ACHIEVEMENT EMOTIONS IN SECOND LANGUAGE LEARNING

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Abstract

The goal of this dissertation was to examine achievement emotions together with their antecedents and outcomes in English classes. Based on the control-value theory (Pekrun, 2006), I investigated the associations among one distal antecedent (perceived peer emotion), two proximal antecedents (control and value appraisals), achievement emotions and language outcomes in three large-scale quantitative studies. Study 1 examined the psychometric properties of an adapted learning-related Achievement Emotion Questionnaire (AEQ; Pekrun et al., 2011) measuring eight emotions (enjoyment, pride, hope, boredom, anger, anxiety, hopelessness and shame) in a second language (L2) context. The scales were tested in two samples comprising 1021 Chinese freshmen, who learned English as a foreign language. Results indicated that the instrument is reliable, internally valid as demonstrated by fit indices obtained from single- and multiple-group confirmatory factor analysis, and externally valid in terms of relationships with language motivation and performance. Study 2 examined independent and interactive effects of control and value appraisals on achievement emotions and L2 performance as well as the conditional indirect effects of appraisals on achievement through emotions. Five hundred and fifty Chinese college students completed appraisal measures, emotion questionnaires and the course exam in a longitudinal manner across one semester. Findings showed that control and value appraisals correlated positively with positive emotions and L2 performance and negatively with negative emotions, except anxiety. Control and value interacted to predict all eight emotions and L2 performance in expected directions. Importantly, the multiplicative impact of appraisals on L2 performance was also mediated by four of the focal emotions. Study 3 explored whether perceived peer enjoyment, anxiety and boredom positively predict students' corresponding enjoyment, anxiety and boredom as well as whether the relationships between perceived peer and student emotions are mediated by

control-value appraisals (Parkinson & Manstead, 2015; Pekrun, 2006). Data were collected from 3643 Chinese middle-school students nested in 103 classrooms. Multilevel structural equation modeling showed that perceptions of peer emotions and student corresponding emotions were positively related at both individual and classroom levels. Moreover, the effects of perceived peer emotions on corresponding student emotions were mediated by control and value appraisals at the individual level. However, the mediation effects were only significant at the class level for control appraisal as a mediator of effects on anxiety, and for value appraisal as a mediator of effects on boredom. Effects were robust across grade level, gender, and previous achievement. In sum, findings from the three studies help to elucidate the role of emotions in educational settings and provide support for the generalizability of control-value theory in the second language context. Directions for future research and implications for theory and language instruction are also discussed.

Table of Contents

List of Tables

Study 1

Study 2

Study 3

List of Figures

Study 1

Study 2

Study 3

Chapter 1. Introduction

The emotions that students experience in educational contexts have attracted increasing attentions in recent years. Achievement emotions can impact on students' academic learning and performance by changing brain dopamine levels affecting long-term memory, by directing attentional processes and the use of cognitive resources, by inducing and sustaining student interest in learning material, by triggering different modes of information processing and problem solving, and by facilitating or impeding students' self-regulation of learning and performance (Pekrun et al., 2002; 2006). Given the clear relevance of achievement emotions for student learning and performance, it is important to acquire information on the antecedents of students' emotions so that recommendations can be derived for how teacher instruction and classroom environments can be shaped in "emotionally sound" (Astleitner, 2000) ways. The control-value theory (Pekrun, 2006) proposes that control and value appraisals of academic activities and outcomes are likely to play a major role in the arousal of achievement emotions. Perceptions of control and value are not only assumed to have independent effects on achievement emotions, but also jointly influence students' emotional experiences (Pekrun et al., 2007). Moreover, considering the influences of emotions on performance, the theory also posits that the effects of appraisals on emotions may in turn influence students' performance (Pekrun & Perry, 2014). Despite such propositions, it is surprising that very few studies investigated the interactive effects of perceived control and perceived value on achievement emotions (Goetz et al., 2010) and no studies have tested whether this combined effect of appraisals on student emotions would transmit to their performance. Therefore, one of the main goals of the present research was to examine the multiplicative impact of control and value appraisals on achievement emotions in second language classrooms. More importantly, it investigated whether the hypothesized interactive effects of control-value appraisals on

students' language performance will be mediated by achievement emotions.

Furthermore, to the extent that the underlying constructs of control and value appraisals follow the principle of domain specificity (e.g. Marsh, 1993), achievement emotions should also be organized in domain-specific manners (Pekrun & Perry, 2014). Nevertheless, past research has predominantly dealt with domain-general emotion variables (such as general test anxiety, see Zeidner, 1998) or with students' emotions related to math (e.g., Ahmed et al., 2010; Luo et al., 2014; Peixoto et al. 2016), and rarely examined how achievement emotions affect second language (L2) learning (Lee, 2014). In contrast to the current situation, however, it seems much more important to study the influence of emotions in second language classrooms because language learning itself is prone to create intense emotions (MacIntyre, 2002) and students' self-esteem may become vulnerable if they don't have the language skills necessary to express themselves (Horwitz, Horwitz, & Cope, 1986; Arnold, 2011). Indeed, second language researchers have long been aware of this issue (Scovel, 1978; Schumann, 1994) and there are a number of studies devoted to the relationship between anxiety and language learning (Argaman & Abu–Rabia, 2002; Dewaele, 2002; MacIntyre & Gardner, 1994; Shao, Yu, & Ji, 2013). Notwithstanding this important contribution, research on the role of other emotions in relation to L2 motivation and performance has unfortunately been hindered by the lack of theoretically-sound and empirically-validated instruments measuring different emotions during second language acquisition (Swain, 2013). In consideration of the fundamental importance of this issue to the field of second language learning, the present research made an initial attempt to adapt the learning-related scale of the Achievement Emotion Questionnaire (AEQ; Pekrun et al., 2011) to students' study of a second language, specifically, their English study, and test the construct validity of this instrument and the links between eight discrete emotions and students' language motivation and performance.

The control-value theory postulates that to the extent that control and value appraisals

function as proximal antecedents to achievement emotions, any distal antecedents should influence achievement emotions by affecting these appraisals in the first place (Pekrun et al., 2007). This indicates that control and value appraisals may serve as mediators between features of classroom environment such as peer and teacher emotions and student emotions. Importantly, the theory also acknowledges that peers and teachers may deliver messages which automatically influence achievement emotions, which may not always be mediated by conscious appraisals (Pekrun & Perry, 2014). These assumptions are in line with both the emotion contagion (Hatfield, Cacioppo, & Rapson, 1994) and the social appraisal (Parkinson & Manstead, 2015) accounts of interpersonal affect transfer. Specifically, the emotions of peers or teachers may both directly and indirectly affect students' emotional experiences in English classes. Recent classroom climate research has shown that teacher-student emotional interactions and teacher emotions are significant predictors of student emotions at both individual and classroom levels (Frenzel et al., 2009; Reyes et al., 2012). It is therefore tempting to think that peer emotions may exert even greater influences on student emotions since students spend the majority of time with peers in their school life. Moreover, investigating peer emotions at the classroom level has the potential to formulate pedagogical implications targeting the whole class, thus resulting in improvements for not only individual but every student in the class. To date, no research has examined the relationships between peer and student emotions in educational settings. The present research aimed at addressing this gap in the literature by exploring the emotion transfer between peers and students through ways of emotion contagion and social appraisals. It also examined whether control and value appraisals would play the role of mediators in the relationships between peer and student emotions.

In light of the above considerations, this dissertation is organized in the form of three separate studies which are logically connected by the theme of investigating the interplay between achievement emotions and their antecedents and outcomes in the second language

context. Specifically, Study 1 reports the reliability, internal validity and external validity of the English learning related Achievement Emotion Questionnaire containing eight emotion scales: enjoyment, hope, pride, anger, boredom, anxiety, shame, and hopelessness. Model fit parameters were tested both separately and collectively for the eight emotions across two samples. Correlations between achievement emotions, motivation and language performance are also described. Study 2 focuses on the relations between control-value appraisals, achievement emotions and L2 performance. In particular, both independent and interactive effects of control and value appraisals on the above eight focal emotions as well as on L2 performance were examined. Importantly, the conditional indirect effects of control and value appraisals on L2 performance through achievement emotions were also probed. Study 3 attends to the connections between peer and student emotions. In detail, the positive predictive effects of perceived peer enjoyment, anxiety and boredom on students' corresponding enjoyment, anxiety and boredom were examined. The proposed partial mediation effects of control and value appraisals in the relationships between perceptions of peer enjoyment, anxiety and boredom and students' corresponding emotions were also explored.

Since English is a required subject at all levels of education in China, students are likely to value the subject highly, and learning English could induce intense emotions. The systematic examination of achievement emotions in second language learning from a psychological perspective provides new insights on the origins and functions of students' emotions. These insights will help develop educational interventions to promote positive emotions, learning and performance. Therefore, I expect this dissertation to contribute to the scientific knowledge of psychology and second language pedagogy, as well as the practical improvement of instruction in language classes.

Chapter 2. Validating the Achievement Emotion Questionnaire-Language in a Chinese sample

Aside from the Foreign Language Classroom Anxiety Scale (FLCAS), measurement instruments assessing students' different emotions in language learning are largely lacking. This article reports the development, reliability, internal validity, and external validity of the Achievement Emotions Questionnaire-Language (AEQ-L) which was designed to assess various achievement emotions experienced by students in the second language context. The instrument measures eight emotions: enjoyment, hope, pride, anger, boredom, anxiety, hopelessness, and shame before, during, and after studying for the language. The scales were tested in two studies using a sample of university students (N = 1021). Findings indicated that the instrument is reliable, internally valid as demonstrated by confirmatory factor analysis, and externally valid in terms of relationships with students' motivation and language performance. The results help to elucidate the structure and role of emotions in educational settings and provide support for the utility of assessing discrete emotions in language learning. Directions for future research and implications for language pedagogy are discussed.

Key words: emotions, achievement, language, learning, instrument, validation

2.1 Introduction

Language classrooms abound with achievement emotions such as enjoyment of learning, hope, pride, anger, anxiety, shame, hopelessness, or boredom. These emotions are critically important for students' motivation, concentration, performance, identity development, and health (MacIntyre, 2002; Pekrun et al., 2014; Schumann 1994). Accordingly, the development and validation of research instruments which can be used to reliably measure students' discrete emotions in various language learning contexts (Arabic, Chinese, and Spanish etc) is the prerequisite for investigating students' emotions, their causes and effects, together with effective interventions. To date, there is a lack of such instruments measuring various achievement emotions that students commonly experience in language settings. Although the Foreign Language Classroom Anxiety Scale (FLCAS) is widely used by second language (L2) researchers, it assesses only one type of emotion (Horwitz et al., 1986; 2010). Recent development of the Achievement Emotions Questionnaire (AEQ) has shown to be a promising scale in terms of measuring students' diverse emotions across cultures, domain, languages, and settings etc (Pekrun et al., 2002; 2005; 2011), yet validation of the instrument in different subjects and languages is still sorely needed, especially in second language acquisition. To bridge these gaps, the present research makes an attempt to adapt the learning-related AEQ to the second language context. The AEQ-Language taps into eight different emotions occurring in the process of language learning. In the following sections, we first describe the theoretical conception underlying the AEQ and the construction of the instrument. Next, we discuss the validation of the AEQ, the influences of emotions on motivation and performance, and the current emotion research in second language learning. We then report two empirical studies testing item and scale statistics, reliability, internal validity, and external validity of the AEQ-Language.

2.2.1 Conceptual Framework of Achievement Emotions and Construction of the AEQ

Over the past 15 years, achievement emotion has received considerable attention within the scientific research of psychology and education. It refers to affective arousal that is tied directly to competence and value-relevant achievement activities or achievement outcomes (Pekrun & Perry, 2014). This conceptualization is guided by the control-value theoretical framework of achievement emotions which builds on the assumption that control and value appraisals are proximal determinants of emotions experienced by students in achievement settings (for details see Pekrun & Perry, 2014). The control-value theory provides an integrative approach for analyzing various emotions experienced in achievement contexts. The theory builds on assumptions from expectancy-value theories of emotions (Pekrun, 1992a; Turner & Schallert, 2001), transactional approaches (Lazarus & Folkman, 1984), attributional theories (Weiner, 1985), and models of the performance effects of emotions (Fredrickson, 2001; Pekrun, 1992b; Pekrun, Goetz, Titz, & Perry, 2002; Zeidner, 1998, 2007). It expands these views by integrating propositions from different theories and by focusing on both outcome-related and activity-related achievement emotions.

In a series of qualitative and quantitative studies, Pekrun and colleagues (2002) identified nine emotions (enjoyment, hope, pride, relief, anger, anxiety, shame, hopelessness, and boredom) which were most commonly endorsed by students in academic settings, yet largely neglected by emotion researchers except for anxiety. Based on these findings, a three-dimensional taxonomy of different emotions and a self-report instrument measuring students' achievement emotions were developed (Pekrun et al., 2005; 2006). Regarding the taxonomy, emotions were classified according to object focus (activity vs. outcome emotions), valence (positive vs. negative), and activation (activating vs. deactivating). The object focus dimension was further developed into prospective, retrospective and process oriented emotions. For example, hope and anxiety are prospective outcome emotions linked to possible future success

and failure, respectively, and pride and shame are retrospective outcome emotions linked to prior success and failure, respectively (Weiner, 1985; Zeidner 2007). Moreover, enjoyment, boredom, and anger are examples of activity emotions pertaining to the current achievement-related activities (Pekrun et al., 2006; 2010). In terms of valence, positive emotions can be distinguished from negative emotions, such as pleasant enjoyment versus unpleasant anxiety. In terms of activation, physiologically activating emotions can be differentiated from deactivating emotions, such as activating hope versus deactivating hopelessness (Pekrun et al., 2011). By using the dimensions valence and activation, the taxonomy is consistent with circumplex models of affect that arrange affective states in a two-dimensional (valence × activation) space (Barrett & Russell, 1998; Linnenbrink, 2007; Pekrun & Perry, 2014).

In line with contemporary component process models of emotions (Scherer, 2009), the control-value theory views emotions as sets of interrelated psychological processes, whereby affective, cognitive, physiological, and motivational components are of primary importance (e.g., feeling tense and uneasy, worrying, being activated peripherally, and wanting to escape in anxiety; Pekrun et al., 2011). Based on this multi-component definition of achievement emotions, items and scales of the achievement emotion questionnaire were constructed. The AEQ taps into nine different emotions occurring in three most common academic situations: attending classes, doing homework, and taking tests. Within each situation, the items are ordered in three blocks assessing emotional experiences before, during and after being in the addressed academic situation. The AEQ can be administered across different temporal situations and domains. By adapting the instructions accordingly, the original items measuring trait achievement emotions (e.g. habitual test anxiety) can be used to assess situation-specific emotions (e.g. anxiety experienced in a single course) or state emotions (e.g. anxiety experienced an hour before a specific exam). Similarly, they can be used to measure emotions experienced in different subjects such as math, language or arts (Pekrun et al., 2005).

2.2.2 Validation of the Achievement Emotion Questionnaire

So far, the AEQ has been validated across different cultures, ages, domains and situations (Frenzel et al., 2007a; Goetz et al., 2007; Peixoto et al., 2015; Pekrun et al., 2002; 2011; Lee, 2014; Lichtenfeld et al., 2012). For example, Lichtenfeld et al. (2012) examined the structural validity of an adapted version of AEQ measuring elementary students' enjoyment, anxiety and boredom in three academic settings. Multiple-model comparisons from the confirmatory factor analysis (CFA) corroborated the situational structures of the new measurement. Correlation analyses between control-value antecedents and emotions also confirmed the external validity of the instrument. Moreover, Peixoto et al. (2015) investigated the construct validity of a Portuguese version of the AEQ among 1515 pre-adolescents. Results provided support for both the reliability and the internal validity of the translated questionnaire. In another study, employing a cross-cultural design, Frenzel et al. (2007a) investigated the psychometric properties of the AEQ-Math between Chinese and German middle-school students. Multi-group CFA supported the structural validity and convergent validity of the AEQ-M across cultures. Latent mean analyses also revealed that there were significant differences in students' emotional experiences toward math learning between the two countries. In general, these studies provided adequate empirical support to the theoretical construct of the AEQ, however, all the studies tested only a limited number of emotions as compared with Pekrun et al.'s (2005; 2011) original scale. Furthermore, none of these studies investigated the proposed component structure of the AEQ as well as the relations between students' achievement emotions and L2 performance.

