



## Students' emotions during homework: Structures, self-concept antecedents, and achievement outcomes

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### ARTICLE INFO

#### Article history:

Received 6 July 2010

Received in revised form 13 October 2010

Accepted 18 April 2011

#### Keywords:

Academic emotions

Enjoyment

Pride

Anxiety

Anger

Boredom

Academic self-concept

Academic achievement

Homework

### ABSTRACT

In the present study ( $N = 553$ ; 8th and 11th grade students; 52% female) we investigated students' enjoyment, pride, anxiety, anger, and boredom while completing homework (homework emotions), and contrasted these emotions with those experienced during class (classroom emotions). Both homework emotions and classroom emotions were assessed separately for the domains of mathematics, physics, German, and English. Our hypotheses were based on propositions of the control-value theory of achievement emotions (Pekrun, 2006), Marsh and Ayotte's (2003) differential distinctiveness hypothesis, and previous empirical findings. In line with our assumptions, observed correlations between homework emotions and classroom emotions suggested that the emotions experienced in the two settings should be assessed separately. Within domains, both homework emotions and classroom emotions showed clear linkages with students' academic self-concept and achievement outcomes, with self-concept being slightly more strongly related to classroom emotions. Between-domain relations of emotions were significantly stronger for homework emotions as compared to classroom emotions, likely due to the relative situational homogeneity of homework settings across domains. Further, between-domain relations for emotions in both settings were weaker in 11th grade students, whereas within-domain relations did not differ as a function of age. Implications for research and educational practice are discussed.

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### 1. Introduction

*"The chief motive of human actions lies in feelings and emotions. If education is to secure certain actions, the safest way will be by developing certain likes and dislikes, pleasures and displeasures, enthusiasms and aversions"* (Muensterberg, 1910, p. 196).

Despite early recognition of the importance of emotions in the psychology of learning and achievement, educational research has largely neglected students' emotional experiences with the exceptions of extensive research on test anxiety since the 1950s (Sarason & Mandler, 1952; Zeidner, 1998, 2007) and on emotions in achievement settings based on attribution theory (see Weiner, 1985, 2001). Over the past decade, however, theoretical and empirical contributions on

academic emotions, defined as "emotions that are directly linked to academic learning, classroom instruction and achievement" (Pekrun, Goetz, Titz, & Perry, 2002, p. 92), have increased significantly as reflected in a number of recent special issues and edited volumes (Efklides & Volet, 2005; Linnenbrink, 2006; Linnenbrink-Garcia & Pekrun, 2011; Lipnevich & Roberts, 2011; Schutz & Lanehart, 2002; Schutz & Pekrun, 2007). Academic emotions have been investigated with respect to specific contexts (e.g., school, class; see Goetz, Hall, Frenzel, & Pekrun, 2006), age groups (e.g., middle and high-school students), and subject domains (e.g., mathematics, languages; see Goetz, Frenzel, Pekrun, Hall, & Lüdtke, 2007). However, while the majority of this research has focused on emotions in the classroom (i.e., classroom emotions as a subgroup of academic emotions), few studies have investigated students' discrete emotional experiences in *homework situations* (Knollmann & Wild, 2007; Mayring & von Rhoneck, 2003).

Despite a lack of research exploring homework-related academic emotions as defined in the present study, there exist a number of studies exploring emotion-related psychosocial constructs in the context of homework completion (e.g., interest, Xu, 2008; regulation

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of emotions, Xu, 2005a; Xu & Corno, 2006; affective components of attitudes, Cooper, Lindsay, Nye, & Greathouse, 1998). Further, in the few studies evaluating both homework and classroom emotions, mean level differences in affective experiences between these academic settings are primarily assessed (e.g., Leone & Richards, 1989; Verma, Sharma, & Larson, 2002). As such, the structural relationships between homework and classroom emotions, and between emotions within the homework domain, have yet to be explored. In other words, there exists little research to date providing empirical support for the conceptual differentiation between students' emotions experienced in class as compared to homework settings (for work on learning-related versus classroom emotions in university students, see Pekrun, Goetz, Frenzel, & Perry, 2011). Existing research on homework emotions also does little to account for domain-related differences in relations among homework emotions (e.g., mathematics vs. language courses), in spite of studies showing academic emotions to be largely domain specific in nature (Goetz et al., 2007). These research gaps are particularly intriguing considering the substantial proportion of study time accounted for by homework assignments (Cooper, 1989, 2007; Cooper et al., 1998; Xu, 2005b) and the significant impact of quality of homework assignments on achievement outcomes (Dettmers et al., 2011; Dettmers, Trautwein, Lüdtke, Kunter, & Baumert, 2010).

The present study aims to redress these research deficits by exploring students' academic emotions in both homework and classroom settings while accounting for the largely domain-specific organization of students' emotional experiences. The study hypotheses were derived from theories of both academic emotions and homework (e.g., Pekrun, 2006; Trautwein, Lüdtke, Schnyder, & Niggli, 2006) and evaluated in a high-school student sample. The specific academic emotions assessed included enjoyment, pride, anxiety, anger, and boredom as experienced in the subject domains of mathematics, physics, German, and English. The study analyses evaluated the strength of relations between homework and classroom emotions, and the relations between these emotions and two important variables functioning as antecedents and outcomes, respectively (self-concept of ability and academic achievement). Finally, we also investigated the differences between homework and class-related emotions with respect to structural relations between emotions across subject domains (e.g., enjoyment in mathematics vs. English) and within subject domains (e.g., enjoyment and anxiety in mathematics).

