3, 5, 6, and 8 were reverse-scored as required by the study's scoring procedure, and the items were then combined to form a total score. Higher scores denoted higher perceived academic control. Cronbach's alpha in this sample was .731.

Positive and negative affect. The 20-item Positive and Negative Affect Schedule (PANAS; Watson et al., 1988) assessed positive affect and negative affect using 10 items per subscale. Participants rated their affective experiences over the preceding week using response options from 1 (very slightly or not at all) to 5 (extremely). Subscale totals were calculated separately; higher scores represented more of the respective affective dimension. Internal consistency was .856 for positive affect and .882 for negative affect.

Procedure

Participants provided informed consent and completed the PAC, PANAS, and demographic questionnaires on one occasion before an upcoming examination.

Study 2: Examination-Day Repeated-Measures Investigation

Design and Participants

A one-group repeated-measures design included 75 students from the same university who were not part of Study 1. Participant aged between 18 to 26 years and majority were females (72%) All 75 students were from undergraduate classes and contributed reports at both assessment occasions. No comparison group, intervention, or random assignment was used.

Measures and Procedure

The same 20-item PANAS was administered approximately 30 minutes before the examination began and again approximately 30 minutes after the students completed the examination. The same past-week instruction was used on both occasions, resulting in almost entirely overlapping recall periods. These assessments consequently represent two reports of recent affective experience, rather than measures of momentary emotion immediately before and after the examination. Cronbach's alpha for positive affect was .708 at the first assessment and .686 at the second; for negative affect, the corresponding estimates were .766 and .760.

The eight items of the PAC were only measured at baseline and reverse-coded. Its internal consistency was low in Study 2, $\alpha = .541$, which does not provide a high degree of confidence in the total score. Thus, in this sample, PAC was not included in substantive analyses.

Data Analysis

The data sets were examined individually in SPSS. Descriptive statistics, Cronbach's alpha coefficients, and Pearson product–moment correlations were computed in the first study. Simple linear regression was used to evaluate the relationship between PAC and positive affect and negative affect, respectively. PAC was the sole predictor in each model, and no additional covariates were included. For Study 2, paired-samples t tests were used to compare scores across occasions for the PANAS. Paired difference scores were analyzed using the Shapiro–Wilk test. Wilcoxon signed-rank tests were performed as supplementary analyses given that both distributions were not normally distributed. Two-sided tests were conducted at $\alpha = .05$; reported mean differences, 95% confidence intervals, and standardized paired effect size facilitated interpretation.

Results

Study 1

Table 1: Participant Characteristics in Study 1 (N = 350)

Characteristic	Category	*n*	%
Age	18–20 years	254	72.6
	21–23 years	85	24.3
	24–26 years	11	3.1
Gender	Men	76	21.7
	Women	274	78.3
Education	Undergraduate/BS	127	36.3
	Master's/MS/MPhil	219	62.6
	Other	4	1.1
Year of study	First	209	59.7
	Second	24	6.9
	Third	27	7.7
	Fourth	90	25.7

Note. n = 350. Percentages are rounded.

As shown in Table 1, most participants were women (78.3%) and were in the 18–20-year age category (72.6%). The sample also included a substantial proportion classified as master's/MS/MPhil students (62.6%). Just over half of the students were recorded as being in their first academic year (59.7%).

Table 2: Descriptive Statistics, Internal Consistency, and Correlations in Study 1

Variable	*M*	*SD*	*α*	1	2	3
1. PAC	23.77	5.04	.731	—	.420***	−.373***
2. Positive affect	29.47	6.91	.856	.420***	—	.009
3. Negative affect	30.10	7.61	.882	−.373***	.009	—

Note. n = 350. Pearson's r. ***p < .001. PAC = perceived academic control.

The internal consistency of PAC is acceptable and the two affect subscales are more reliable (see Table 2). PAC was moderately and positively related to positive affect, r(348) = .420, p < .001, and moderately and negatively related to negative affect, r(348) = −.373, p < .001. There was no significant correlation between positive and negative affect, r(348) = .009, p = .871. The data confirmed both directional hypotheses and indicated that the two had different effects on score that were different in this sample.

Table 3: Simple Linear Regression Models for Positive and Negative Affect

Outcome	*B*	*SE*	*β*	*t*	R^2	F(1, 348)	*95% CI for B*
Positive affect	0.576	0.067	.420	8.63	.176	74.48	[0.444, 0.707]
Negative affect	−0.562	0.075	−.373	−7.49	.139	56.15	[−0.710, −0.415]

Note. N = 350. PAC was the sole predictor in each model. CI = confidence interval. Both models had p < .001.