2.2.3 Effects of Emotions on Motivation and Performance

The control-value theory suggests that the effects of achievement emotions on learning and achievement depend on the interplay of several mediating mechanism, such as students'

motivation, strategy use, and regulation of learning (Pekrun 2006). Emotions are thought to influence students' intrinsic motivation to learn which is based on interest and curiosity in learning, as well as their extrinsic motivation related to the attainment of success or to the avoidance of failure (Pekrun et al., 2011). Specifically, positive activating emotions such as enjoyment, hope, and pride are thought to promote both intrinsic and extrinsic motivation and support self-regulation, thus positively affecting academic performance. Conversely, negative deactivating emotions, such as hopelessness and boredom, are posited to uniformly reduce motivation and the effort of self-regulated learning, implying negative effects on performance. For negative activating emotions, such as anger, anxiety, and shame, they are presumed to undermine intrinsic motivation and self-regulation, but can induce strong extrinsic motivation to invest effort to avoid failure. As a consequence, these emotions can have variable effects on students' learning (Lane et al., 2005; Turner & Schallert, 2001), although negative effects on overall academic performance likely outweigh any beneficial consequences for most students (Pekrun, Elliot, & Mayer, 2006; 2009; Peixoto et al., 2016).

2.2.4 Emotions in Second Language Learning

In the second language context, the influence of emotions on language learning has generally been neglected with the exception of anxiety (Garrett & Yong, 2009). The proliferation of research on language anxiety is perhaps due to that anxiety is more readily defined and measurable than other emotions as well as the development of the Foreign Language Classroom Anxiety Scale by Horwitz et al. (1986; 2010; Swain, 2013). In general, the majority of studies have confirmed that language anxiety had a negative influence on learners' L2 performance (Argaman & Abu–Rabia, 2002; MacIntyre & Gardner, 1994; Shao, Yu, & Ji, 2013) except for a few ones (Dewaele, 2002). For example, Shao et al. (2013) examined the roles of emotional competence and foreign language anxiety in English

classroom among 510 Chinese college students. Results showed that language anxiety negatively predicted self-rated and exam performance. The predictive effects of emotional competence on English performance were also mediated by foreign language anxiety. On the other hand, Dewaele (2002) found no correlations between students' anxiety and language performance in one study, but later confirmed the negative correlation between language anxiety and performance in another study (Dewaele, 2008).

Although several linguistic researchers have long pointed out the fundamental importance of emotions other than anxiety in relation to L2 motivation, self-regulation and performance (MacIntyre, 2002; Schumann, 1994; Scovel, 2000), empirical studies systematically addressing the impacts of diverse emotions, especially positive emotions such as enjoyment, pride and contentment, on language learning are slow to emerge (Bown & White, 2010). As Swain (2013) noted, one of the key reasons for this hindrance is the lack of a theoretically well-defined and empirically validated instrument. Recent research on achievement emotions has clearly demonstrated the unique contribution of different emotions to learning and achievement and the construct validity of the achievement emotion questionnaire (see above), however, this research has predominantly dealt with students' emotions related to math and more efforts are needed to expand it to other domains such as language learning. One notable exception is Lee (2014) who explored how different emotions related to language learning from a cross-cultural perspective. Using an adapted version of the AEQ, the findings showed that enjoyment, hope, and pride were positively related to L2 performance, whereas relations for anxiety, anger, shame, boredom, and hopelessness were negative across both German and Korean high school students. However, the study used a small sample size and the reliabilities of some scales and the achievement measure in this research were relatively low (Alpha < 0.7), and thus, the results merit further investigation.

The main goal of the present study was to develop a language version of the AEQ measuring students' emotions experienced in second language learning and test the psychometric quality of the new instrument through investigating its reliability, internal validity and external validity. This was accomplished by examining parameters of confirmatory factor analyses and internal correlations among eight different emotions (enjoyment, hope, pride, anger, boredom, anxiety, hopelessness and shame) as well as the relations between emotions, motivational variables (intrinsic motivation, extrinsic motivation, and self-regulation), and L2 performance. Importantly, to meet the call of the current replication debate in psychological science (Earp & Trafimow, 2015; Lakens, 2015), which concerned a serious crisis on the replicability of studies in psychology, all these analyses were replicated across two similar groups of students to further support the theoretical soundness and generalizability of the instrument.

2.3 Method

2.3.1 Participants and procedure

After excluding 138 participants due to unfilled identification information or missing for more than 20% of all items (Barry et al., 2013), the total final sample involved 1021 college students who were recruited from two cohorts of freshmen studying at a Foreign Language Studies University in Southeastern China. Participants of Cohort 2015 came from 16 classes and consisted of 471 students (76 males, 393 females, 2 unspecified) whose age ranged from 17 to 20 years (M = 18.72; SD = .70); while their counterparts of Cohort 2016 studied in 18 classes and consisted of 550 students (50 males and 500 females) who were between 17 to 21 years old (M = 19.66; SD = .76). All participants were enrolled in a required comprehensive English course and they were informed about the general purpose and the voluntary nature of participating in this research by their teachers. Participants completed the measures in three

different assessments. Demographics and motivational variables were assessed in the sixth week of the semester. Achievement emotions were measured in the 17th week of the semester, when students were preparing for their exam (6 days before the exam). In the 18th week, participants completed the final course exam. Students' exam performance data and prior English achievement as measured by their college entrance exam were obtained from the head teacher of the course at the end of the semester. For all assessments, participants were assured that their responses would remain confidential and would in no way influence their course grade. The questionnaire measures were presented in Chinese with the English version as a subsidiary reference to avoid potential cultural misunderstanding. The course teachers administered the assessments and were also available for answering any questions that the students may have during the assessment process.

2.3.2 Measures

Achievement emotions. The Achievement Emotion Questionnaire-Language (AEQ-L) was adapted from the learning-related emotion scales of the Achievement Emotion Questionnaire (Pekrun et al., 2011). By modifying the instruction of the original AEQ, the new measure provided a description of the language exam related situation the assessment refers to and then asked respondents to report how they felt prior to, during, and after studying for the language exam (see Appendix). The scales assessed eight different emotions: enjoyment (10 items; e.g., "I enjoy dealing with the course material"), hope (6 items; e.g., "I feel confident when studying"), pride (7 items; e.g., "I'm proud of myself"), boredom (8 items; e.g., "Studying for my courses bores me"), anger (8 items; e.g., "I get angry while studying"), anxiety (8 items; e.g., "I get tense and nervous while studying"), hopelessness (8 items; e.g., "I feel hopeless when I think about studying"), and shame (8 items; e.g., "I feel ashamed"). Participants responded on a 1 (*not at all*) to 5 (*very much*) scale, and the scores were summed to form the emotion indexes.

For the present adaptation of the AEQ and the motivation scales (see below) into Chinese, the English version of the learning-related AEQ scales (Pekrun et al., 2011) were used as the basis for translation by one educational psychologist and one bilingual English professor. The translations were then blindly back-translated by two bilingual master students in educational psychology. After this, both the Chinese and English versions of the questionnaire were presented to a translation guru and another bilingual English teacher, who further reviewed and polished the wording of the items to reach the closest possible equivalence across language versions. Finally, one pilot-test was also conducted among over 100 students to check the wording and internal consistency of the new instrument. These participants were excluded from the final sample.

Motivation variables. The Intrinsic Goal Orientation, Extrinsic Goal Orientation, and Self-regulated Learning scales from the MSLQ (Pintrich et al., 1991) were chosen as motivation indicators in the present study. The Intrinsic Goal Orientation scale measures students' intrinsic motivation based on interest and curiosity and the Extrinsic Goal Orientation scale measures students' extrinsic motivation related to getting good grades, with each scale comprised of four items (e.g., ''In classes at university, I prefer course material that arouses my curiosity, even if it is difficult to learn''; ''Getting good grades in classes at university is the most satisfying thing for me right now''). The Self-regulated Learning scale is a measure of students' overall regulation of effort to learn (four items; e.g., ''When studying, I set my own goals which I want to achieve''). Participants responded by using 1 (strongly disagree) to 5 (strongly agree) scales, and the scores were summed to form the intrinsic motivation (α = .64/.69 for Cohort 2016/Cohort 2015), extrinsic motivation (α = .71/.73), and self-regulated learning (α = .67/.70) indexes.

Exam performance. Participants' scores on their final course exam were used as a measure of language performance. The exam paper was developed based on the textbook of the course,

including quiz, close-test, multiple choice questions and composition. It focused on testing students' reading and writing skills in response to the course content. The exam was scored on a low-high range of 0 to100.

Prior achievement. Students' scores on their college entrance English exam were used as a measure of their prior achievement. The exam tests students' reading comprehension ability, use of English vocabulary and grammar, and writing ability. Sample questions include multiple choice questions, close-test, paragraph correction and composition. The exam scores range from 0 to 120.

2.3.3 Data Analysis

Structural equation modelling (SEM) was conducted using M*plus* 8.0 (Muthén, & Muthén, 1998-2017) to test the hypothesised internal structure of the AEQ-L. SEM permits the use of latent constructs and allows for estimating the relationships among latent constructs while providing explicit estimates of measurement errors to increase the accuracy of analysis (Byrne, 2001). Moreover, it offers a multiple group approach that enables simultaneous model fitting for two samples or more at a time, which renders it an ideal technique for this study. The analyses in the present research were conducted using robust maximum likelihood estimator (MLR). As participants in the two studies came from multiple classes, which represented a nested data structure, this was taking into account by using the "type = complex" command in M*plus* to control for biased parameter estimates. MLR estimates with standard errors and a chi-square test statistic that are robust to non-normality and non-independence of observations when used with "type = complex" (Muthén, & Muthén, 1998-2017).

Following Hu and Bentler's (1999) recommendation, we used both absolute and incremental fit indexes to evaluate the model fit, including the comparative fit index (CFI), the Tucker–Lewis index (TLI), the root mean square error of approximation (RMSEA), and the

standardized root mean square residual (SRMR). CFIs ≥ .95, TLIs ≥ .95, RMSEAs ≤ .06, and SRMRs ≤ .08 are thought to indicate good fit, .95 ≥ CFIs ≥ .90, .95 ≥ TLIs ≥ .90, RMSEAs between .06 and .08 reasonable fit, and RMSEAs between .08 and .10, SRMRs between .08 and .10 mediocre fit. As the chi-square value $\chi 2$ is sensitive to sample size leading to biased rejection of the model, it wasn't used as an indicator in the analyses considering the large sample in the present investigation (Byrne, 2011).

2.4 Results

2.4.1 Item and scale statistics

Table 1 presents response distributions, item-total correlations and reliabilities of the AEQ-L scales across the two samples. The indices of range, mean and standard deviation indicate that there were sufficient variations of scores on all emotions. Moreover, the findings show that scale items had excellent part-whole corrected item-total correlations for all scales, with none of the correlations dropping below the .30 threshold. Furthermore, the current reliability coefficients were above .80 for all scales and above .85 for 5 of the 8 scales, indicating good to excellent reliabilities for the Chinese version of the AEQ-Language. Finally, most of the reported parameters were similar for each emotion between the two samples, which provides further support for the generalizability of the scale characteristics.

Table 1
Item and Scale Statistics.

		Cohort 2016 (N = 550)					Cohort 2015 (N = 471)				
Emotion	Items	Range	M	SD	Mean r_i(t-i)[a]	Alpha	Range	M	SD	Mean r_i(t-i)[a]	Alpha
Enjoyment	10	15-50	31.08	6.20	.61	.88	19-50	32.91	5.92	.57	.86
Hope	6	9-30	18.41	4.04	.66	.86	7-30	18.92	3.95	.63	.85
Pride	7	12-35	22.84	4.65	.63	.83	10-35	23.25	4.85	.62	.86
Boredom	8	8-39	19.86	5.21	.59	.85	8-36	17.69	5.08	.61	.86
Anger	8	8-39	18.85	5.21	.58	.85	8-35	17.92	5.07	.58	.87
Anxiety	8	8-40	21.31	4.61	.52	.81	8-36	21.07	4.94	.53	.81
Hopelessness	8	8-35	16.31	4.70	.63	.87	8-34	17.15	5.28	.65	.88
Shame	8	8-37	19.81	4.91	.56	.84	8-38	20.60	5.21	.53	.81

[a] Median of part-whole corrected item-total correlations

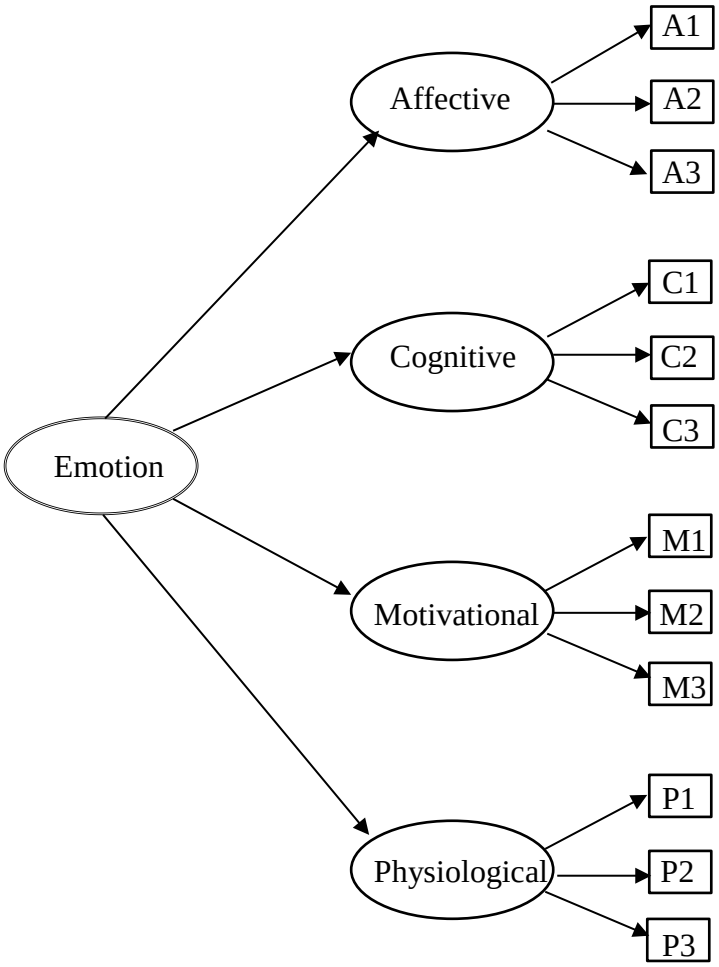


Figure 1. Hierarchical model for component structures of achievement emotions.

2.4.2 Internal validity: component structure of emotions

To test the presumed internal structure of the AEQ, a hierarchical model was constructed with affective, cognitive, motivational and physiological items being specified to load on four separate first-order latent factors and each first-order latent component factor being specified to load on a second-order emotion factor (Figure 1). Structural equation modeling (Muthén, & Muthén, 1998-2017) was used first to test the fit of this model for each of the eight scales separately between the two samples (Table 2).

As can be seen from Table 2, the model fit of the hierarchical model was at least reasonable for all of the scales and good for the majority of the scales. This indicates that the proposed component structure of the AEQ is tenable across groups in the present Chinese context. Moreover, it corroborates Pekrun et al.'s (2011) assertion that the internal component structure should be taken into account for all achievement emotions, not only for test anxiety.

Table 2
Emotion Component Structures of AEQ-L Scales: Fit Statistics for Each Group Separately.

	Cohort 2016 (N = 550)					Cohort 2015 (N = 471)				
Emotion	*df*	CFI	TLI	RMSEA	SRMR	*df*	CFI	TLI	RMSEA	SRMR
Enjoyment	32	.98	.98	.035	.038	32	.98	.96	.049	.034
Hope	6	.97	.95	.066	.018	6	.99	.97	.056	.034
Pride	12	.97	.95	.063	.028	12	.98	.98	.050	.035
Boredom	18	.98	.97	.044	.023	18	.99	.99	.024	.032
Anger	18	.99	.98	.045	.021	18	.99	.99	.029	.024
Anxiety	18	.97	.96	.044	.026	18	.99	.98	.031	.029
Hopelessness	18	.98	.96	.058	.024	18	.99	.98	.042	.032
Shame	18	.97	.96	.050	.032	18	.97	.95	.049	.031

Based on these group-specific baseline models, a series of multi-group confirmatory factor analyses (CFA) were conducted to test the invariance of several models in an increasingly stringent manner, including factor loadings, item intercepts, factor variances/covariances and

latent means (Byrne, 2011; Dimitrov 2010). Given that the chi-square difference ($\Delta\chi 2$) is sensitive to sample size, we reported ΔCFI along with ΔRMSEA and ΔSRMR for evaluating differences of fit between models. We adopted Chen's (2007) cut-off criteria, with a loss of fit of $\Delta CFI \geq .01$, $\Delta RMSEA \geq .015$, and $\Delta SRMR \geq .03$ (for loading invariance) or $\geq .01$ (for intercepts and residual invariance) being regarded as substantial.

