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**Bored and Frustrated with Online Learning? Understanding Achievement**

**Emotions from a Social Cognitive, Control-Value Perspective**

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Abstract

Using social cognitive, control-value theory as a theoretical framework, the objective of the present study was to investigate how students' cognitive appraisals (task value and self-efficacy) are related to their negative achievement emotions (boredom and frustration) within an online course. Service academy undergraduates ( $n = 481$ ) completed a survey that assessed their cognitive appraisals and negative achievement emotions. Consistent with expectations, Pearson correlations indicate that task value and self-efficacy were significantly related to each other and to students' negative achievement emotions. Additionally, regression results reveal that task value and self-efficacy were significant negative predictors of boredom and frustration. Theoretical considerations, educational implications, and future directions are discussed.

## Bored and Frustrated with Online Learning? Understanding Achievement

### Emotions from a Social Cognitive, Control-Value Perspective

Research in online education has traditionally been dominated by comparison studies; that is, investigations which compare the effectiveness of online education with that of conventional classroom instruction. On the whole, these studies have found no significant differences between the learning outcomes of online and traditional students (e.g., Berge & Mrozowski, 2001; Bernard et al., 2004; Zhao, Lei, Yan, Lai, & Tan, 2005).

Recently, there has been a call for a new paradigm of research in online education. Specifically, online learning experts have encouraged researchers to move beyond between-group studies (online versus traditional learning) and to focus instead on within group differences among distance learners (Abrami & Bernard, 2006; Bernard et al., 2004). The purpose of the present study was to begin addressing this under-researched area by examining the relations between learners' cognitive appraisals (task value and self-efficacy) and their negative achievement emotions (boredom and frustration) in the context of an online course.

### Theoretical Framework

Although student emotions have historically been considered an important part of many motivational theories (Schunk, Pintrich, & Meece, 2008), the role of emotions have been largely ignored in contemporary social cognitive theories of motivation (Linnenbrink & Pintrich, 2002, 2004). Two notable exceptions are Weiner's (1985) work on attribution theory and the plethora of test anxiety research that has been conducted over the last 30 years (Schunk et al., 2008).

In recent years, however, several researchers (e.g., Goetz, Pekrun, Hall, & Haag, 2006; Linnenbrink & Pintrich, 2002, 2004; Pekrun, Elliot, & Maier, 2006; Pekrun, Goetz, Titz, & Perry, 2002) have acknowledged the importance of achievement-related emotions and their

influence on cognitive engagement and processing, and have begun integrating them into theories of self-regulation. For instance, Pekrun (2000, 2006) has developed a social cognitive, control-value theory of achievement emotions that outlines hypothesized linkages between students' emotions and their learning and achievement. According to Pekrun's theory, positive achievement emotions, such as enjoyment and hope, and negative emotions, such as boredom and anger, are determined, in part, by students' cognitive appraisals. "Two categories of cognitive appraisals are proposed as central to the development of academic emotions: subjective control and subjective values of achievement-related actions, topics, and outcomes" (Goetz et al., 2006, p. 291). Both subjective control (i.e., self-appraisals of competence such as self-efficacy beliefs) and subjective values (i.e., self-appraisals of task value and importance) are thought to mediate the relations between aspects of the environment and achievement emotions (Pekrun, 2000, 2006).

Using Pekrun's (2000, 2006) social cognitive, control-value theory as a framework, several studies with university students in traditional classrooms have found that achievement emotions are related in significant ways to measures of students' academic success (Pekrun et al., 2002). In particular, negative achievement emotions (e.g., boredom and anger) correlated negatively with motivational variables (e.g., interest and effort) and measures of learning strategies use (e.g., elaboration and metacognition); whereas positive emotions (e.g., enjoyment and hope) related positively to these same outcomes. In a more recent study, Pekrun et al. (2006) found that adaptive components of students' motivational beliefs (i.e., their mastery goals) were negative predictors of anger and boredom and positive predictors of enjoyment and hope.

Aside from the research described above, a review of the literature revealed very few empirical studies that have directly examined how achievement emotions are promoted in

academic settings. Moreover, limited findings from traditional classrooms have suggested that there may be a “complex interplay among affect, cognition, and motivation that needs to be further investigated” (Linnenbrink & Pintrich, 2004, p. 83).

#### Purpose of the Study

The purpose of the present study was to begin addressing the complex interplay among achievement emotions, cognition, and motivation, as described by Linnenbrink and Pintrich (2002, 2004). In particular, this study was designed to determine how students’ cognitive appraisals (task value and self-efficacy) are related to two negative achievement emotions (boredom and frustration) in the context of a self-paced, online course in the military. Self-paced, online courses are a specific type of online training in which students use a Web browser to access a course management system and complete Web-based courses at their own pace. While completing these courses, students do not interact with an instructor or other students.