The regression results in Table 3 showed that PAC was positively associated with positive affect, $F(1, 348) = 74.48$, $p < .001$, accounting for 17.6% of its variance. PAC was negatively associated with negative affect, $F(1, 348) = 56.15$, $p < .001$, accounting for 13.9% of its variance. The R^2 values for these were cross-sectional, single-predictor models, and so do not indicate that PAC was an independent predictor of affect after controlling for other factors.**Study 2**

Table 4: Affect Scores and Internal Consistency at Each Assessment

Outcome	Assessment	*M*	*SD*	*α*	Observed range
Positive affect	Before	33.29	6.20	.708	19–48

Outcome	Assessment	*M*	*SD*	*α*	Observed range
	After	32.17	6.71	.686	17–47
Negative affect	Before	29.21	7.25	.766	16–43
	After	25.07	7.43	.760	11–43

Note. $n = 75$. Assessments occurred approximately 30 minutes before and after the examination. Table 4 indicates that mean positive-affect and negative-affect ratings were lower at the later assessment, with a larger descriptive difference for negative affect. Internal consistency ranged from .686 to .766 across the four scores. Because both reports concerned the preceding week, the means describe how students rated substantially overlapping experiences at two occasions rather than their immediate emotional state during the examination.

Table 5: Paired Comparisons of Affect Ratings Across Examination-Day Assessments

Outcome	Change M (SD)	*95% CI*	t(74)	p (t)	d_z	Wilcoxon W	p (W)
Positive affect	−1.12 (4.95)	[−2.26, 0.02]	−1.96	.054	−0.23	641	.018
Negative affect	−4.15 (5.18)	[−5.34, −2.96]	−6.94	< .001	−0.80	187.5	< .001

Note. $n = 75$. Change = score after minus score before the examination. d_z = standardized paired mean difference. Shapiro–Wilk tests indicated nonnormal difference distributions for positive ($W = .932$, $p < .001$) and negative affect ($W = .867$, $p < .001$).

As presented in Table 5, negative-affect ratings were lower at the second assessment by an average of 4.15 points, 95% *CI* [−5.34, −2.96]. Both the paired-samples test, $t(74) = -6.94$, $p < .001$, and Wilcoxon test, $W = 187.5$, $p < .001$, confirmed the difference, and the effect size in standardized paired terms was d_z = −0.80. For positive affect, the mean difference was −1.12 points, but the paired t test was not significant, $t(74) = -1.96$, $p = .054$, whereas the Wilcoxon test was, $W = 641$, $p = .018$. This disagreement does not justify a definitive claim of a positive-affect difference, particularly given the overlapping retrospective reporting periods.

Discussion

The two studies focus on different aspects of emotional experience in university students. In Study 1, positive affect was positively related to higher PAC and negative affect was negatively related to higher PAC. The results for the ratings of past-week negative affect were more favorable at the later assessment day than at the earlier one, whereas the evidence for a difference was more mixed for ratings of past-week positive affect, depending on the statistical test used in Study 2. Since the two samples and measurement designs are separate, the two sets of results cannot be understood as a single emotional process.

The Study 1 associations make sense in light of the existing literature that found that academic control is positively related to the adjustment and reduction in negative achievement emotions. Perry et al. (2001) found positive relationships between academic control and decreased anxiety and boredom, and Respondek et al. (2017) found negative relationships between academic control and anxiety and boredom and positive relationships between academic control and enjoyment. The following results are for the Positive and Negative Affect measures of PANAS and not for those particular academic emotions. These findings concern broad positive and negative affect and are therefore not direct replications of studies examining discrete achievement emotions, such as enjoyment, anxiety, and boredom.

An interpretation of CVT is that control appraisals can be relevant to the experience of achievement settings, especially when tasks and outcomes are relevant to the students (Pekrun, 2006, 2024). However, the current data do not assess task value or appraisal processes outlined by CVT, and the cross-sectional design does not allow for determining whether control beliefs come before affective experiences. Academic agency is also part of a broader motivational process, as Fishman (2014) proposes that PAC could be linked to responsibility and self-regulation. Here, these mechanisms are not yet demonstrated as routes in the current analyses, but are still possibilities.

The results need to be understood in the context of inconclusive evidence. In the Pakistani context, Ashraf and Malik (2026) reported negative associations of perceived control and task value with course-specific boredom. While in Italy, broadly expected but emotion-dependent patterns were reported by Raccanello et al. (2026) in a sample from a university. But, no significant direct relationships between perceived control and achievement emotions were found in Skues et al.'s (2025) poorly fitting Australian structural model. Simple cross-study comparisons are limited by the different constructs, samples, outcome specificity and analytic models used. This study's findings fit into one strand of literature but do not rule out this difference.

For the single-predictor models, PAC explained 17.6% of the variance in positive affect and 13.9% of the variance in negative affect. These represent proportions of explained variance within the fitted statistical models only and do not indicate that PAC is independently responsible for either outcome. Task value, academic history, and other factors that might explain the findings were not explored, and so omitted-variable explanations exist (Pekrun, 2024; Raccanello et al., 2026). A small correlation between positive and negative affect is consistent with the idea that these are separate dimensions as suggested by Watson et al. (1988), but does not prove that positive and negative affect are unrelated in other populations or contexts.