As shown in Table 3, the configural model (Model 0), only to which the same pattern of fixed and freely estimated parameters holds across groups, had good fit for all eight emotions, indicating invariance of baseline model form. This implies that the latent variables were comparable in a qualitative sense across samples. Next we tested model invariance by constraining item loadings to be equal across groups (Model 1). Comparison of model 1 with model 0 resulted in no significant decrease of it for any emotions. Additionally constraining item intercepts yielded a loss of fit for all eight emotions (Model 2 vs. Model 1). To locate the source of non-invariance for each emotion, we examined modification indices (MI) with a respecified critical value of 10 (Byrne, 2011). Following the recommendation to release one parameter at a time (Dimitrov, 2010), model 2 was rejected in favor of model 2P, a partial-invariance model in which particular item intercepts for each emotion were free to vary across groups. There was no substantial decrease of fit comparing model 2P with model 1. Based on these partial invariance models, we continued to test invariance by imposing equality constraints on factor variances and covariances (Model 3). The difference of fit between Model 2P and Model 3 was non-significant for all eight emotions. Finally, we examined invariance at the level of latent mean for each emotion or more commonly expressed as latent mean differences (Model 4). This was done by fixing the latent factor means for one group to zero; this group then operated as a referent group against which latent means for the other group were compared (Byrne, 2011). As revealed by the fit indices in Table 3, model 4 exhibited even slightly better fit, albeit non-significant, than Model 2P for all eight emotions. This indicates

that the latent means between these two cohorts of students were not entirely equal but still very similar. In sum, these tests provide reasonable support for the measurement invariance and structural invariance of the AEQ-Language Chinese across two student groups.

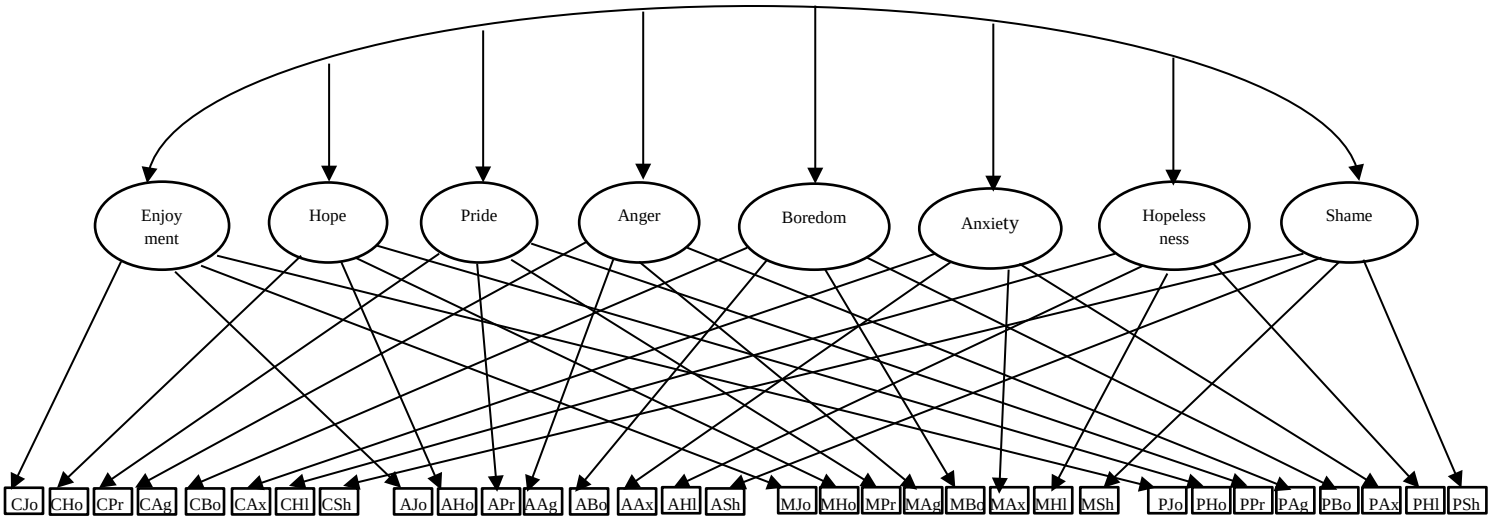
Table 3
Test of Model Invariance Across Two Samples: Model Fit Indexes.

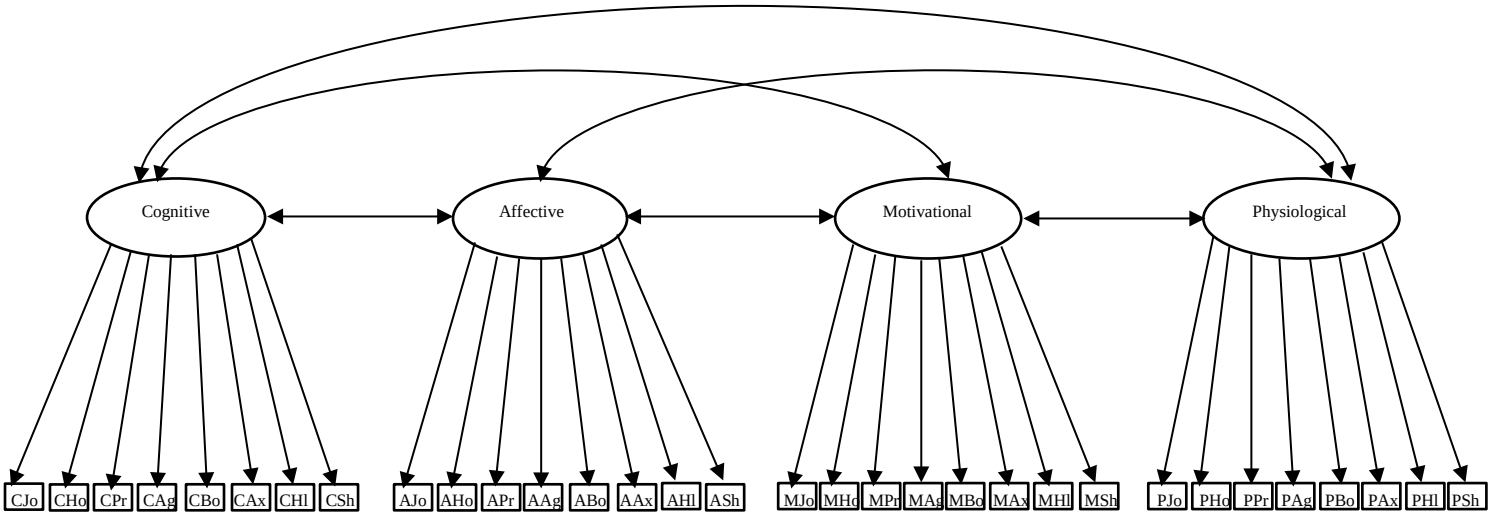
Emotion	Model Index	Model 0	Model 1	Model 2	Model 2P	Model 3	Model 4
Enjoyment	*df*/SRMR	64/.035	72/.047	80/.078	78/.055	79/.058	75/.052
	CFI/RMSEA	.98/.039	.98/.042	.93/.067	.97/.043	.97/.043	.97/.042
Hope	*df*/SRMR	12/.029	19/.042	25/.053	24/.048	25/.050	22/.045
	CFI/RMSEA	.98/.066	.98/.063	.96/.070	.97/.065	.97/.064	.97/.061
Pride	*df*/SRMR	24/.033	30/.042	37/.048	36/.045	37/.049	34/.048
	CFI/RMSEA	.98/.059	.98/.057	.96/.059	.97/.055	.97/.054	.97/.056
Boredom	*df*/SRMR	36/.028	43/.039	51/.083	49/.047	50/.047	48/.041
	CFI/RMSEA	.98/.037	.98/.037	.95/.060	.97/.044	.97/.043	.98/.037
Anger	*df*/SRMR	36/.043	43/.040	51/.056	50/.042	51/.044	47/.036
	CFI/RMSEA	.99/.020	.99/.020	.95/.057	.98/.033	.98/.033	.99/.024
Anxiety	*df*/SRMR	36/.028	43/.033	51/.050	50/.039	51/.046	48/.043
	CFI/RMSEA	.98/.039	.98/.034	.94/.059	.97/.040	.97/.040	.98/.038
Hopelessness	*df*/SRMR	36/.028	43/.041	51/.058	49/.044	50/.053	46/.052
	CFI/RMSEA	.98/.051	.98/.049	.96/.064	.97/.050	.97/.053	.97/.053
Shame	*df*/SRMR	36/.032	43/.042	51/.055	50/.046	51/.046	49/.046
	CFI/RMSEA	.97/.051	.97/.049	.95/.058	.96/.051	.96/.050	.96/.052

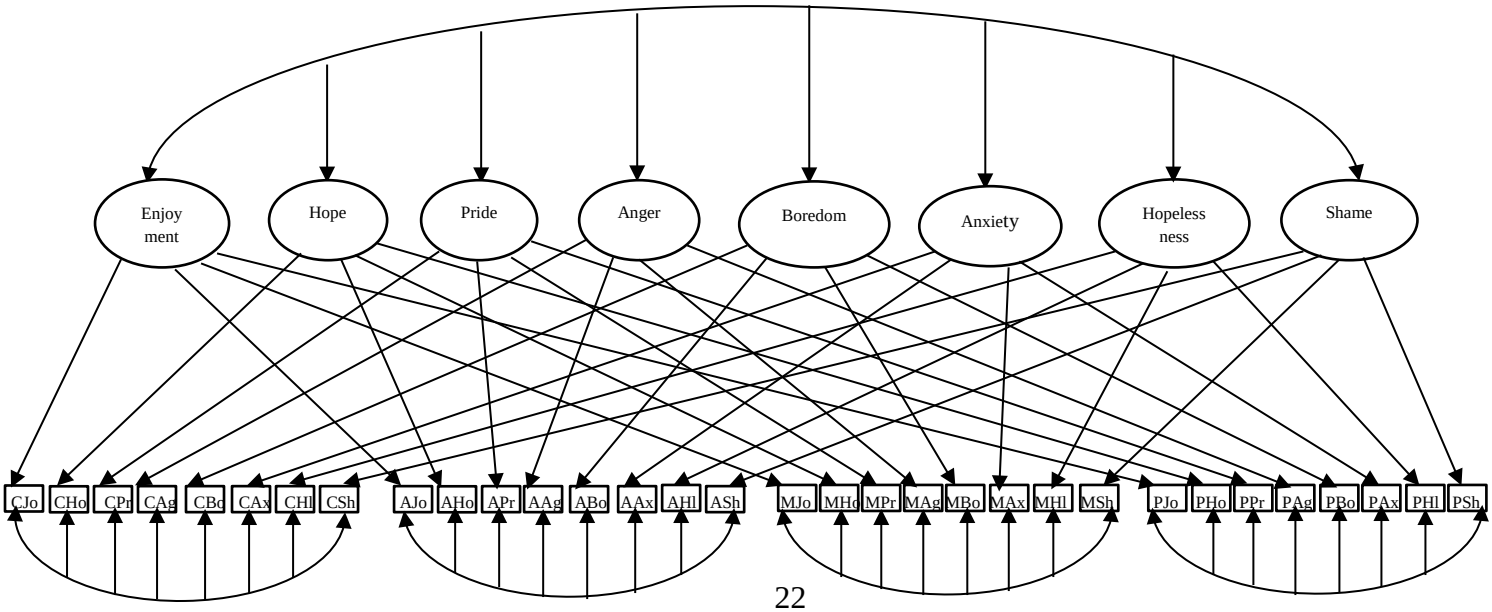
Note: Model 0 = configural model (no invariance imposed); Model 1 = invariant factor loadings; Model 2 = invariant factor loadings and invariant intercepts; Model 2P = invariant factor loadings and partially invariant intercepts; Model 3 = invariant factor loadings, partially invariant intercepts, and invariant factor variances and covariances; Model 4 = invariant factor loadings, partially invariant intercepts, invariant factor variances and covariances, and latent mean differences.

Finally, in order to more fully assess the component structure across all achievement emotions, we constructed three models and tested them competitively, aiming to document the distinctness of the emotion constructs assessed by the AEQ-L. As the learning-related hope scale doesn't include physiological items and the pride and shame scales contain only one affective item respectively, these three component scales were not modelled. The 29 emotion

component scales of the instrument served as manifest indicators in each model (Figure. 2). Model A consisted of eight latent factors made up of the eight discrete emotions assessed by the AEQ-L. Indicators for the factors were the emotion component scales pertaining to the respective emotion. Model B was a four-component model comprised of four latent factors representing the four components of emotions addressed by the AEQ-L. The cognitive, affective, motivational, and physiological items of emotions served as indicators for the respective latent factors. Model C sought to fully represent the two-facet structure of the AEQ-L by simultaneously taking the eight discrete emotions and the four components into account. Following recommendations by Marsh et al. (1993), a correlated uniqueness approach was used to construct this model. The eight discrete emotions were represented by eight latent factors, and the influences of the four components were taken into account by letting the uniqueness of scales correlate within components. To test model fit, we used the same set of indicators as described earlier. The eight-emotion model had a poor fit to the data, with CFI = .86/.88, TLI = .85/.87, RMSEA = .045/.044, and SRMR = .061/.054 for Cohort 2015/2016. Moreover, the fit for the four-component factor model was even worse, with CFI = .72/.75, TLI = .70/.73, RMSEA = .063/.063, and SRMR = .100/.094. In contrast, the two-facet, emotion × component model showed a reasonable fit for both samples, with CFI = .94/.95, TLI = .91/.93, and RMSEA = .035/.034, and SRMR = .049/.044. In line with the control-value theory's assumption, these findings demonstrate that the relationships between different emotions of the AEQ-L can be best explained by taking into account both the differences between discrete emotions and the differences between different components that comprise emotions.


Enjoy ment
Hope
Pride
Anger
Boredom
Anxiety
Hopeless ness
Shame
CJo CHo CPr CAg CBo CAx CHl CSh
AJo AHo APr AAg ABo AAx AHl ASh
MJo MHo MPr MAg MBo MAx MHl MSh
PJo PHo PPr PAg PBo PAx PHl PSh


Cognitive
Affective
Motivational
Physiological
CJo CHo CPr CAg CBo CAx CHl CSh
AJo AHo APr AAg ABo AAx AHl ASh
MJo MHo MPr MAg MBo MAx MHl MSh
PJo PHo PPr PAg PBo PAx PHl PSh


Enjoy ment
Hope
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Shame
CJo CHo CPr CAg CBo CAx CHl CSh
AJo AHo APr AAg ABo AAx AHl ASh
MJo MHo MPr MAg MBo MAx MHl MSh
PJo PHo PPr PAg PBo PAx PHl PSh

Figure 2. SEM models for relationships between emotions. Upper: Model A (eight emotion-factor model). Middle: Model B (four component-factor model). Lower: Model C (emotion × component-factor model). C, A, M, and P denote cognitive, affective, motivational, and physiological components of emotions, respectively. Jo = enjoyment, Ho = hope, Pr = pride, Re = relief, An = anger, Ax = anxiety, Hl = hopelessness, Bo = boredom.

2.4.3 Internal validity: relationships between emotions

The theory of achievement emotions postulates that it is useful to distinguish different discrete emotions in academic settings. The above two-facet model was used to estimate the latent relationships between the eight emotions in language learning. As may be seen from Table 4, the positive emotions enjoyment, hope, and pride were positively correlated across the two samples. Similarly, there were positive correlations between the negative emotions boredom, anger, anxiety, hopelessness, and shame. The correlations between positive emotions, on the one hand, and negative emotions, on the other hand, were moderately negative. Overall, these findings show that the emotion constructs measured by the AEQ-L are clearly separable. This is particularly supported by emotions that might be presumed to constitute opposite ends of a bipolar continuum, such as enjoyment and boredom, or hope and hopelessness, which demonstrated no more than moderately negative correlations. The strongest relationships were found for neighboring, like-valenced emotions such as enjoyment and pride. In interpreting these correlations, it is important to note that although some of the relationships between neighboring emotions were high, they clearly indicate that all of the emotion constructs are separable, given that the latent coefficients were corrected for unreliability and represent the highest possible estimates for these relationships. These findings are not only in accordance with those found by using the original scale (Pekrun et al., 2005; 2011), but also replicated across two different groups of students.

Table 4
Latent Correlations Between Emotions of the AEQ-L Scales.

	1	2	3	4	5	6	7	8
1 Enjoyment	—	.81**	.84**	-.50**	-.49**	-.48**	-.44**	-.41**
2 Hope	.82**	—	.78**	-.52**	-.42**	-.46**	-.54**	-.46**
3 Pride	.86**	.77**	—	-.48**	-.42**	-.40**	-.37**	-.34**
4 Boredom	-.46**	-.52**	-.44**	—	.71**	.71**	.78**	.62**
5 Anger	-.48**	-.53**	-.45**	.81**	—	.68**	.67**	.60**
6 Anxiety	-.28**	-.48**	-.47**	.62**	.60**	—	.69**	.73**
7 Hopelessness	-.47**	-.52**	-.35**	.74**	.59**	.59**	—	.68**
8 Shame	-.31**	-.46**	-.36**	.63**	.69**	.72**	.68**	—

Note: Coefficients above the diagonal are for Cohort 2015 and Coefficients below the diagonal are for Cohort 2016.
$p < .01$ for all coefficients.