This study focused on *negative* achievement emotions because earlier work with a similar sample revealed that many students had negative feelings about online training (Artino & McCoach, 2007). In the present study, it was hypothesized that students’ perceived task value and self-efficacy would be negatively related to their boredom and frustration. Furthermore, after controlling for course grade and student demography (gender and age), it was hypothesized that task value and self-efficacy would be significant negative predictors of students’ boredom and frustration.

## Method

### *Participants*

Participants included a convenience sample of 481 undergraduates from a U.S. service academy. The sample included 398 men (83%) and 83 women (17%). The mean age of the participants was 20.5 years ( $SD = 1.0$ ; range 19-24).

### *Instructional Materials*

The instructional materials consisted of a self-paced, online course developed by the U.S. Navy. The online course was the first part of a two-stage training program in flight physiology and aviation survival training that was required for all service academy undergraduates (sophomores and juniors). Upon successful completion of this online course, students advanced to the second stage of their training, which consisted of traditional instruction at a local training unit.

The online course was composed of four, 40-minute lessons. Each lesson included text, graphics, video, interactive activities, and end-of-lesson quizzes that consisted of 12 to 15 multiple-choice questions. Students who did not score at least 80% on any given quiz were required to return to the beginning of the lesson, review the material, and then retake the quiz. A student's final grade in the course was computed as the average of the four end-of-lesson quizzes.

### *Procedures*

Approximately one month after completing the online course, participants arrived at a local training unit for the face-to-face portion of their instruction. Prior to any classroom training, students were invited to complete an anonymous, self-report survey. Participation in the survey was completely voluntary; 100% of students completed the survey.

### *Instrumentation*

The survey was composed of 50 items with a response scale ranging from 1 (*completely disagree*) to 7 (*completely agree*). Four subscales were used in the present study. Two subscales were adapted from Artino and McCoach (2007) and assessed two types of cognitive appraisals: (1) a six-item *task value* subscale designed to assess students' judgments of how interesting, useful, and important the online course was to them; and (2) a five-item *self-efficacy* subscale designed to assess students' confidence in their ability to learn the material presented in a self-paced, online format. The two remaining subscales were adapted from the work of Pekrun et al. (2002) and assessed two types of negative achievement emotions: (1) a five-item *boredom* subscale intended to assess students' course-related boredom; and (2) a four-item *frustration* subscale designed to assess students' course-related frustration, annoyance, and irritation.

## Results

### *Exploratory Factor Analysis*

Prior to conducting any statistical analyses aimed at answering the primary research question, a principal axis factor analysis with oblique rotation (Oblimin;  $\delta = 0$ ) was completed on the 20 items that made up the four hypothesized subscales (Preacher & MacCallum, 2003).

The number of factors to extract was determined on the basis of two criteria: examination of the resulting scree plot and eigenvalues greater than 1.0 (Hayton, Allen, & Scarpello, 2004). Results from both criteria suggested that four factors should be retained; the four extracted factors accounted for 64.7% of the total variance in the items.

Several rules were then used to determine the number of factors and individual items to be retained in the final solution: (1) factors needed to contain at least three items; (2) all factor

pattern coefficients needed to be  $> |.50|$  on at least one factor; and (3) items with factor pattern coefficients  $\geq |.30|$  on more than one factor were dropped (see recommendations in Pett, Lackey, & Sullivan, 2003). Using these guidelines, four factors were retained in the final solution; they included: (1) a six-item *task value* subscale ( $\alpha = .89$ ); (2) a five-item *self-efficacy* subscale ( $\alpha = .92$ ); (3) a four-item *boredom* subscale ( $\alpha = .85$ ); and (4) a three-item *frustration* subscale ( $\alpha = .89$ ). Internal reliability estimates (Cronbach's alpha) for the subscales were quite good (Gable & Wolfe, 1993).

### *Descriptive Statistics*

Table 1 presents descriptive statistics for the measured variables. As indicated, the two independent variables (task value and self-efficacy) had means slightly above the midpoint of the response scale (4.87 and 5.32, respectively) and standard deviations of 1.04 and 1.10, respectively. Both variables showed a slight negative skew. Descriptive statistics for the two dependent variables (boredom and frustration) indicate a mean just below the midpoint of the response scale (3.99 and 3.36, respectively) and a standard deviation of 1.29 and 1.44, respectively. The frequency distribution for the boredom variable was slightly negatively skewed, while the distribution for the frustration variable had a slight positive skew.

Cross-tabulation analyses were conducted to determine the number of students who scored above the midpoint of the response scale for the boredom and frustration variables. Results yielded four unique subgroups of students: the largest group was comprised of 211 students (43.9%), who did not meet the criterion for either boredom or frustration; the second largest group was comprised of 133 students (27.6%) who reported being bored; the third largest group (105 students; 21.8%) reported being both bored and frustrated; and the smallest group (32 students; 6.7%) met the criterion for frustration. In short, the majority of students in this study

indicated being bored and/or frustrated with their online course, with most being bored rather than frustrated.