Study 2 showed slightly lower ratings of negative affect at the later assessment, which was confirmed by the paired-sample t tests and Wilcoxon tests. The positive-affect result was less consistent: There was no conventionally significant paired t test, but there was a Wilcoxon signed-rank test. Since the procedures measure different components of the paired differences and the differences were not normally distributed, this discrepancy is not resolved by selecting the more favorable p-value, but should be reported. The easiest to defend interpretation is that the negative-affect reporting difference was statistically more pronounced than the positive-affect reporting difference.

Studies of examinations aid in pinpointing this finding but not the cause. Folkman and Lazarus (1985) reported emotion and coping changes and individual differences throughout an academic examination. Giacobbi et al. (2007) related the daily affects to academic-event appraisals prior to examinations, while Shaheen et al. (2022) found that test-anxiety scores varied from one assessment stage to another. More recent experience sampling research indicates that stress and different moods fluctuate over the course of examination periods (Schlechter et al., 2025; van der Mee et al., 2026). These studies employed varying instruments and time periods, with no one study providing direct evidence for the conclusion that the administration of this examination led to the lower PANAS negative-affect ratings in this sample.

One of the measurement constraints that was adhered to in the past week was having the same past-week instruction on both assessments, and the assessments were administered on the same examination day. Therefore, the reporting time frames were almost identical. The PANAS is a validated broad affect measure that has flexible time instructions, but a

retrospective response to the past week does not capture a short state immediately prior to or after an exam (Watson et al., 1988). The difference in responses could be due to recall, the context of the current appraisal, or other factors not measured. In general, a possible explanation is a decrease in negative affect due to the exam, and a reduction in test anxiety in general, but these were not confirmed by Study 2.

Implications for Research

The most salient contribution of the two-study project is the separation of the between-person association and within-person difference across reporting occasions. The Study 1 results support the literature that states that students' beliefs about academic control are associated with emotional experiences, whereas the Study 2 results demonstrate the importance of measurement instructions that correspond to the intended temporal construct (Perry et al., 2001; Respondek et al., 2017; Watson et al., 1988). Future research, in the context of CVT, should assess academic task value and specific achievement emotions in addition to broadly assessed affect (Pekrun, 2024) and should employ a momentary or clearly bounded time frame, ideally across multiple examination and comparison days (van der Mee et al., 2026). No practical benefits were inferred from the present correlations for the increase of PAC because intervention testing would be needed.

Limitations

The generalizability of both studies is limited as they were based on self-report from one university. There was an overrepresentation of women in Study 1. Study 1 was cross-sectional and was based on unadjusted single-predictor models, so there are no causal implications, and there are no independent associations. Study 2 included 75 participants and no control/comparison condition. It has the most serious drawback of using an overlapping past-week recall window at both assessment occasions, making it impossible to interpret the results as immediate emotional changes. Internal consistency of the PAC was low in Study 2 ($\alpha = .541$), which did not allow meaningful interpretation of that score, and it was therefore excluded from the Study 2 association analyses. Additionally, there was some internal inconsistency in the positive affect items on the post-examination scale ($\alpha = .686$), introducing measurement uncertainty.

Suggestions for Future Research

Larger and more diverse samples are needed in future studies; procedures for recruitment and ethics are to be fully reported, and confirmation of demographic coding before analysis. Longitudinal studies on PAC and affect should include measures of task value and differentiate between trait-like academic control versus control appraisals of activities. Researchers could examine affect by having momentary or short, clearly defined recall instructions before and after assessments, preferably with multiple measures on examination and non-examination days. Such designs would also help to distinguish the emotional fluctuations from retrospective reappraisal, and would provide greater temporal ordering. Further psychometric evaluation of PAC in local university samples would be beneficial, especially if there is low internal consistency. Academic programs may wish to investigate supports for students' sense of agency, but benefits of intervention should be explored rather than assumed based on these findings.

Conclusion

In Study 1, higher perceived academic control was associated with higher positive affect and lower negative affect among university students. These findings are consistent with theoretical arguments in which control beliefs are hypothesized to have an impact on emotion, but they are not causal. Reported negative affect was lower at the later assessment day in Study 2, and evidence for a positive-affect difference was mixed. The conclusions that could be drawn are restricted to the associations and differences measured, as the recall periods were almost entirely overlapping and there was no causal design.

Declaration of Generative AI and AI-Assisted Technologies

During preparation of this manuscript, OpenAI's ChatGPT assisted with bibliographic cross-checking, language editing, APA 7 presentation, and critical editorial review of the interpretation of the reported results.

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