2.4.4 External validity: linkages with students' motivation and L2 performance

To examine the external validity of the AEQ-L, three motivational variables and students' language grades were used as indicators to correlate with emotion scale scores. Meanwhile, students' previous English achievement and gender were controlled when estimating the relationships between emotions, motivation and performance since past research has reported that these variables had significant effects on students' emotions and achievement (Frenzel et al., 2007a; Marsh & O'Mara, 2008). As predicted by Pekrun's (2006; Pekrun & Perry, 2014) control-value theory described earlier, there were clear linkages between emotions, motivation and L2 performance (Table 5), with different patterns of relations for different group of emotions. Specifically, the positive activating emotions enjoyment, hope and pride related positively to intrinsic motivation, extrinsic motivation, self-regulated learning, and exam scores for both cohorts of students. In contrast, the negative deactivating emotions hopelessness and boredom showed the opposite pattern of linkages considering their uniformly negative correlations with intrinsic motivation, extrinsic motivation, self-regulated learning, and academic performance, except for the relation between boredom and extrinsic motivation in Cohort 2015, which exhibited a negative trend. Overall, the pattern of relationships

corroborates that positive activating emotions are likely beneficial for students' engagement and learning, whereas negative deactivating emotions are likely detrimental, as posited by the cognitive-motivational model of emotion effects (Pekrun, 2006).

Interestingly, relationships were more complex for the negative activating emotions anger, anxiety, and shame. While the three emotions correlated negatively with intrinsic motivation, all of them showed no significant correlations with students' extrinsic motivation targeting achievement outcomes in the present sample. These findings are in line with the control-value theory's proposition that negative activating emotions can exert variable effects on students' learning. Despite these variable effects, however, anger, anxiety, and shame related negatively to students' self-regulated learning and to their language performance.

Table 5
Correlations of Achievement Emotions with Motivation and L2 Performance.

	2016 Cohort (N =550)				2015 Cohort (N = 471)			
	Intrinsic	Extrinsic	Regulation	Exam	Intrinsic	Extrinsic	Regulation	Exam
Enjoyment	.37**	.15**	.40**	.39**	.44**	.27**	.42**	.43**
Hope	.27**	.14**	.41**	.34**	.35**	.19**	.42**	.48**
Pride	.24**	.17**	.39**	.34**	.38**	.26**	.35**	.45**
Boredom	-.20**	-.12**	-.34**	-.26**	-.23**	-.09	-.28**	-.32**
Anger	-.18**	-.04	-.25**	-.12**	-.21**	-.08	-.24**	-.28**
Anxiety	-.17**	.02	-.29**	-.17**	-.16**	-.01	-.24**	-.33**
Hopelessness	-.19**	-.14**	-.31**	-.32**	-.20**	-.11*	-.27**	-.35**
Shame	-.17**	.00	-.30**	-.19**	-.11*	.01	-.24**	-.31**

Note. *p < .05. **p < .01.

2.5 Discussion

The present study aimed at constructing an instrument measuring students' diverse emotions in second language learning. We sought to validate this measure through examining its reliability, internal validity, and external validity. Finally, we replicated all the findings across

two very similar groups of students. Specifically, consistent with previous validation work (Frenzel et al., 2007a; Lichtenfeld et al., 2012), the findings indicate that the item statistics and reliabilities of the AEQ-L scales were good to excellent for all emotions in each of the two cohorts. Moreover, model parameters obtained from single- and multi-group CFAs demonstrated a high degree of fit for the hierarchical component structure of the AEQ-L. This is in accord with the assumption of Pekrun's (2006; Pekrun & Perry, 2014) control-value theory and corroborates that the adapted scales are well-suited to describe the internal structures of achievement emotions in terms of their affective, cognitive, motivational, and physiological components. It also suggests that any future instruments designed to measure students' emotions may well consider the component structures of these emotions. Furthermore, in line with existing literature (Peixoto et al., 2016; Pekrun et al., 2009), the results of correlation analyses confirmed that students' emotional experiences, and the AEQ-L scales assessing these experiences, are distinguishable among various discrete emotions. This highlights the feasibility and importance for second language researchers to move beyond language anxiety to include a broader range of emotions experienced in language learning.

Further, the findings showed that students' achievement emotions were linked to their motivation and L2 performance. The positive relations between positive activating emotions (enjoyment, hope, and pride) and L2 motivation and performance and the negative relationships for negative deactivating emotions (hopelessness and boredom) are all in line with previous research (Pekrun et al., 2002). As for the zero correlations between negative activating emotions (anger, anxiety, and shame) and extrinsic motivation, this may be explained by that although these emotions can externally motivate students to invest effort in a short term, they may undermine students' total effort in a long run, and thus led to an offsetting effect in the present investigation (Pekrun et al., 2011). As also suggested by the results, they were negatively correlated with students' self-regulated learning, and with their language

performance. Overall, these findings support L2 scholars' assertion on the underlying role of diverse emotions for students' motivation and learning (MacIntyre, 2002; Scovel 2000).

Lastly, most of the findings in the present study not only replicate those found in the original scales (Pekrun et al., 2005; 2011) as well as recent validations (Lee, 2014; Peixoto et al., 2015), but also reproduce themselves across two similar groups of students. This provides accumulating evidence that the AEQ together with its various forms of adaptations are reliable and valid in terms of measuring students' discrete emotions in different academic domains and settings, and the constructions of these instruments are based on solid theory. The significant effects yielded from these studies are not due to chance or random error, but bear substantive meaning for the advancement of psychology and education.

Although these findings substantiate the psychometric quality of the AEQ-L, there are some limitations in the present research. First, the AEQ-L used in the present study was adapted from a version of the learning-related AEQ. Future research is advised to use the full instrument to probe students' emotions in language learning across different academic settings as well as their emotions in other domain such as engineering or sports. If equipped with sound theories, innovative L2 researchers may also develop new scales tailoring to the domain-specific features and different skills (listening, speaking, reading, and writing) of language learning.

Second, although we employed a longitudinal design, data obtained from the present study is correlational by nature, thus precluding any causal conclusion. Future research may use cross-lagged or experimental design to disentangle the causal relationships between emotions, motivation, and L2 performance. It might also be interesting to address the reciprocal links among these variables (Pekrun et al., 2014; 2017). However, as we have controlled for previous achievement which may cause autoregressive effects, this implies that the analyses are more than just correlational.

Furthermore, as self-reported questionnaires are susceptible to response bias, the

correlational linkages found in the present study may be inflated by common method variance caused by these biases (Donaldson et al., 2000). Future research should also include objective measures such as implicit measures of emotions, EEG or fMRI to examine the role emotions play in language acquisition.

Finally, the present findings bear practical implications for language education. First, our findings suggest that the AEQ-L can be used to assess students' diverse emotions in second language learning. Applied linguists can now employ this scale to test how various emotions other than anxiety influence individual variables of language learning such as motivation, learning strategies, learning styles, and willingness to communicate (Dörnyei, 2003; MacIntyre, 2007; Oxford, 1993) across cultures (individual vs. collective) and languages (Spanish, Arabic, Japanese etc). Informed by these findings, material developers and curriculum designers may incorporate an optimal combination of cognitive and emotional elements into their syllabuses in order to improve students' L2 learning efficiency. Second, in line with our assumption, the present study shows that a number of different emotions are of critical importance to students' engagement and language learning. By implication, L2 teachers are advised to heed a broad variety of students' emotions including but also beyond the well-researched emotion anxiety. For example, teachers can use innovative instruction techniques to stimulate students' interests and expectations for the class so as to foster a positive emotional experience for their language learning (Rouhani, 2008; Shao, Yu, & Ji, 2012).

In conclusion, the present research made an initial attempt to adapt a scale attending to different emotions in second language learning. We believe that studying diverse emotions is an important step forward for L2 researchers, scientists, and educators alike. We hope that the instrument developed and validated in the present study serves as a catalyst for future endeavors in this nascent area of research.

Chapter 3. The Influence of Control and Value Appraisals on Achievement Emotions and Second Language Performance

The focus of this study is on the relations among appraisal antecedents, achievement emotions, and second language (L2) outcomes. Based on Pekrun's (2006) control-value theory of achievement emotions, independent and interactive effects of control and value on achievement emotions and L2 performance as well as the conditional indirect effects of appraisals on achievement through emotions were examined. Five hundred and fifty Chinese college students completed appraisal measures, emotion questionnaires and the course exam in a longitudinal manner across one semester. Results showed that control and value appraisals correlated positively with positive emotions and L2 performance and negatively with negative emotions, except anxiety. Control and value interacted to predict all eight emotions and L2 performance in expected directions. More importantly, the multiplicative impact of appraisals on L2 performance was mediated by four of the focal emotions. Findings provided support for the generalizability of control-value theory in the second language context and elucidated the role of appraisals and emotions on L2 achievement. Directions for future research and implications for language education are also discussed.

Keywords: control, value, appraisal, emotion, achievement, language

3.1 Introduction

Achievement emotions play a vital role in learning in general and second language (L2) learning in particular. Positive emotions such as enjoyment, hope, and pride can put learners in an optimal state for language learning and greatly facilitate the learning process. In contrast, negative emotions such as anxiety, anger, and boredom can compromise learning (Arnold & Brown, 1999; Schumann, 1994; Swain 2013). Despite the fundamental importance of different emotions for language learning, past research addressing the relation between emotions and second language learning tended to focus exclusively on language anxiety (Horwitz, Horwitz, & Cope, 1986; MacIntyre, 2002), neglecting a full range of other emotions. Recent research in educational psychology has clearly confirmed the influence of discrete emotions on motivation to learn, use of learning strategies, and performance (Goetz et al., 2014; Hall et al., 2006; Pekrun et al., 2011; 2014, 2017). However, research on second language learning has yet to systematically investigate learners' emotions.

Given the relevance of achievement emotions for students' learning, it is important to acquire knowledge about their antecedents. Studies on the antecedents of achievement emotions represent an important research avenue that deserves more attention from second language researchers (Goetz et al., 2010; Hsieh & Schallert, 2008). Based on Pekrun's (2006; Pekrun & Perry, 2014) control-value theory of achievement emotions, the present study focuses on two types of cognitive appraisals as antecedents, namely, perceived control and perceived value. We examined both independent and interactive effects of control and value appraisals on eight different emotions (enjoyment, hope, pride, anxiety, anger, boredom, shame and hopelessness) as well as resulting achievement outcomes. Because the relationship between cognitive appraisals and achievement could be mediated by achievement emotions, the interactive effects of control-value appraisals on achievement mediated by emotion were also probed. By uncovering the dynamic mechanism linking the antecedents and outcomes of

achievement emotions, instructional ideas can be generated on how to design effective training programs for language learners so as to foster beneficial affective experiences and promote the development of their language competencies.

3.2.1 Concept of Achievement Emotions

Achievement emotions are defined as emotions directly tied to achievement activities or achievement outcomes (Pekrun, 2006). The systematic study of diverse emotions related to achievement and motivation can be traced back to Weiner's (1985) attributional research and Pekrun's program of exploratory research into students' emotions (Pekrun et al., 2002). In a series of qualitative and quantitative studies, Pekrun and colleagues identified nine emotions (enjoyment, hope, pride, relief, anger, anxiety, shame, hopelessness, and boredom) which were most commonly endorsed by students in academic settings, yet largely neglected by emotion researchers except for anxiety (Pekrun et al., 2000, 2002). These emotions were classified into a three-dimensional taxonomy considering the dimensions of valence, activation, and object focus. In terms of valence, positive emotions can be distinguished from negative emotions, such as pleasant enjoyment versus unpleasant anxiety. In terms of activation, physiologically activating emotions can be differentiated from deactivating emotions, such as activating hope versus deactivating hopelessness. In terms of object focus, activity emotions can be discriminated from outcome emotions, such as process-related boredom and result-related shame. The object focus dimension has been developed further into prospective, process and retrospective oriented emotions (see Pekrun & Perry, 2014, for examples). As emotions generally, achievement emotions can also be conceptualized in a trait-like (e.g. habitual test anxiety) or state-like manner (e.g. anxiety experienced an hour before a specific exam).

3.2.2 Effects on Learning and Achievement

Pekrun's (1992; 2006) cognitive-motivational model of emotion effects assumes that the effects of emotions on learning and achievement depend on the interplay between various cognitive and motivational mechanisms. Empirical data from cross-sectional and longitudinal studies have shown that positive achievement emotions (enjoyment, hope, pride) positively affect learning and performance by strengthening interest, motivation, effort, self-regulation of learning, use of flexible and deep learning strategies, and the availability of cognitive resources for task purposes (Artino et al., 2010; Goetz et al., 2012; Pekrun et al., 2014, 2017). Conversely, negative achievement emotions (anxiety, anger, shame, boredom and hopelessness) typically diminish interest and motivation, undermine self-regulation, prompt the use of more rigid and superficial learning strategies, and cause irrelevant thinking, which reduces the cognitive resources available for task performance (Boekaerts, 1994; Daniels et al., 2009; Pekrun et al., 2014, 2017). Consequently, these negative emotions typically have a negative impact on students' academic achievement. Although a few studies have shown that negative activating emotions (anxiety, anger, and shame) may promote learning in some students due to inducing extrinsic motivation to invest effort to avoid failure (Lane et al., 2005; Turner & Schallert, 2001), negative emotions are detrimental to overall academic performance in the vast majority of students (Hembree, 1988; Pekrun et al., 2006; 2009; Peixoto et al., 2016).

Notwithstanding these findings, the influence of achievement emotions on second language learning has rarely been examined with the exception of language anxiety. In general, the majority of these studies have confirmed that language anxiety had a negative influence on learners' L2 performance (Argaman & Abu–Rabia, 2002; MacIntyre & Gardner, 1994; Shao, Yu, & Ji, 2013) except for a few ones (Dewaele, 2002). For example, Shao et al. (2013) examined the roles of emotional competence and foreign language anxiety in English classroom among 510 Chinese college students. Results showed that language anxiety negatively predicted self-rated and exam performance. The predictive effects of emotional

competence on English performance were also mediated by foreign language anxiety. On the other hand, Dewaele (2002) found no correlations between students' anxiety and language performance in one study, but later confirmed the negative influence of language anxiety on performance in another study (Dewaele, 2008). Although several linguistic researchers have long pointed out the fundamental importance of emotions other than anxiety in relation to L2 motivation, self-regulation and performance (MacIntyre, 2002; Schumann 1994; Scovel 2000), empirical studies systematically addressed the impacts of diverse emotions, especially positive emotions such as enjoyment, pride and contentment, on language learning are slow to emerge (Bown & White, 2010).

Achievement emotions are known to be organized in domain-specific ways (Goetz et al., 2007), but past research has predominantly dealt with domain-general emotion variables (such as general test anxiety) or with students' emotions related to math (e.g., Ahmed et al., 2010; Luo et al., 2014; Peixoto et al. 2016; Pekrun et al., 2017). One notable exception is Goetz et al.'s (2006) study, which investigated students' emotional experiences across six different subjects: Latin, English, German, Math, Music and Sports. Results showed that students from grades 7 to 9 reported significantly different intensities of enjoyment, anxiety, and boredom across these subjects, supporting the domain-specific nature of students' achievement emotions. However, the relations between these emotions and student's achievement were not examined.

Generally, second language researchers did not pay much attention to the impact of discrete emotions on language performance. An exception is Lee (2014) who explored language emotions from a cross-cultural perspective. The findings showed that enjoyment, hope, and pride were positively related to L2 performance, whereas relations for anxiety, anger, shame, boredom, and hopelessness were negative, among both German and Korean high school students. However, the study used a small sample size and the reliability of some emotion scales and the achievement measure in this research was relatively low (Alpha < 0.7), and thus,

the results merit further investigation.

3.2.3 Control and Value Appraisals as Antecedents of Achievement Emotions

It has long been recognized that it is not events themselves but rather their subjective perception that prompts emotions (Lazarus, 1991; Stumpf, 1899). For achievement emotions, Pekrun's (2006; Pekrun & Perry, 2014) control-value theory (CVT) proposes that individuals experience specific achievement emotions when they feel in control of, or out of control of, achievement activities and outcomes that are subjectively important, implying that control and value appraisals are the proximal determinants of these emotions (Pekrun et al., 2007). Higher levels of perceived control and high positive perceived value of achievement activities and outcomes are assumed to elicit positive emotional experiences such as hope, enjoyment or pride, whereas lower levels of control are expected to elicit negative emotions such as anxiety or hopelessness. As such, control has differential effects on positive versus negative emotions. In contrast, value is thought to amplify both types of emotions. Boredom is an exception from this pattern of presumed effects. According to the CVT, boredom can be due both to low levels of control (overchallenge) or to high levels of control (underchallenge) and is generally triggered by lack of value. So far, a number of studies have corroborated that positive achievement emotions are positively associated with students' control and positive value appraisals, while the opposite pattern has generally been found for negative achievement emotions (Artino & Jones, 2012; Burić & Sorić, 2012; Daniels & Stupnisky, 2012; Dettmers et al., 2011; Pekrun et al., 2011).

