



Examining the factor structure and validity of the English Precursors to Boredom Scales



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ABSTRACT

The primary goal of this study was to investigate the factor structure and validity of the English Precursors to Boredom Scales (E-PBS) in a sample of Canadian college students. Findings showed that the factor structure and item loadings of the E-PBS were comparable with those published on German samples. In addition, the present study examined criterion-related evidence between the E-PBS and students' self-efficacy for self-regulated learning (SESRL) and achievement. Our results showed negative associations between SESRL and four antecedents to boredom (i.e., being bored due to over-challenged, lack of meaning, opportunity costs, and general boredom tendency), whereas only one significant correlation—between being under-challenged and students' achievement—emerged.

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Students experience academic boredom more frequently than any other negative emotion (Pekrun, Goetz, Daniels, Stupnisky, & Perry, 2010). Academic boredom is highest when students are learning abstract subjects in passive ways (Larson & Richards, 1991)—a combination that many large undergraduate classes fall victim to by presenting abstract materials through didactic lectures. Perhaps it is not surprising then that about 58% of college students perceive more than half of their courses as boring (Mann & Robinson, 2009) and by extension not only experience unpleasant feelings but also have a strong desire to withdraw from a situation. It is this desire to escape that distinguishes boredom from more neutral experiences such as lack of interest and makes boredom a debilitating emotion (e.g., Pekrun et al., 2010). The debilitating nature of boredom is the impetus for the current research that seeks to confirm the structure of a measurement tool to assess the precursors or causes of boredom.

1. Theoretical perspective on boredom

We used the control-value theory of emotion (Pekrun, 2006) to examine boredom because it focuses on both antecedents and outcomes of emotions and can therefore help identify sources of emotions that may be manageable by teachers, students, or the design of academic programs. In Pekrun's framework, academic boredom refers to an unsettling and tedious emotion experienced when academic activities are either far beyond or below students' capabilities (e.g., Goetz,

Pekrun, Hall, & Haag, 2006). Additionally, boredom is induced if there is low subjective value of academic-related activities (Pekrun, Goetz, Frenzel, Barchfeld, & Perry, 2011). In other words, boredom arises in response to low or high control and low value in a learning situation—a finding supported by both Canadian and German data (Pekrun et al., 2010). Instructors may knowingly or unknowingly create situations of high or low control and value. For example components of a learning environment such as instructional quality or enthusiasm are positioned as distal causes of academic emotions in Pekrun's theory because they are the basis for students' control and value appraisals. Thus these types of variables provide an excellent source of information on construct validity related to causes of boredom. By extension, boredom may exert an effect on objective outcomes such as achievement as well as subjective experiences like efficacy. Thus these types of variables provide an excellent source of criterion validity for precursors of boredom.

2. Causes of boredom

To systematically investigate precursors to boredom in school settings, Daschmann, Goetz, and Stupnisky (2011) borrowed from the literature on boredom at work and developed the Precursors to Boredom Scales (PBS). The PBS includes eight theoretically and empirically distinguishable precursors to boredom: being over-challenged (over-challenge), being under-challenged (under-challenge), being bored by an unchanging routine (monotony), not finding meaning in learning (lack of meaning), having better things to do than be in class (opportunity costs), disliking the teacher (teacher dislike), feeling uninvolved (lack of involvement), and being bored by the general situation

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(general boredom tendency). Each precursor theoretically exerts a different impact on students' academic behaviors.

The structural and construct validity of the PBS (Daschmann et al., 2011) was evaluated using multi-level confirmatory factor analysis and comparing three models: a one-factor model with all causes loaded on one latent factor, an eight-factor model with discrete latent causes of boredom, and a higher-order model with eight latent causes loaded on one common latent construct. The eight-factor model demonstrated the best fit with data and was retained. Next, Daschmann et al. examined how the scale related to various measures of instructional quality. They found that all precursors except under-challenge correlated positively with poor quality of instruction (e.g., punishing for failure), and negatively with enthusiasm, practical application, and usefulness of learning.

Because the PBS was conceptually based on broad categories of causes for work-related boredom (e.g., Martin, Sadlo, & Stew, 2006) the items are largely non-specific to age groups or populations. There is little reason to think that the content of the items measuring the causes of boredom would be inappropriate for college students. Supporting this, Conard (1997) found that when college students were asked about boredom in lectures they suggested it was because of “under-stimulation”, “hav[ing] no knowledge about [the content]”, seeing “no point”, “repetitive” format, and general sense of it being “a waste of time” (p. 471–472). These causes of boredom correspond to Daschmann and colleagues' factors of being under-challenged, being over-challenged, lack of meaning, monotony, and opportunity costs (see Mann & Robinson, 2009 for similar parallels). Therefore, although the PBS was developed to measure causes of boredom in young students its underlying dimensions are applicable to university settings.