Table 1

*Descriptive Statistics, Cronbach's Alphas, and Pearson Correlations for the Measured Variables*

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	Subscale Items	$\alpha$	1	2	3	4
1. Task Value	481	4.87	1.04	6	.89	–	.34	-.44	-.40
2. Self-Efficacy	481	5.32	1.10	5	.92		–	-.29	-.29
3. Boredom	481	3.99	1.29	4	.85			–	.61
4. Frustration	481	3.36	1.44	3	.89				–

*Note.* Variables are measured on a 7-point Likert scale. All correlations are significant at the  $p < .001$  level.

### *Pearson Correlations*

Table 2 also presents results from the correlation analysis. As indicated, task value and self-efficacy were significantly related to each other ( $r = .34, p < .001$ ) and to students' negative achievement emotions. As expected, the extent to which students valued the online learning tasks was negatively related to their boredom ( $r = -.44, p < .001$ ) and frustration ( $r = -.40, p < .001$ ) with the online course. Likewise, students' self-efficacy was negatively related to their boredom ( $r = -.29, p < .001$ ) and frustration ( $r = -.29, p < .001$ ). Overall, these results indicate that when considered individually, students' cognitive appraisals explained from 8 to 19% of the variance in their negative achievement emotions; moderate effect sizes (Cohen, 1988).

### *Regression Analyses*

To explore the unique variance explained by students' cognitive appraisals on their negative achievement emotions—after controlling for course grade and demography—two

multiple regressions were conducted. In these analyses, boredom and frustration were used as dependent variables; course grade, gender, age, task value, and self-efficacy served as the independent variables. Results from the first analysis indicate that the five predictors accounted for approximately 22% of the variance in students' boredom,  $F(5, 470) = 26.85, p < .001$ ; a moderate effect (Cohen, 1988). After controlling for the other variables in the equation, task value ( $\beta = -.38, p < .001$ ) and self-efficacy ( $\beta = -.17, p < .001$ ) were both significant negative predictors of boredom. Results from the second analysis indicate that the five predictors accounted for approximately 20% of the variance in students' frustration,  $F(5, 470) = 39.01, p < .001$ ; again, a moderate effect (Cohen, 1988). As before, both task value ( $\beta = -.32, p < .001$ ) and self-efficacy ( $\beta = -.18, p < .001$ ) were significant individual predictors of the outcome. It is worth noting that in both regression analyses, none of the control variables were significant individual predictors of the dependent variables.

### Discussion

According to Pekrun et al. (2006), "achievement emotions are important for students' engagement, performance, and well-being, as well as for their personal growth and agency more generally" (p. 593). Given the practical significance of achievement emotions, the purpose of the present study was to investigate how two cognitive appraisals—task value and self-efficacy beliefs—are related to students' negative achievement emotions in the context of a self-paced, online course in the military.

Taken together, findings from the present study provide support for Pekrun's (2000, 2006) social cognitive, control-value theory. Specifically, when considered alone, task value was negatively correlated, as expected, with students' boredom and frustration with the online course. Additionally, after controlling for the other variables in the equation, task value was a significant

negative predictor of students' negative achievement emotions. Thus, it appears that students who believed the course was interesting and important were less likely to become bored and frustrated with the online materials. Likewise, students' self-efficacy for learning online—when considered alone and after parsing out the effects of the other independent variables—was negatively related to students' boredom and frustration. This finding suggests that students who were confident they could learn the material presented in a self-paced, online format were also less likely to become bored and frustrated with those same online materials.

### Conclusions

Overall, these findings support the empirical work of Pekrun and his colleagues (e.g., Pekrun et al., 2006; Pekrun et al., 2002) suggesting that students' cognitive appraisals are important proximal determinants of achievement emotions. Among the many categories of cognitive appraisals that may be relevant, Pekrun (2000, 2006) has suggested that two appraisals are most important in achievement contexts: the subjective value of achievement activities, and the perceived controllability of those activities, as indicated by competence perceptions. Notwithstanding the methodological limitations of the present investigation, results seem to support this theoretical perspective. Moreover, these results suggest that although boredom and frustration are distinct achievement emotions, both seemed to be explained in approximately equal measure by students' task value and self-efficacy beliefs.

The present findings also indicate that negative achievement emotions are quite prevalent among students learning online. Therefore, future research should continue to explore the relationships between students' cognitive appraisals, their negative achievement emotions, and, ultimately, their academic achievement in online settings (Schunk et al., 2008). Moreover, future work should investigate whether instructional interventions designed to positively impact

students' task value and self-efficacy beliefs can also improve their achievement emotions and academic performance in these highly independent, online learning situations.

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