Appraisal theorists have long asserted that specific emotional experiences depend on combinations of discrete appraisals (Arnold, 1960; Roseman 2001). For instance, the expectancy-value theories suggest that expectancy and value combine in multiplicative ways to stimulate a prospective emotion (Atkinson, 1964). In the same vein, the control-value theory

proposes that appraisals of both control and value are necessary for an achievement emotion to be instigated. More precisely, both the type of emotion experienced and its intensity are assumed to be interactively influenced by control and value (Pekrun, 2006). Pleasant achievement emotions are posited to be a multiplicative function of the perceived controllability and the value of academic activities or outcomes. If a student values some learning material and believes she will be able to master it, she will enjoy learning the material. In contrast, if she is not interested in the material or perceives a lack of control over how to learn it, the learning activity will not be enjoyable. Similarly, unpleasant achievement emotions (except for boredom) are assumed to be a joint function of perceived lack of control and high value. For example, if a student perceives failure at an upcoming exam to be possible and not sufficiently controllable, and judges the exam to be important because of its consequences for attaining career goals, he will be afraid of the exam. In contrast, if there is no anticipation of failure, or the exam is irrelevant to the student's goals, no anxiety will be experienced (Pekrun et al., 2007). For most emotions, emotional intensity increases with increasing control (in positive emotions) or lack of control (in negative emotions), and with increasing subjective value. If one of the two is lacking, the emotion will not be induced (Pekrun et al., 2014). In other words, these assumptions imply that perceived value moderates the effects of perceived control on achievement emotions: The higher the subjective value for achievement activities or outcomes, the stronger the influence of control on both positive and negative emotions.

However, empirical evidence on the assumed multiplicative impact of control and value appraisals on emotions is largely lacking, except for two studies by Goetz et al. (2010) and Bieg et al. (2013). Goetz et al. (2010) examined the relations between university students' momentary control-value appraisals and three positive emotions (enjoyment, pride, and contentment) in everyday achievement and non-achievement settings. The results showed that perceived control and perceived value interacted to predict these emotions. Bieg et al. (2013)

investigated the links between appraisals of control and value, their interaction, and three discrete emotions (pride, anxiety, and boredom) using both trait and state assessments in four subject domains. Results from multilevel analyses showed that control, value, and their interaction predicted the emotions in the expected directions. The positive relation between control and pride was stronger when perceived value was high. The negative association between control and anxiety was also stronger when value was high. The strength of relation between control and boredom was also found to be different depending on the value appraisal. However, these two studies are limited in that only a small number of emotions were considered. Furthermore, both studies examined considered the relations between self-reported control-value appraisals and emotions, but did not consider the possible influence of both appraisals and emotions on students' performance.

3.2.4 Joint and Mediated Effects of Control-value Appraisals and Emotions on Achievement

Furthermore, the control-value framework of achievement emotions suggests that cognitive appraisals will elicit certain emotions, which will, in turn, affect learning and performance (Pekrun et al., 2007). Combined with the influence of emotions on students' achievement, the effects of control-value appraisals on emotions imply that these appraisals should impact achievement through emotions. In addition, control and value could impact achievement through additional mechanisms such as students' motivation. Supporting this reasoning, research has found that perceived control, as well as related expectancies of success and self-perceptions of competence, can influence students' motivation and achievement (Perry et al., 2001; Wigfield & Eccles, 2000).

Moreover, students' perceived control and subjective value may jointly predict academic results in a similar way as they stimulate different achievement emotions. Students who value

academic success more will likely benefit more from their high control over the exam performance, and this combined effect of control and value appraisals is transmitted through their positive emotions towards the learning activities and outcomes. That is, the higher the subjective value of achievement, the stronger the influence of students' perceived control on their performance could be. This assumption seemed to be supported by recent empirical evidence demonstrating the positive relations between control-value appraisals and learning achievement (Burić & Sorić, 2012; King & Gaerlan, 2014; Peixoto et al., 2016; Pekrun et al., 2011). Both control and value were seen to be essential for students to acquire an optimal performance (Guo et al., 2015; Nagengast et al, 2013; Trautwein et al, 2012). Therefore, it is reasonable to hypothesize that control and value appraisals may also have a multiplicative impact on students' performance. Further, considering the proposed mediation effects of emotions in the relationships between appraisals and performance, it is sensible to postulate that the joint influence of appraisals on performance will be mediated by achievement emotions.

In second language contexts, studies addressing the influence of appraisals on emotions and language learning are largely lacking, although the extant literature on L2 self-efficacy or perceived competence can be seen as representing forms of control-related appraisal (Hsieh & Schallert, 2008; MacIntyre & Charos, 1996). Findings from these studies showed that students' self-efficacy tended to be positively related to language learning strategies, motivation, self-regulation and performance, but was negatively related to their levels of language anxiety (Kim et al., 2015; Sardegna, Lee, & Kusey, 2018). To the authors' knowledge, no studies have investigated the interactive effects of control and value appraisals in the second language context. Nevertheless, considering the prominent effects of cognitive appraisals on emotions and learning in general and the paucity of relevant research in L2 society, this line of research certainly warrants more attention.

3.3 Aims and Hypotheses of the Present Study

The present study makes an initial attempt by introducing and testing the assumptions of the control-value theory of achievement emotions into the field of second language learning. In doing so, it also extends upon previous research by unveiling the moderation and mediation mechanism underlying the links between appraisal antecedents, achievement emotions, and their learning outcomes. The findings are expected to advance our knowledge on the pivotal roles of appraisals and emotions in L2 learning and provide an empirical basis to derive recommendations for teachers on how to foster students' emotions in and out of the classroom. Based on existing literature, Figure 1 depicts a conceptual model linking the proposed relationships among major variables under the study.

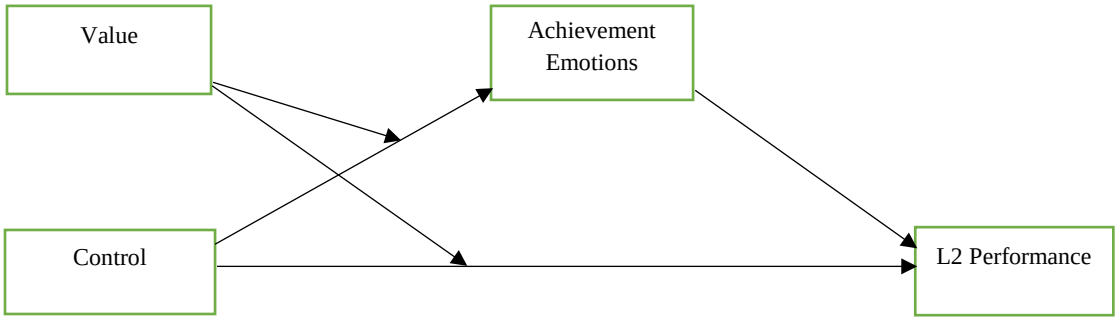


Figure 1
Theoretical model linking appraisals, achievement emotions and L2 performance.

Succinctly state, we tested the following hypotheses:

Hypothesis 1 Control and value appraisals positively correlate with positive emotions and L2 performance but negatively correlate with negative emotions.

Hypothesis 2 Control and value appraisals will interact to predict the eight focal emotions.

Hypothesis 3 Control and value appraisals will interact to predict L2 performance.

Hypothesis 4 Emotions are mediators in the link between control-value appraisals and L2

performance.

3.4 Method

3.4.1 Participants and procedures

Participants were 550 freshmen (500 female and 50 male) recruited from a foreign language studies university in Southeastern China (age: M = 19.66 years; SD = .76). Participants were enrolled in a required comprehensive English course. They were informed about the general purpose and the voluntary nature of participating in this research by their teachers at the beginning of the semester. Participants completed the measures in three different sections. Perceived control and perceived value were assessed in the 5th week of the semester, at a point in time when students have undoubtedly formed appraisals for the course. Achievement emotions were measured in the 17th week of the semester, when students were preparing for their exam (6 days before the exam). In the 18th week, participants completed the final course exam. Exam performance data and prior English achievement were obtained from the head teacher of the course at the end of the semester. This prospective design provided clear temporal separation of all measures in the study. For all assessments, participants were assured that their responses would remain confidential and would in no way influence their course grade. The two questionnaire measures were presented in both English and Chinese to avoid potential cultural misunderstanding.

3.4.2 Measures

Control and value appraisals. Students' course-related perceived control was assessed by an 8-item version of Perry et al.'s (2001) Perceived Academic Control Scale and the Self-Efficacy for Learning and Performance Scale of the Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich et al., 1991). The Perceived Academic Control Scale consists of four items assessing students' self-perceived ability to influence academic performance (e.g., "I

have a great deal of control over my academic performance in this English exam"; α = .72). The four items of the Self-Efficacy for Learning and Performance Scale pertain to students' confidence about being able to master academic tasks and get good grades (e.g., "I'm confident I can do an excellent job on the assignments and tests in this course"; α = 73). Participants responded to a 5-point scale (1 = *strongly disagree* to 5 = *strongly agree*), and the scores were summed to form the control indexes (α = .82). Perceived lesson value was assessed with an 8-item version of the Task Value Questionnaire (Pekrun & Meier, 2011). The scale measures students' intrinsic, utility and attainment value related to the course (e.g., "In general, I find learning for this course very interesting"; "It is very important to me to get good grades in this course". 1 = *not at all true of me*, 5 = *very true of me*; α = .80).

Achievement emotions. The learning-related emotion scales of the Achievement Emotions Questionnaire (Pekrun et al., 2011) were used to assess participants' emotions prior to the exam. These scales address both activity-related emotions and outcome-related emotions. Using a situation-reaction questionnaire format, the instructions for the measure provided a description of the exam-related situation the assessment refers to and then asked respondents to report how they felt about preparing for the exam. The scales assess eight different emotions: enjoyment (10 items; e.g., "I enjoy dealing with the course material"), hope (6 items; e.g., "I feel confident when studying"), pride (7 items; e.g., "I'm proud of myself"), boredom (8 items; e.g., "Studying for my courses bores me"), anger (8 items; e.g., "I get angry while studying"), anxiety (8 items; e.g., "I get tense and nervous while studying"), hopelessness (8 items; e.g., "I feel hopeless when I think about studying"), and shame (8 items; e.g., "I feel ashamed"). Participants responded on a 1 (*not at all*) to 5 (*very much*) scale, and the scores were summed to form the emotion indexes (enjoyment α = .88, hope α = .86, pride α = .83, boredom α = .85, anger α = .85, anxiety α = .81, hopelessness α = .87, shame α = .84).

Exam performance. Participants' score on their final course exam was used as a measure of

performance attainment. The exam paper was developed based on the textbook of the course, including quiz, close-test, multiple choice questions and composition. It focused on testing students' reading and writing skills in response to the course content. The exam was scored on a low-high range of 0 to100.

Covariates. Gender was controlled as a covariate because of the uneven distribution between female and male in the present sample. Moreover, previous research showed that girls tended to report both more intense positive and negative emotions than boys (Frenzel et al., 2007). Meanwhile, students' previous English achievement as measured by their college entrance exam was included as a covariate. Previous achievement has been shown to have significant effects on students' academic self-concept and achievement emotions (Marsh & O'Mara, 2008; Pekrun et al., 2014).

3.5 Results

Table 1 presents the means, standard deviations, and correlations among the study variables. In line with Hypothesis 1, control and value appraisals had significant positive correlations with positive emotions (enjoyment, hope, and pride) and L2 performance and significant negative correlations with negative emotions (boredom, anger, hopelessness and shame), except for the correlation between value and anxiety which was non-significant. In turn, pleasant emotions were positively related with L2 performance whereas the opposite trend was observed for unpleasant emotions. In addition, the averaged means were higher for appraisals and positive emotions than for negative emotions. The magnitude of the correlations was stronger among emotions with the same valence.

To test Hypothesis 2 which posits the combined predictive effects of control and value appraisals on achievement emotions, multiple hierarchical regression analyses were conducted. Following Cohen et al. (2003), control and value appraisals were mean centered and

standardized to reduce multicollinearity between the main effect and the interaction term, and to ensure that the interpretation of the effects would occur at a meaningful value. Then, the two appraisal variables and their product term were entered into the regression models step by step.

Table 1
Descriptive Statistics and Intercorrelations for the Study Variables.

	M	SD	1	2	3	4	5	6	7	8	9	10
Control	3.33	.63										
Value	3.36	.62	.27**									
Enjoyment	3.11	.62	.58**	.47**								
Hope	3.07	.67	.58**	.39**	.78**							
Pride	3.26	.66	.53**	.40**	.82**	.76**						
Boredom	2.48	.65	-.46**	-.21**	-.55**	-.57**	-.44**					
Anger	2.36	.66	-.38**	-.09*	-.41**	-.46**	-.35**	.70**				
Anxiety	2.67	.58	-.41**	-.01	-.37**	-.47**	-.31**	.65**	.64**			
Hopelessness	2.04	.59	-.47**	-.16**	-.48**	-.52**	-.41**	.75**	.67**	.72**		
Shame	2.47	.61	-.42**	-.10*	-.41**	-.46**	-.36**	.60**	.58**	.70**	.69**	
Exam	66.50	8.76	.41**	.26**	.40**	.35**	.36**	-.26**	-.13**	-.18**	-.33*	-.21**

*p < .05; **p < .01.

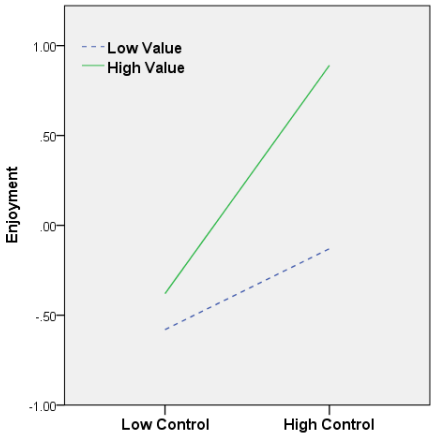
As demonstrated in Table 2, control and value appraisals had significant positive effects on enjoyment (β = .42/.30 for control/value; p < .01), hope (β = .46/.23; p < .01) and pride (β = .41/.26; p < .01). These main effects were further qualified by effects of the control × value interaction term on enjoyment (β = .26; p < .01), hope (β = .21; p < .01) and pride (β = .18; p < .01). To graphically examine these interaction effects, simple slops were plotted by using representative z-score points at high and low (±1 SD) levels of control and value appraisals (Cohen et al., 2003). As presented in Figure 2, the relationships between control and the three positive emotions (enjoyment, hope and pride) were stronger when value was high. Students with high control and high value reported stronger positive emotions than those with either low control or low value.

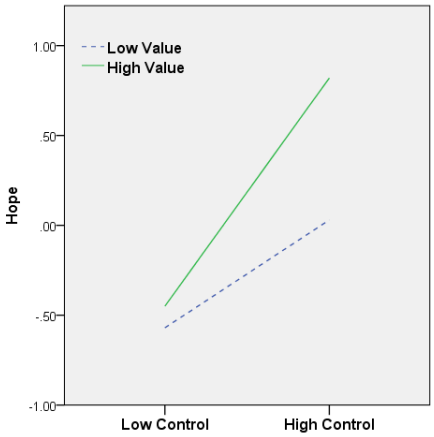
Table 2
Hierarchical Regression Coefficients for Appraisals, Emotions and L2 Performance.

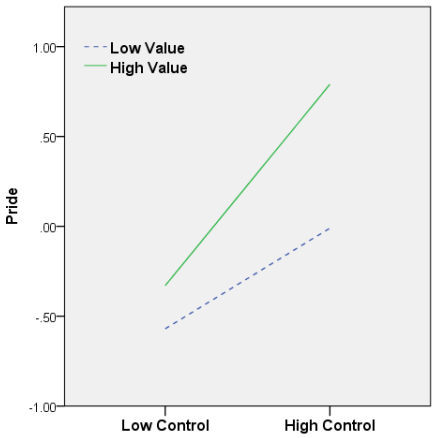
	JO	HO	PR	BO	AG	AX	HL	SH	L2P
Predictor	β(SE)	β(SE)	β(SE)	β(SE)	β(SE)	β(SE)	β(SE)	β(SE)	β(SE)
Control	.42**	.46**	.41**	-.39**	-.35**	-.40**	-.42**	-.38**	.34**
	(.03)	(.04)	(.04)	(.04)	(.04)	(.04)	(.04)	(.04)	(.56)
Value	.30**	.23**	.26**	-.07	.02	.13**	-.03	.03	.15**
	(.03)	(.04)	(.04)	(.04)	(.04)	(.04)	(.04)	(.04)	(.59)
Control × Value	.26**	.21**	.18**	-.18**	-.14**	-.14**	-.15**	-.14**	.09*
	(.04)	(.05)	(.05)	(.05)	(.06)	(.05)	(.05)	(.05)	(.70)
Total R^2	.51**	.44**	.38**	.25**	.16**	.19**	.19**	.18**	.20**
ΔR^2	.06**	.04**	.03**	.03**	.02**	.02**	.02**	.02**	.01*

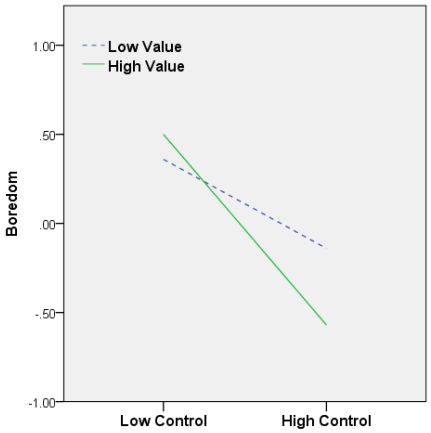
Note. All coefficients are standardized and based on models with all primary variables and covariates entered. Standard errors are in parentheses. JO = Enjoyment; HO = Hope; PR = Pride; BO = Boredom; AG = Anger; AX = Anxiety; HL = Hopelessness; SH = Shame; L2P = L2 Performance. *p < .05; **p < .01.