### 1.1. Homework and classroom emotions: similarities and differences

Homework assignments are largely completed on an independent basis and typically defined as "tasks assigned to students by school teachers . . . to be carried out during non-school hours" (Cooper, 1989, p. 7). In contrast, classroom activities involve instruction, group work, individual work, and testing conducted in a school setting in the presence of classmates and teachers (e.g., Brophy & Good, 1986; Butler, 1989). Further, whereas homework activities are often self-regulated, classroom learning is generally more structured in nature and externally as well as professionally regulated (Zeidner, Boekaerts, & Pintrich, 2005).

In Pekrun's (2006) control-value theory of achievement emotions, it is posited that cognitive appraisals of control and value (proximal antecedents) mediate the impact of the environment (distal antecedents) on academic emotions. Consistent with the situational generality of Pekrun's (2006) theoretical propositions, it can be assumed that the impact of perceived control and value on emotions is equivalent across homework and classroom situations (see Goetz, Frenzel, Stoeger, & Hall, 2010, for empirical evidence). In other words, a basic assumption of this theory is that the *structural relationships* between these psychosocial constructs should be similar across situational contexts despite possible differences in mean levels. For example, although *mean levels* of control and enjoyment may differ between homework and classroom situations, the *strength of control/enjoyment relations* is assumed to be similar in both situational contexts (cf., universality assumption as outlined in

Frenzel, Pekrun, & Goetz, 2007; Pekrun, 2009). However, according to this theory it is also possible that differences in distal antecedents (i.e., social environment; see Trautwein, Lüdtke, Kastens, & Köller, 2006) between these settings could lead to different emotional experiences. In this regard, Pekrun (2006) outlines five critical antecedents of students' emotions that may indeed differ as a function of homework versus classroom settings including (a) quality of instruction, (b) induction of values, (c) autonomy support, (d) goal structures and expectancies of others, as well as (e) achievement feedback and consequences.

Nevertheless, it is possible that more similarities than differences exist in these categories with respect to homework vs. classroom situations. More specifically, the quality of homework assignments often reflects the quality of classroom instruction (cf., Cooper, 1989; Dettmers et al., 2010), values that teachers wish to convey, degree of autonomy afforded to students, as well as goal structures and expectancies that are outlined either implicitly or explicitly in the classroom setting. This assumption is consistent with the findings of Trautwein, Niggli, Schnyder, and Lüdtke (2009) demonstrating the impact of teacher characteristics as reflected in homework assignments on students' emotions concerning homework activities. In this study, the findings showed students to report more negative homework emotions in classes with greater teacher control over homework assignments. Conversely, factors such as achievement feedback are likely to be less salient in homework as compared to classroom settings.

Given the assumed preponderance of similarities as opposed to differences with respect to the antecedents of students' emotional experiences in homework versus classroom settings, it can be assumed that the relations between homework and classroom emotions are moderate to strong in magnitude. This assumption is consistent with studies by Pekrun et al. (2011) and Pekrun et al. (2002) in which the mean correlations between university students' class-related and learning-related emotions (outside of class) were in the magnitude of  $r = .65$ . However, it is important to note that the relations observed in a higher education setting may differ for secondary school students for whom homework assignments are more externally structured.

### 1.2. Homework and classroom emotions: self-concept and achievement relations

In their classic and highly influential review, Shavelson, Hubner, and Stanton (1976) broadly defined *self-concept* as self-perceptions formed through experience and interpretations of one's environment (see also Marsh & O'Mara, 2008). These self-perceptions are further assumed to be especially influenced by evaluations of significant others, reinforcements, as well as attributions for one's own behavior. Self-concept represents a critical indicator of control appraisals (Pekrun, 2006) and has been found to have a moderate to strong impact on academic emotions (Goetz, Cronjaeger, Frenzel, Lüdtke, & Hall, 2010; Goetz, Frenzel, et al., 2010; Goetz, Frenzel, Hall, & Pekrun, 2008). Numerous studies also provide empirical support for the effects of academic emotions on *achievement outcomes* (e.g., Goetz et al., 2007 for classroom emotions; Trautwein, Schnyder, Niggli, Neumann, & Lüdtke, 2009 for homework emotions), likely due to their demonstrated effects on cognitive, motivational, and regulatory processes (Pekrun, in press).

Concerning differences in self-concept/emotion and emotion/achievement relations with respect to homework vs. classroom settings, stronger relations for classroom emotions are assumed for academic self-concept as social comparisons might be assumed to be more salient in competitive classroom settings (cf., Goetz, 2004; for homework settings see Knollmann & Wild, 2007; Shavelson et al., 1976). In contrast, the relations between emotions and achievement are anticipated to be more similar between the two settings due to similar effects of emotions on learning behavior and cognitive performance in each achievement situation. However, there exists to date no published empirical research evaluating the relative strength of self-concept/emotion and emotion/achievement relations across homework versus classroom settings.

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