3. Outcomes of boredom

Boredom is negatively associated with students' educational development (Pekrun et al., 2010) including dropping out (Wegner, Flisher, Chikobvu, Lombard, & King, 2008), juvenile delinquency (Newberry & Duncan, 2001), truancy (Sommer, 1985), and increased suspension rates in gifted students (Kanevsky & Keighley, 2003). Two proximal outcomes may be SESRL and achievement. SESRL is defined as one's beliefs about using self-regulated learning strategies for academic success (Pajares, 2002; see also Zimmerman, 1989, 1994). SESRL would be classified as an outcome of boredom, specifically motivation to learn, in Pekrun's (2006) theory. Although research has shown that boredom is negatively associated with self-efficacy (e.g., Artino, La Rochelle, & Durning, 2010) and self-regulated learning strategies (e.g., Pekrun, Goetz, Titz, & Perry, 2002; Pekrun et al., 2011), it is important to take into consideration an individual's confidence to regulate his or her learning (Pajares, 2002; Zimmerman, Bandura, & Martinez-Pons, 1992). In particular, being equipped with regulatory skills in learning is insufficient to succeed (Zimmerman et al., 1992); students also need to have efficacy beliefs to monitor and evaluate their progress, put effort into accomplishing the task, and apply appropriate strategies to attain their goals (Bandura, 1986). These reasons together make it important to consider SESRL in relation to boredom, and more specifically the causes of boredom. Given that efficacy extends from mastery experiences (Bandura, 1994), such experiences may be lacking in an achievement setting characterized by high control. It is expected that sources of boredom related to high control and low value may have negative influence on SESRL.

Furthermore, the experience of academic boredom has a surprisingly large negative correspondence with achievement. Across several studies the correlation between boredom and achievement, measured by final grades or GPA, appears to be between $-.15$ and $-.32$ (Daniels et al., 2008, 2009; Pekrun et al., 2010, 2011). Specific to causes of boredom, Daschmann and her colleagues (2011) found that lack of meaning, opportunity costs, over-challenge, lack of involvement, teacher dislike, and general boredom tendency correlated negatively with

achievement. Their findings suggest the importance of managing students' perceived causes of boredom in order to potentially alleviate its negative impact on achievement. However, most research on boredom has been cross-sectional rendering it impossible to determine the direction of the relationship between boredom and achievement. As much as achievement may impact boredom so too are there other precursors that need to be identified and these are the focus of the current research.

4. Purposes of the studies

Because the PBS was developed in Germany with students in Grades five to 10, its generalizability to other populations needs to be established. Therefore, we designed two studies that focused on precursors to boredom. In Study 1 we evaluated the psychometric properties and construct validity of the English Precursors to Boredom Scales (E-PBS) in a sample of Canadian undergraduate students. We also compared the E-PBS to the original PBS with German students to determine equivalence across the groups. In Study 2 we replicated the factor structure and examined criterion-related evidence between specific precursors to boredom and SESRL and academic achievement.

5. Study 1

We tested the validity of the E-PBS in a Canadian college sample by examining its factor structure, internal consistency, and construct validity. We expected that the E-PBS would demonstrate the eight-factor structure reported in Daschmann et al. (2011) and be invariant with this original sample. We included three components of the learning environment on which students base their control and value appraisals as validity measures: enjoyment, instructional quality, and agitation. We expected (1) negative correlations between enjoyment of class and monotony, opportunity costs, and lack of involvement, (2) all precursors to correlate positively with the measure of poor quality of instruction and (3) positive correlations between agitation and boredom due to over-challenge, lack of meaning, dislike of the teacher, and general boredom tendency.

5.1. Method

5.1.1. Participants and procedure

A total of 274 Canadian university students (21% males and 73% females, with 6% not reporting their gender) completed one online questionnaire requiring approximately 30 min. Participants were part of a participant pool, were invited through class announcements, and received research credit. Participants could stop the survey at any time without penalty and instructors had no access to study. Although the survey had several questionnaires, only those related to the E-PBS and the validation constructs (enjoyment, instructional quality, and agitation) were used in these analyses. Of the 274 participants, there was 6% missing data. Participants' ages ranged from 18 to 52 years old ($M = 23.13$, $SD = 5.50$).

5.1.2. Translation process

The translation of the German PBS (Daschmann et al., 2011) to English followed conventional procedures (e.g., van de Vijver & Leung, 1997): It was translated into English by bilingual experts and then back translated by different bilingual researchers to ensure that the meaning and content were equivalent to the original scale.

5.2. Measures

5.2.1. Precursors to boredom

The translated Daschmann et al.'s (2011) PBS was used to measure eight precursors to boredom through 22 items. A common statement (i.e., “When I am bored in class it is because ...”) was followed by causes of boredom (e.g. “the subject matter is too difficult for me.”).

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