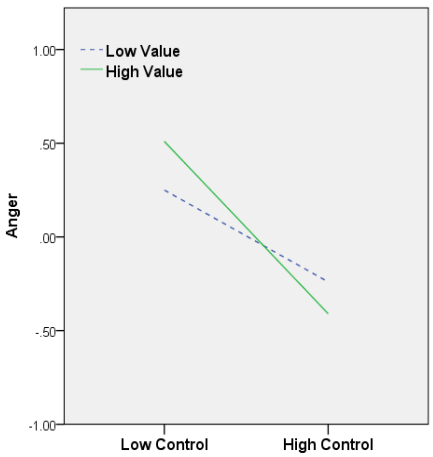
Moreover, control appraisal had significant negative effects on boredom (β = -.39; p < .01), anger (β = -.35; p < .01), anxiety (β = -.40; p < .01), hopelessness (β = -.42; p < .01) and shame (β = -.38; p < .01); while value appraisal only had a significant positive effect on anxiety (β = .13; p < .01) among negative emotions. However, the interactive effects of control-value appraisals were significantly negative for all negative emotions: boredom (β = -.18; p < .01), anger (β = -.14; p < .01), anxiety (β = -.14; p < .01), hopelessness (β = -.15; p < .01) and shame (β = -.14; p < .01). As can be seen from Figure 2, the negative associations between control and the five negative emotions were stronger in cases of high value. Further, at the low end of control, students with high value appeared to experience more negative emotions, but the opposite trend has been observed when their control is high (except for anxiety which was close for both value groups).

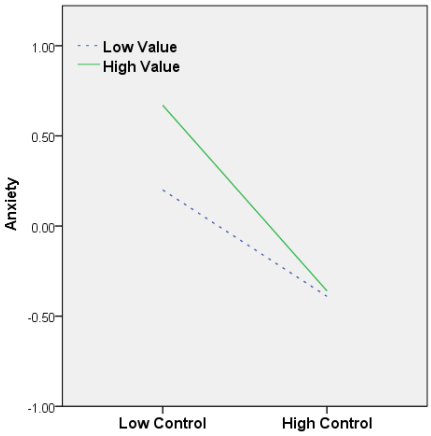

Low Value
High Value
Enjoyment
1.00
.50
.00
-.50
-1.00
Low Control
High Control


Low Value
High Value
Hope
1.00
.50
.00
-.50
-1.00
Low Control
High Control


Low Value
High Value
Pride
1.00
.50
.00
-.50
-1.00
Low Control
High Control


Low Value
High Value
Boredom
1.00
.50
.00
-.50
-1.00
Low Control
High Control


Low Value
High Value
Anger
1.00
.50
.00
-.50
-1.00
Low Control
High Control


Low Value
High Value
Anxiety
1.00
0.50
0.00
-0.50
-1.00
Low Control
High Control

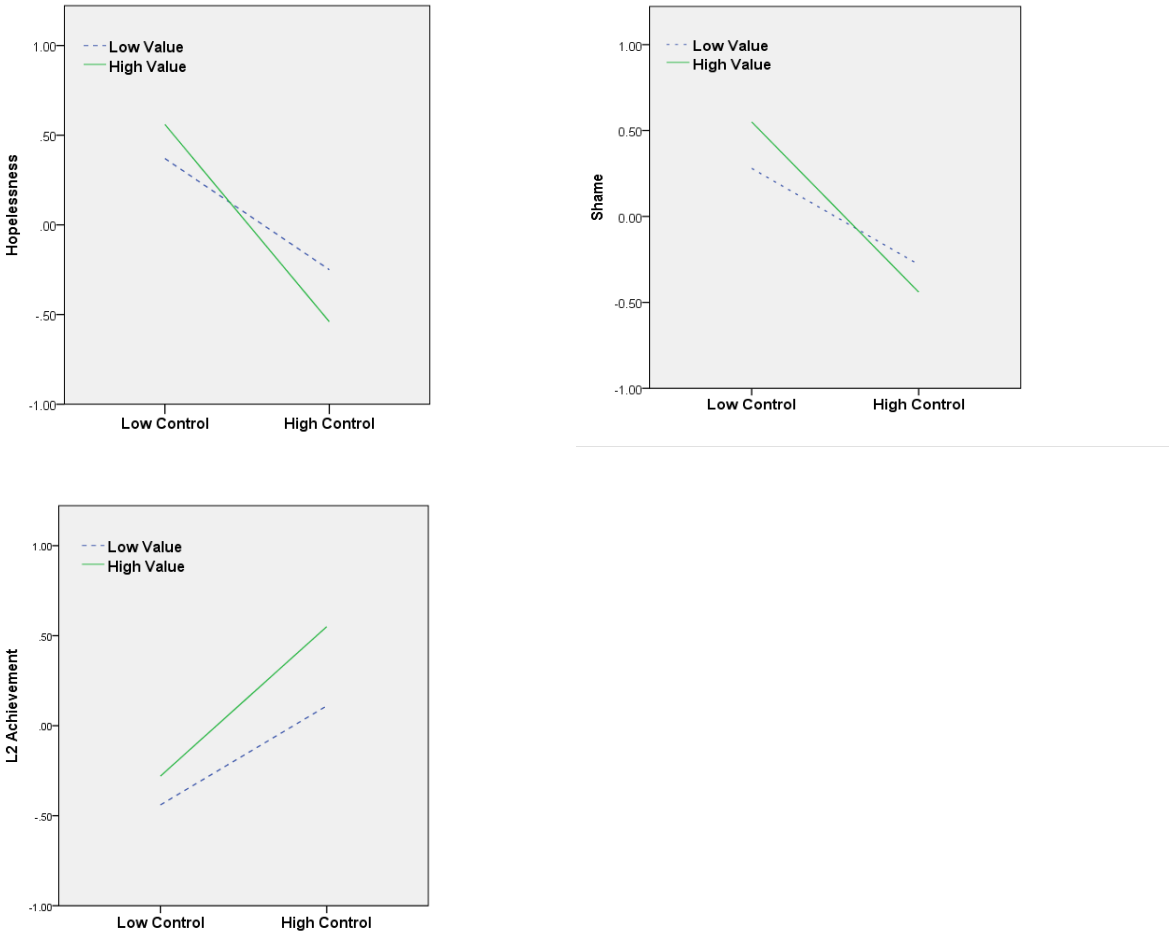


Figure 2

Interaction effects of control and value appraisals on achievement emotions and L2 performance.

Hypothesis 3 predicts similar interactive effects of control and value appraisals on L2 performance. Employing the same regression practice mentioned earlier, results obtained in Table 2 shows that control and value appraisals had significant positive effects on L2 performance (β = .34/.15 for control/value; p < .01). These main effects were further qualified by a control × value interaction on L2 performance (β = .09; p < .05) comparable with the ones reported above on positive emotions. To visualize this interaction effect, the same graphing procedures described earlier was used. As shown in Figure 2, the relation between control and L2 performance was indeed stronger in the high value group. Students in the high value group outperformed those in the low value group at both low and high ends of control.

Hypothesis 4 proposes that the interactive effects of control and value appraisals on L2 performance are carried in part indirectly through achievement emotions. Following Hayes' (2013) and Preacher et al.'s (2007) recommendation, regression-based bootstrap analyses were used to estimate the conditional indirect effect of control on L2 performance through emotions at low and high (±1 SD) levels of value. All independent variables were standardized before the analyses. As shown in Table 3, bootstrap confidence intervals indicated that the indirect and positive effects of control on L2 achievement through emotions were significant for all positive emotions (enjoyment, hope, and pride) at the lower and upper values. However, this conditional indirect effect was only significant for hopelessness among negative emotions at both low and high value groups.

Table 3
Conditional Indirect Effects of Control Appraisal on L2 Performance Through Achievement Emotions.

Value	Emotion	Boot effect	Boot SE	LLCI	ULCI	Emotion	Boot effect	Boot SE	LLCI	ULCI
-1 SD	JO	.37	.15	.13	.73	AG	-.09	.09	-.31	.06
1 SD		1.03	.33	.43	1.73		-.18	.17	-.51	.15
-1 SD	HO	.29	.14	.05	.61	AX	.06	.09	-.11	.27
1 SD		.62	.30	.05	1.23		.11	.16	-.21	.44
-1 SD	PR	.32	.13	.10	.63	HL	.42	.15	.18	.77
1 SD		.64	.26	.18	1.19		.74	.24	.32	1.25
-1 SD	BO	.14	.10	-.01	.43	SH	.11	.10	-.07	.34
1 SD		.30	.21	-.10	.72		.19	.17	-.14	.54

Note. Bootstrap sample size = 10000. All independent variables were standardized. 95% Bias-Corrected confidence interval are reported. LLCI = Lower limit confidence interval, ULCI = Upper limit confidence interval. JO = Enjoyment; HO = Hope; PR = Pride; BO = Boredom; AG = Anger; AX = Anxiety; HL = Hopelessness; SH = Shame.

Using the graphing techniques described by Hayes (2013) and Preacher et al. (2007), the conditional indirect effect was plotted with value on the X-axis, and the indirect effect on the Y-axis. As can be seen from Figure 3, the conditional indirect effects of control on L2 performance through enjoyment, hope, pride and hopelessness were consistently positive and

went up as value increased. The higher the value, the stronger are the relations between control and emotions (positive for enjoyment, hope, and pride; negative for hopelessness), which in turn resulted in higher level of L2 performance.

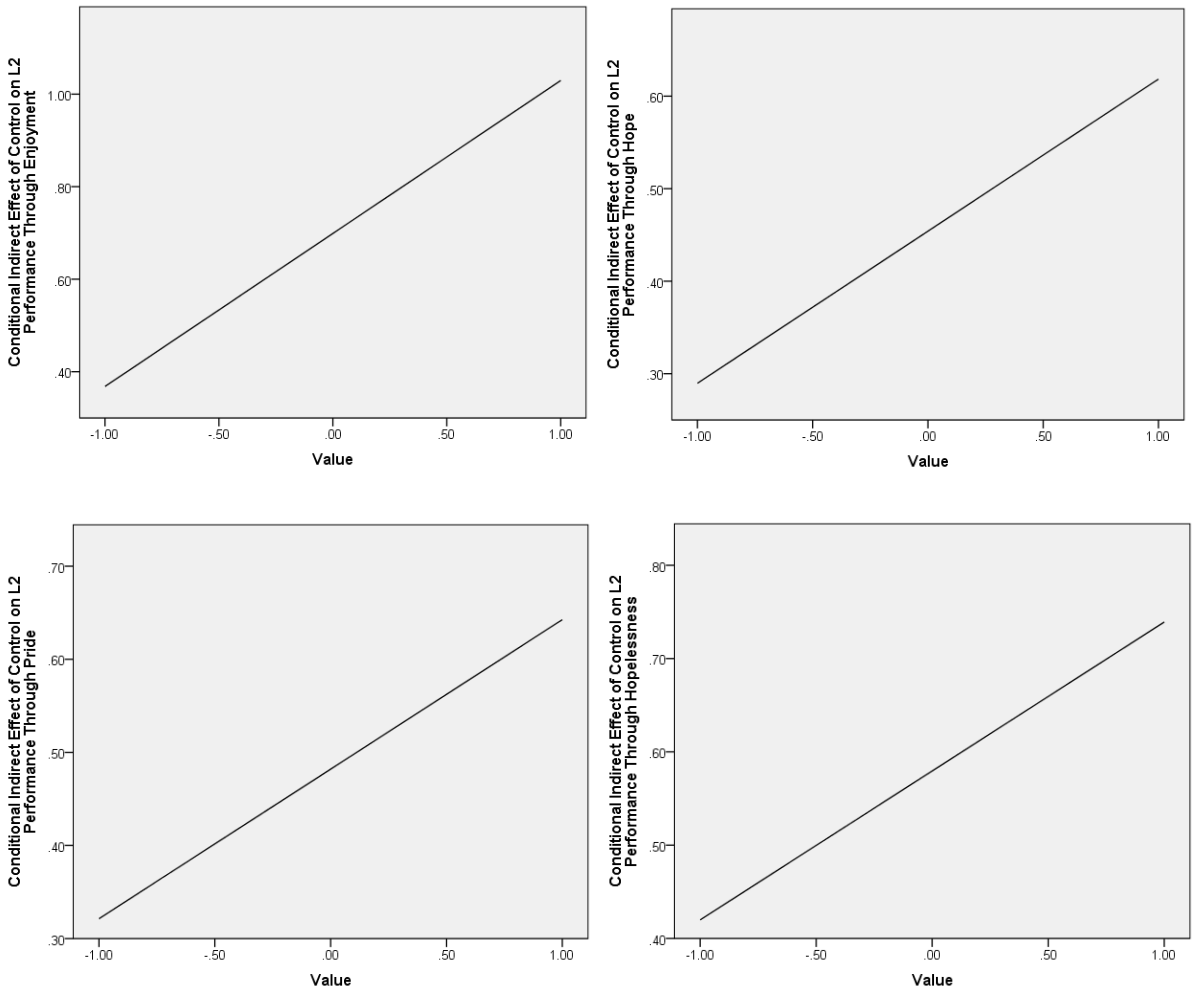


Figure 3
Conditional indirect effects of control on L2 performance through achievement emotions as a function of value. The Y-axis corresponds to the estimated differences in L2 performance between students at relatively high versus low values. The slopes of the lines represent how much the effect of perceived control on L2 performance through emotion is influenced by individual differences in perceived value.

3.6 Discussion

The present study explored the relations among appraisal antecedents, achievement emotions and L2 performance. The study also evaluated both the independent and the

interactive effects of control and value appraisals on achievement emotions and L2 performance. The analyses further investigated the interactive effects of control-value appraisals on L2 performance through achievement emotions. Consistent with Hypothesis 1 and past work (Artino & Jones, 2012; Burić & Sorić, 2012), perceived control and perceived value were positively related to positive emotions (enjoyment, hope and pride) and negatively related to all negative emotions (boredom, anger, hopelessness and shame) but anxiety. That is, students reported higher levels of positive emotions and lower levels of negative emotions when they felt more competent about language learning and found the learning activities and outcomes important and interesting. Moreover, these students were more likely to achieve better L2 performance as shown from the positive relations between control-value appraisals and L2 achievement. The positive relations between positive emotions and L2 achievement and the negative trend for negative emotions also corroborated the findings in Lee's (2014) study.

With regard to the non-significant relation between value and anxiety, this seems to be supported by recent research which has documented that the relation between value and anxiety can be either positive, negative or non-significant (Ahmed et al., 2010; Bieg et al., 2013; Pekrun et al., 2011). One possible reason may be that the scales used to measure value in these studies, as was also the case in the present study, didn't distinguish between intrinsic, utility and attainment values (Pekrun & Meier, 2011). For intrinsic and utility values, they are assumed to be negative or unrelated to anxiety, but the relation is assumed to be positive for negative attainment value, and thus resulted in the inconsistent findings (Pekrun et al., 2007).

In line with Hypothesis 2, control and value appraisals interactively predicted all eight focal emotions. For positive emotions, one possible explanation for this interaction is that students' perception of control may exert more influence on their pleasant emotions in learning activities which were more valued by them. For negative emotions, this interactive effects could be interpreted as suggesting that students' perception of control may more strongly affect their

unpleasant feelings in learning activities which were highly valued by them. Moreover, students who had high value but low control for L2 performance tended to feel more negative emotions compared with those who had both low value and low control. In contrast, students who had both high value and high control over the learning subject experienced less negative emotions in comparison to those who have low value but high control (for anxiety it was close). All these interactive effects are in support of the control-value theory's assumptions on the multiplicative impact of control and value appraisals on academic emotions (see section 2.2). To our knowledge, the present study is the first to provide empirical support for the added combined effects of control and value appraisals on the full range of achievement emotions controlling for the constituent main effects.

In addition to the interactive effects above, the present study also found significant control × value interactions in the prediction of L2 performance as stated in Hypothesis 3. This interaction term may be explained to indicate that students' perceived control may have stronger influence on L2 performance among those who attached more subjective value to language learning. This finding is congruent with our afore-mentioned assumption extended from the expectancy-value theories and the CVT (Atkinson, 1964; Pekrun et al., 2002). To our knowledge, this assumption has not been empirically tested on exam performance. It is important to note that this interaction could also be depicted as suggesting that students' perceived value may have more influence on L2 performance among those who afforded greater personal control on language acquisition. This symmetrical nature of control and value appraisals applies to all the interaction effects mentioned in the present study.

Finally, bootstrap regression analysis showed that the interactive effects of control and value appraisals on L2 performance were mediated by enjoyment, hope, pride and hopelessness, which provided partial support for Hypothesis 4. These conditional indirect effects could be interpreted as implying that students' perception of control may exert a continually stronger

influence on emotions and increase with their beliefs about the value of language learning, and these more joyful, hopeful, and proud and less hopeless emotions in turn lead them to achieve a better score in the exam. This finding is in line with recent research (Peixoto et al., 2016; Luo et al., 2016) as well as the cognitive-mediational model of achievement emotions (Pekrun, 2006) that emphasizes the mediating role of emotions between cognitive appraisals and academic achievement. More importantly, the present finding can be seen as evidence of the integration of the multiplicative impact of control-value appraisals into the mediational framework of achievement emotions and thus extends our knowledge on the interplay between emotions and their appraisal antecedents and learning outcomes. As for the non-significant indirect effects among anger, boredom, anxiety and shame, it may be that the influence of these emotions on L2 achievement were relatively weak in the present investigation (see the correlations in Table 1), and therefore their effects on L2 performance were masked by those of control and value.

Limitations and Future Directions

Several limitations of the present study should be taken into account and may be used to suggest directions for future research. First, the present study employed an interindividual approach to analyze the between-person relations of appraisals, emotions and performance (assessed once per person) and thus provided an overall cognitive schema about cognitions, emotions, and learning. However, it is also important to investigate how appraisals of control and value, emotions, and achievement are connected within-person. Drawing conclusions about intraindividual functioning from interindividual data can become problematic as it involves interpreting data on a lower level that are in fact aggregated on a higher level (Hox, 2010). Future research may use methods such as experience sampling design (Goatz et al., 2010) to test the present findings from an intraindividual perspective on a full range of emotions.

Second, the present study examined only two types of appraisals as antecedents of achievement emotions. This may bias our knowledge on the relative importance of control and value as emotion antecedents. Future studies may also explore the relations between emotional experiences and additional appraisal dimensions such as goal congruency, expectedness and probability, or anticipated effort and attention (Roseman, 2001) so that a core of appraisal constructs relevant to emotional experiences may be identified in order to best inform future interventions. Moreover, more distal classroom environmental factors (e.g. classroom climate, classroom goal structures, teacher and peer support) (Pekrun et al., 2002) which influence both appraisals and emotions are also worth investigating in order to uncover a more comprehensive mechanism that works on learning.

Third, although the present research adopted a longitudinal design to examine the influence of appraisals on emotions and the joint influence of appraisals and emotions on L2 performance, the present data structure is correlational in nature thus precluding casual conclusions. As explicitly noted by Pekrun et al. (2007), achievement normally acted back on emotions and emotions and achievement can also shape appraisals. Indeed, empirical research has shown that prior academic achievement was one of the most important predictors for students' subsequent emotions and their control and value appraisals (Peixoto et al., 2016; Pekrun et al., 2011). Similarly, emotions also reversely predicted cognitive appraisals (Marsh & Ayotte, 2003). As such, future research would do well to address the reciprocal links among appraisals, emotions and L2 performance.

Finally, the present study used students' course-related exam as a measure of L2 performance. However, the exam paper tested only reading and writing proficiency regarding the content of the lesson. Despite the moderate to high correlations among different language skills, there are important distinctions between each aspect of L2 acquisition, with receptive skills usually easier than productive skills (Carson et al., 1990; Lund 1991). Such different

acquisition processes may stimulate different levels of appraisals and emotions (Arens & Jansen, 2016; Horwitz, Horwitz, & Cope, 1986). For example, Chinese EFL (English as a Foreign Language) students tended to lack of control and worry more about their speaking compared with other language abilities, due to the limited exposure to authentic communication (Shao, Yu, & Ji, 2013). Future studies could examine whether the present findings are applicable to different dimensions of language learning and whether there are differences with respect to the relations among appraisals, emotions and performance between these contexts.

Implication

From a practical perspective, the present findings bear important applications for educators. First, our data suggests that perceived control was a critical antecedent of emotions and L2 performance. Accordingly, L2 intervention designers may consider incorporating language classes with the current control retraining program so as to promote L2 achievement both directly through enhancing perceptions of control and indirectly through cultivating positive emotions and reducing negative emotions (Hall et al., 2006; Seligman & Csikszentmihalyi, 2000; Shao, Yu, & Ji, 2012). For example, by adopting problem-oriented coping strategies and goal-oriented training methods, teachers can gradually enable students to become more assured and satisfied with their language learning, which eventually leads to higher proficiency (Skinner et al., 2003; Nelis et al., 2009).

Second, our findings also reveal the impact of value on emotions and L2 performance. This suggests that material developers should pay attention to resources that bear personal relevance and interests to students (Rouhani, 2008). For example, the current tertiary English in China uses the same textbook for all non-English major students. It is attempting to think that using major-tailored text materials may be beneficial for both their emotional experiences and language development. Moreover, teachers can integrate language training into real-world tasks

and help students learn on the job (Ellis, 2003). This would, in turn, contribute significantly to more positive experience and engagement in their students. Nevertheless, it should be cautioned that an overemphasis of utility and attainment values could also intensify negative emotions (e.g. anxiety; Pekrun & Perry, 2014). Thus, teachers are advised to underscore these extrinsic values only to a reasonable degree, especially when students' control beliefs are low.

Third, in line with the interactive effects of control and value, our findings further imply that the most effective way to foster emotional experience and L2 development would involve programs that promote both appraisal constructs. For example, personal value-based writing programs aiming at enhancing emotional health and L2 performance (McCullough, Root, & Cohen, 2006; Shao, Yu, & Ji, 2012) may be incorporated into existing attributional retraining programs that encourage greater perceived control (Hall et al., 2007). Alternatively, the effectiveness of control-enhancing programs on emotions and achievement may be more readily observed in situations of greater personal value to students (such as major courses vs. selective courses).

Finally, the present research suggests that language teachers should be explicitly informed of the importance of control and value in connection with students' emotions and L2 achievement. Teachers should be encouraged to structure classroom environments that facilitate L2 learning via control and value beliefs and adaptive emotions. This can be achieved, for instance, by supporting autonomy and cooperation, adopting "cognitive and emotional scaffolding", building clear goal structures, or fostering self-regulation (Meyer & Turner, 2007; Pekrun et al., 2007). Through translating such knowledge into practice, teachers can provide students with a cognitively challenging and emotionally sound environment that ultimately promotes language learning and development.

Emotion Transfer in the Classroom: Exploring the Relationship Between Peer and Student Emotions

The present study examined the connections between peer and student emotions in their English classrooms. Based on theories of emotion contagion and social appraisal in affect transfer and the control-value theory of achievement emotions, the authors hypothesized (a) that perceptions of peer enjoyment, anxiety and boredom within classrooms are positively linked with students' corresponding enjoyment, anxiety and boredom, and (b) that students' control and value appraisals mediate the relationships between perceived peer and student emotions. Data were collected from 103 seventh-ninth grade classrooms (N = 3643) using self-report questionnaire. Multilevel structural equation modeling showed that perceptions of peer emotions and student corresponding emotions were positively related at both individual and classroom levels. Moreover, the effects of perceived peer emotions on corresponding student emotions were mediated by control and value appraisals at the individual level. However, the mediation effects were only significant at the class level for control appraisal as a mediator of effects on anxiety, and for value appraisal as a mediator of effects on boredom. Effects were robust across grade level, gender, and previous achievement. The discussion highlights the role of classroom-based emotion interactions in promoting academic development.

Keywords: **emotion, transfer, contagion, appraisal, peer, student**

4.1 Introduction

Emotions are of critical importance for students' learning and achievement. Research has clearly documented that positive achievement emotions such as enjoyment and hope positively affect engagement and performance by increasing interest, motivation, effort, self-regulation of learning, use of flexible and deep learning strategies, and the availability of cognitive resources for task purposes (Artino et al., 2010; Pekrun et al., 2011). Conversely, negative achievement emotions such as anxiety and boredom typically diminish interest and motivation, undermine self-regulation, prompt the use of more rigid and superficial learning strategies, and cause irrelevant thinking, which reduces the cognitive resources available for ongoing tasks, leading to worse performance (Daniels et al., 2009; Goetz et al., 2012). Given the relevance of emotions for learning and performance, it is important to enhance our knowledge of the antecedents of achievement emotions. Previous research tended to address these antecedents from an individualistic perspective (e.g. Goetz et al., 2007); however, it can be assumed that these emotions are not experienced in a vacuum, but rather are influenced by other people (i.e. teachers and peers) in the micro-context of the classroom (Parkinson & Manstead, 2015; Pekrun & Perry, 2014).

The present study extends previous research by considering the informational and affective consequences of perceived peer emotions on students' emotions. In particular, we consider two ways in which peers' enjoyment, anxiety and boredom may influence students' own corresponding emotions towards language learning, the first based on social appraisal (Manstead & Fischer, 2001), and the second based on emotion contagion (Hatfield, Cacioppo, & Rapson, 1994). Moreover, based on the control-value theory of achievement emotions (Pekrun, 2006), we consider two types of cognitive appraisals, namely, perceived control and perceived value, as potential mediators in the process of social appraisal. Furthermore, benefiting from recent method advancement in doubly-latent multilevel analyses (Marsh et al.,

2012), we investigated our hypotheses at both the student level and the classroom level in order to acquire a more comprehensive understanding of how such a mechanism functions in educational context.

4.2.1 Emotion Transmission in the Classroom

Social-cognitive learning theories (Bandura, 1977; Pekrun, 2000) suggest that students' emotions are likely to be influenced by their peers' or teachers' thoughts, feelings and behaviors. Students may learn that a topic or learning task is interesting by feeling a teacher's enthusiasm, or by observing their peers' enjoyment of the learning content. By contrast, they may feel anxious about an exam due to teachers' past criticism, or as a result of watching peers' worried faces. In school life, students spend a larger amount of time in the company of peers, but most research to date has dealt with relations between teacher and student emotions, leaving the influence of peer emotions largely neglected (Dijkstra & Veenstra, 2011; Horwitz, 1996). For example, in a longitudinal study, Frenzel et al. (2009) examined the relationship between teacher and student enjoyment. Findings from multi-level analyses showed that teacher and student enjoyment were positively related even when controlling for students' previous mathematics enjoyment, and that the effect of teacher enjoyment on student enjoyment was mediated by teacher enthusiasm.

Despite the lack of attention to emotional influence from peers, some evidence from laboratory and field studies provides indirect support for its operation. Fischer et al. (2004) investigated the impact of peers' emotional reactions on participants' own emotions in a feedback manipulation task. Participants were asked to report their emotions towards unfair treatment in the classroom with two types of emotional response (angry vs. sad) from peers as reference. Results revealed that when others expressed anger, participants reported more intense anger themselves, and when others expressed sadness, participants reported more

intense sadness. The findings also showed that the extent of emotional assimilation depended on participants' interpersonal orientation and the extent to which others' emotions were recognized and processed. Similarly, Tickle-Degnen and Puccinelli (1999) investigated the emotional responses of students within a dyad during the process of receiving occupational therapy. Their results obtained from the study showed that when students conducted interviews in pairs, their feelings and behaviors were associated with the degree of negative emotionality and expressiveness of the other students. Students reacted with less postive feelings and behaviors when their peers had a higher level of negative emotions and were more expressive. Taken together, these studies demonstrate that students tend to experience and show similar emotions when they are exposed to the same emotional events. The researchers asserted that this emotional assimilation is not simply the result of automatic mimicry, but rather involves using peers' emotions as a source of information about appraisal of an emotional event (Fischer et al., 2004).

4.2.2 Emotion Contagion and Social Appraisal in Emotion Transfer

Emotion contagion and social appraisal are two influential accounts of interpersonal affect transfer in social psychology (Parkinson, 2011). Emotion contagion postulates a natural tendency to mimic other people's expressions and postural changes during interpersonal interaction. Self-perception of these copied movements in turn produces corresponding emotional experiences via feedback processes (Hatfield, Cacioppo, & Rapson, 1994). For example, we may simply feel happy after interacting with a cheerful person. By contrast, the social appraisal theory suggests that one person's emotion affects a second person's emotion because of its effects on the second person's appraisals. In particular, individuals may take other people's feelings into account when arriving at evaluations of the emotional significance of what is happening (Manstead & Fischer, 2001). For instance, we may become more anxious

about an event when our companion's anxiety makes us aware of risks that we had not previously considered. The distinction between these two perspectives hinges on the role of appraisals in interpersonal affect transfer. Social appraisal occurs because someone else's perceived affect carries information that alters our appraisal of the meaning of events and subsequent emotions. In emotion contagion, however, we catch another person's affect automatically and without necessarily registering its personal significance (Parkinson & Simons, 2009).

Ample evidence already supports the operation of these two processes in emotion transfer (Bayliss et al., 2007; Moody et al., 2007; Neumann & Strack, 2000; Parkinson & Simons, 2009). For example, Neumann and Strack (2000) attempted to test mood contagion in a series of experiments where participants listened to recordings of a happy, neutral, or sad voice. Mood was rated as better after exposure to the happy voice, but there were no corresponding effects of explicit registration of the other's expressed affect or awareness that affect had been influenced. On the other hand, Parkinson and Simons' (2009) diary research investigated interpersonal emotion transfer in everyday decision-making. Participants' anxiety about impending decisions was significantly affected by the reported anxiety of another person present at the time, and this affect transfer was partially mediated by appraisals of risk and importance.

Although these two perspectives have not been examined previously in classroom settings, it seems plausible to hypothesize that they are equally applicable in this school context. For example, students may get excited when watching some classmates enjoy the challenge of solving a difficult math problem without knowing what the question is (contagion). This shared enjoyment may also change students' perception of value or self-efficacy over the question, which can in turn have positive effects on their own enjoyment of learning (appraisal). By contrast, they may catch peers' anxiety immediately after seeing them nervously prepare for a high-stake exam. This may lead them to think about the negative consequence of possible

failure and worry about their own performance in the test, which further exacerbates their anxiety. Moreover, students may get a sense of their peer's control and value appraisals by observing peer emotions, and their perceptions of peer appraisals may in turn influence their own appraisals of, and emotions about, the academic situations (Hareli, 2014). These assumptions are in line with Pekrun's (2006) proposition that the classroom environment can shape students' achievement-related appraisals and emotions.

4.2.3 Control and Value Appraisals of Achievement Emotions

Control-value theory (Pekrun, 2006; Pekrun & Perry, 2014) proposes that individuals experience specific achievement emotions when they feel in control of, or out of control of, achievement activities and outcomes that are subjectively important, implying that control and value appraisals are the proximal determinants of these emotions. High perceived control and positive perceived value of achievement activities and outcomes are assumed to elicit positive emotional experiences such as enjoyment or pride, whereas low control and high negative value are expected to elicit negative emotions such as anxiety or boredom. So far, a number of studies have confirmed that positive achievement emotions are positively associated with students' control and positive value appraisals, while the opposite pattern has generally been found for negative achievement emotions (Artino & Jones, 2012; Burić & Sorić, 2012; Goetz et al., 2010; Pekrun et al., 2011).

Moreover, the control-value framework postulates that the affective impact of social environment on achievement emotions is mediated by control and value appraisals (Pekrun, 2006). Accordingly, it is assumed that features of the learning environment delivering information related to controllability and academic values are of crucial importance for students' emotions (Pekrun et al., 2007). Consistent with this assumption, recent research has shown that a classroom environment conveying positive relationships, enjoyment and mastery

goal orientation positively predicts students' academic self-efficacy, engagement and achievement and negatively predicts their anxiety at both individual and classroom levels (Arens, Morin, & Watermann, 2015; Morin et al., 2014; Reyes et al., 2012). In the present case, perceived peer emotions provide meaningful signals reflecting their appraisals of the study events. They may influence students' emotions either directly as a result of emotion contagion (Hatfield, Cacioppo, & Rapson, 1994) or by affecting students' control-value appraisals (Pekrun & Perry, 2014). Appraisal mediation would be consistent with the social appraisal account of interpersonal emotional influence in which the integration of information gleaned from others' emotions into one's own evaluation of an emotional situation plays an important role (Manstead & Fischer, 2001; Parkinson & Simons, 2009). To date, there is a lack of empirical evidence documenting the relationships between perceived peer emotions and students' achievement emotions as well as the potential mediating effects of control and value appraisals in these relations.

4.2.4 Methodological Considerations

In the present study, data from the 3643 participating students were nested within data from 103 classrooms and corresponding teachers. Therefore, testing our assumptions required a multilevel analysis approach. For perceived peer emotions, students were asked to directly rate the level 2 (L2) construct on items having the classroom as the referent, i.e. students rated all his or her classmates' emotions as a whole in the classroom. In this regard, there is a shared emotional experience among all the students' within the same class. The aggregated perceptions reflect the same underlying L2 constructs or climate, and students' ratings within the same class are theoretically 'interchangeable' (Marsh et al., 2012). Thus, it seems to be more appropriate to measure this variable at the classroom level. However, we consider that students' perception of peers' emotions is also an individual-characteristic that is unique to the person per se (Arens,

Morin, & Watermann, 2015; Frenzel et al., 2009). This part of level 1 (L1) residual variances reflects individual differences in perceptions of classroom emotions that are not accounted for by the shared emotional experience at L2. From this perspective, it is best to model the proposed relationships between peer and student emotions at both individual and classroom levels.

For control-value appraisals and achievement emotions, students were asked to rate the L1 construct on items with the individual student as the referent. Here, the L2 classroom levels of these variables are based on the class-average aggregates of individual student L1 characteristics that are specific to each person, and not interchangeable with other students in the class (Morin et al., 2014; e.g., class-average achievement, class-average SES, student gender). Thus, these constructs represent contextual variables similar to student achievement and self-concept as identified in the "big-fish-little-pond effect" (BFLPE; see Marsh et al., 2008). That is, appraisals may have distinct effects on emotions at the individual student level and at the classroom level. In this study, the relations between L2 classroom levels of control-value appraisals and student emotions represent a contextual effect and thus need to be properly estimated by controlling for the L1-effect when assessing the L2-effect (Frenzel et al., 2007b; Zeidner & Schleyer, 1998). This can be done by calculating an additional parameter representing the difference between the L2 and L1 coefficients, providing a direct estimate of contextual effects (Enders & Tofighi, 2007), with the multivariate delta method (e.g., Raykov & Marcoulides, 2004). Similarly, the indirect effects of classroom level perceived peer emotions on student emotions as mediated by control-value appraisals need to be calculated while taking into account the contextual nature of the effects of control-value appraisals on emotions.

4.3 The Present Study

The research reviewed thus far suggests that there are positive links between perceived peer

emotions and students' emotions in the classroom. However, there is a lack of large-scale quantitative evidence about this relationship. Furthermore, regarding emotional transmission from peers to students, it is plausible that control-value appraisals are mediators of the relationships between perceived peer and student emotions (Parkinson, 2011; Pekrun 2006). However, research has yet to examine social appraisal as a possible mediating mechanism by which perceived peer emotions and students' emotions are linked.

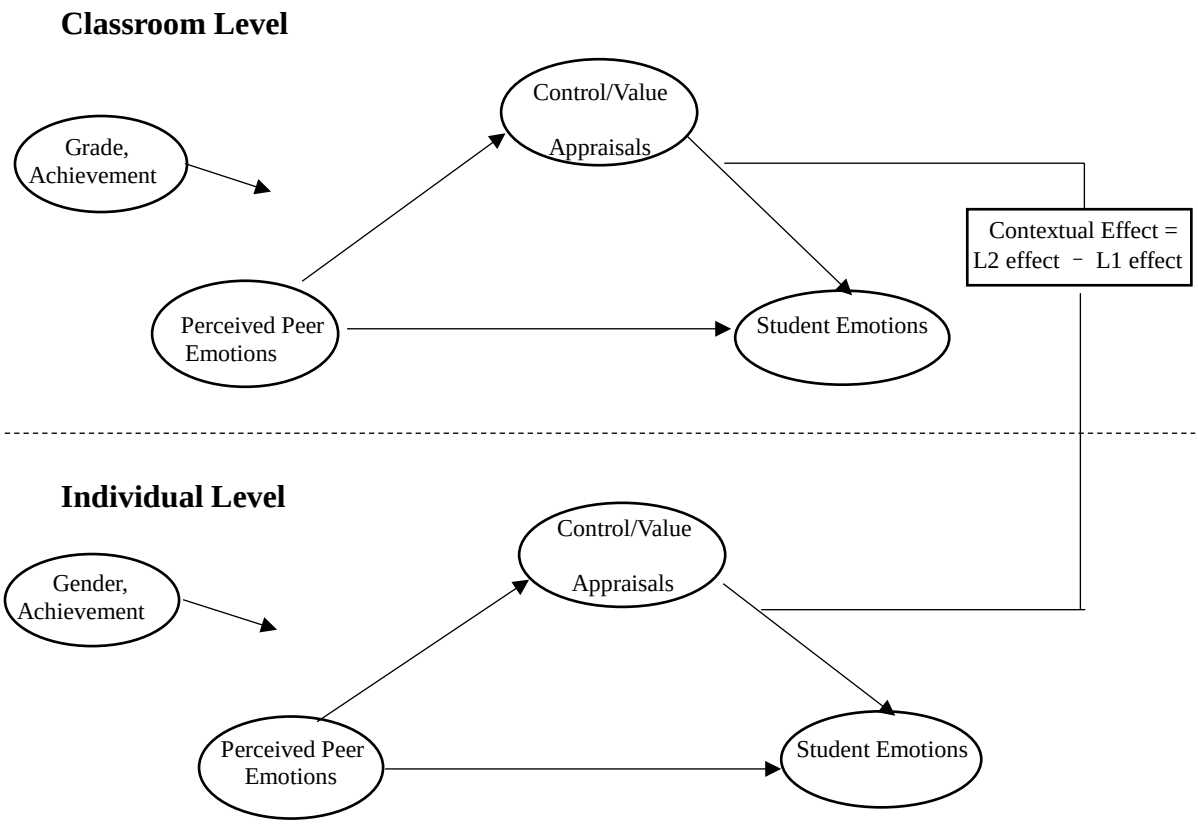


Figure 1. Multilevel structural equation model for relationships between perceived peer emotions, control-value appraisals and student emotions. Covariates and contextual effect were also depicted.

Addressing these research deficits, the present study aimed at exploring the relationships between perceived peer emotions, control-value appraisals and students' achievement emotions in language classes. In analyzing the data, we took into account the multilevel structure of the data by estimating these relations both at the classroom and at the student levels to properly

disentangle the individual versus classroom components of these relations. At the class level, the contextual nature of the effects of appraisals on emotions was also considered (see Figure 1). Succinctly stated, we tested the following hypotheses: (1) perceived peer enjoyment, anxiety and boredom will positively predict students' corresponding enjoyment, anxiety and boredom (emotion transfer); (2) perceived peer enjoyment will positively predict students' control-value appraisals and perceived peer anxiety and boredom will have a negative influence on them; (3) the relationships between perceived peer enjoyment, anxiety and boredom and students' corresponding emotions will be mediated by control-value appraisals (social appraisal) but still remain significant after controlling for the influence of appraisals (emotion contagion).

4.4 Method

4.4.1 Participants and Procedures

The sample consisted of 3643 students (54% male; mean age = 12.85, *SD* = .89) in 103 seventh-ninth grade classrooms from 6 middle schools in a city in Southeastern China. 477 participants (12% of the total 4120) were excluded from the final sample due to serious missing data (more than 50%) or apparent scrawling (e.g. out of range numbers). Among the six schools sampled, one is a migrant children school which comprised students mainly from rural family, two are lower-middle level schools, the other two are upper-middle level schools, and one is an elite private school. Such a combination is representative of the current school structure in the city. As such, the students taking part came from a wide range of socio-economic backgrounds, including both rural and city registered children. The average number of students per class was 35.37 (Minimum = 21, Maximum = 55, *SD* = 5.38).

Data were collected by trained research assistants during regular school days at the beginning of the second month in the winter semester. At this point, students have definitely

formed their perceptions of peers' emotions on English learning and their appraisals and emotions about the subject. Moreover, all the instructions in this study asked students to report their class-related emotions and appraisals in the recent two weeks so that these perceptions were more salient to them at the time of investigation. Research assistants read aloud the instructions to students and were available for responding to any questions. Teachers were not present during data collection. Since one teacher taught at least two classes in the present sample, we randomly selected one class per teacher in order to avoid a possible three-level data structure. Students were informed about the general purpose of the research and its confidential nature. Written consent forms permitting students to participate in the study were obtained from school principals.

4.4.2 Measures

Perceived peer emotions. Due to the lack of scales measuring perceived peer emotions, we developed a scale to assess students' perception of peers' enjoyment, anxiety and boredom. We modified items from the Achievement Emotion Questionnaire (AEQ; Pekrun et al., 2011) following Marsh et al.'s (2012) recommendation. Specifically, each emotion was measured by five items selected from the original scale with a uniform stem "My classmates…" used for each item sentence (e.g. Enjoyment: My classmates enjoy being in this English class. Anxiety: My classmates feel nervous in this English class. Boredom: My classmates get bored in this English class.). In this way, the referent is the classroom (or classmates as a whole) and individual students' ratings are interchangeable in relation to the classroom level of the variable in that every student is instructed to rate the same construct (Marsh et al., 2009; Morin et al., 2014). Students reported the extent to which they agreed with each statement using a 5-point Likert scale (1 = *strongly disagree*; 5 = *strongly agree*), and the scores were summed to form the perceived emotion indexes (enjoyment $\alpha = .88$, anxiety $\alpha = .82$, boredom $\alpha = .84$).

Control and value appraisals. Students' perceived control was measured by a short-version of Marsh and O'Neill's (1984) Self-Description Questionnaire (SDQ). The SDQ has also been validated in a Chinese context (Leung et al., 2016). The scale consisted of six items assessing students' self-concept concerning English study (e.g. I have always done well in English). Participants responded to a 5-point scale (1 = *strongly disagree* to 5 = *strongly agree*), and the internal consistency of the scale was high in the present study (α = .89). Students' perceived lesson value was assessed using a six-item version of the Task Value Questionnaire (Pekrun & Meier, 2011). This scale measures students' intrinsic, utility and attainment value (two items for each dimension) related to English learning (e.g., "I find learning English is very interesting"; "I think learning English is very useful for me"; "It is important to me not to get bad grades in this course". 1 = *strongly disagree*, 5 = *strongly agree*; α = .77).

Achievement emotions. Students' achievement emotions were assessed using the course-related emotion scales of the Achievement Emotion Questionnaire (Pekrun et al., 2011). By modifying the instruction of the original AEQ, the new measure provided a description of the English class related situation the assessment refers to and then asked respondents to report how they felt when sitting in the language course. The scales assessed three emotions: enjoyment (5 items; e.g., "I enjoy participating so much that I get energized"), anxiety (5 items; e.g., "I get scared that I might say something wrong in this English class") and boredom (5 items; e.g., "I find this English class fairly dull"). Participants responded on a 1 (*not at all*) to 5 (*very much*) scale, and the scores were summed to form the emotion indexes (enjoyment α = .85, anxiety α = .80, boredom α = .84).

Covariates. At the student level, gender was included as a potentially confounding covariate because girls tended to report both more enjoyment and more anxiety in academic learning (Frenzel et al., 2007a; Pekrun et al., 2011). At the classroom level, grade was included as a covariate because past research has demonstrated that this variable was negatively

associated with students' perception of classroom environment (Morin et al., 2014). Moreover, students' previous English achievement was included as a covariate at both individual and class levels. Previous achievement has been shown to have significant effects on students' academic self-concept and achievement emotions (Marsh & O'Mara, 2008; Pekrun et al., 2014).

All scales used in the present investigation were translated from English to Chinese. The English version of the questionnaire was used as the basis for translation by one educational psychologist and one bilingual English professor. The translations were then blindly back-translated by two bilingual master students in educational psychology. After this, both the Chinese and English versions of the questionnaire were presented to a translation guru and another bilingual English teacher, who further reviewed and polished the wording of the items to reach the closest possible equivalence across language versions. Finally, a pilot-test was also conducted on 104 students to check the wording and internal consistency of the new instrument. These participants were excluded from the final sample.

4.4.3 Data Analysis Strategy

In the past, many traditional classroom studies have suffered from two critical problems: (a) treating classroom constructs as a student-level (L1) variable in single-level analyses instead of a classroom-level (L2) variable in multilevel analyses; and (b) relying on manifest-variable models rather than latent-variable models that control measurement error at L1 and L2, and sampling error in the aggregation of L1 ratings to form L2 constructs (e.g. Fast et al., 2010). To overcome these two problems and keep pace with recent developments in multilevel analyses, we used M*plus* 8.0 (Muthén, & Muthén, 1998–2017) to construct our doubly-latent multilevel structural equation models (ML-SEM). The ML-SEM approach has the advantage of taking into account measurement error and sampling error at both levels and testing the hypothesized direct and indirect effects simultaneously at each level while controlling for the influence of the

other (Marsh et al., 2009). Moreover, employing this method, the validity and reliability of the measures can also be assessed across the two levels (Morin et al., 2014).

In addition, we relied on the full information maximum likelihood (FIML) method implemented in M*plus*, rather than a quasi-listwise deletion strategy, to handle missing data (Enders, 2010). FIML, especially when used in conjunction with robust Maximum Likelihood (MLR) estimator, has been found to result in unbiased parameter estimates under even very high level of missing data, and thus better represents the entire sample, rather than just the subsample of students who have no missing data. MLR has been found to be efficient in the estimation of latent-variable models based on either normally or non-normally distributed responses and items rated on scales including five or more response categories (Rhemtulla, Brosseau-Liard, & Savalei, 2012).

4.4.4 Preliminary Verification of Statistical Requirements

In doubly latent multilevel models, in addition to multicollinearity at level 1 and level 2, the reliability of the class aggregates, and of the constructs at L1 and L2, together with the verification that a priori measurement model fits the data well at both levels are important statistical requirements that should routinely be checked. First, in order to facilitate interpretation of the results and to reduce non-essential multicollinearity, all variables were standardized before analysis, and variables used only at L1 were grand mean centered whereas variables modelled at both levels were group mean centered. We also directly performed systematic tests which showed that both Tolerance (>1) and VIF (<2) values remained reasonably low. Thus, there were no potential problems of multicollinearity in individual ratings of the constructs used in the present investigation.

Next, to determine whether aggregated individual-level ratings of students' emotions, appraisals and perceived peer emotions were reliable indicators of the respective class-level

constructs, we used the intraclass correlation coefficient Type 1 and 2 (Bliese, 2000). ICC1 refers to the agreement between any pair of students within the same class and also reflects the proportion of the total variance that occurs at the second level of analysis. ICC1 thus renders an estimate of the within-class homogeneity of aggregated group-level constructs. Values of .05 or above for ICC1 can be regarded as support that there are adequate group- level properties of a variable warrant aggregation (Gavin & Hofmann, 2002). Whereas ICC1 can be interpreted as the reliability of an individual student's rating as an indicator of a class-level variable, ICC2 provides an estimate of the reliability of the class-mean rating (Lüdtke et al., 2006). ICC2 values of approximately .70 are considered to indicate sufficient reliability of class-level aggregated scores (Marsh et al., 2012). These indices were satisfactory in this study and thus justified the assessment of all the variables at class level: enjoyment (ICC1 = .09, ICC2 = .078), anxiety (ICC1 = .05, ICC2 = .66), boredom (ICC1 = .08, ICC2 = .77), perceived control (ICC1 = .07, ICC2 = .73), perceived value (ICC1 = .06, ICC2 = .68), perceived peer enjoyment (ICC1 = .13, ICC2 = .84), perceived peer anxiety (ICC1 = .06, ICC2 = .68), perceived peer boredom (ICC1 = .13, ICC2 = .84).

Further, following Marsh et al.'s (2012) recommendation, we conducted multilevel confirmatory factor analyses (ML-CFA) for all the structural models tested in the study to check whether the a priori factor model held at both L1 and L2. Traditional cutoff criteria indicative respectively of excellent and adequate fit to the data were used: (i) CFI (comparative fit index) and TLI (Tucker–Lewis index) $\geq .95$ and $\geq .90$; (ii) RMSEA (root mean square error of approximation) $\leq .06$ and $\leq .08$. Model fit indices demonstrated that they provided very good fit to the data: enjoyment (peer, student) and appraisal (control/value) model (CFI = .96/97, TLI = .96/.96, and RMSEA = .26/.25), anxiety (peer, student) and appraisal (control/value) model (CFI = .97/97, TLI = .97/.96, and RMSEA = .24/.26), boredom (peer, student) and appraisal (control/value) model (CFI = .96/96, TLI = .95/.95, and RMSEA = .26/.26).

Finally, based on parameters obtained from the above ML-CFA models, we computed McDonald's (1970) omega (ω) to estimate the reliability of different latent constructs at level 1 and level 2. Compared with traditional scale score reliability estimates (e.g., alpha), ω has the advantage of taking into account the strength of association between items and constructs as well as item specific measurement errors and to be applicable to the estimates obtained at both L1 and L2 based on level-specific variance-covariance matrices (Morin et al., 2014; Sijtsma, 2009). Ω coefficients are interpreted as any other composite reliability coefficients (above .70 indicates sufficient). These indices were fully satisfactory for enjoyment (ω = .84/.92 at L1/L2), anxiety (ω = .79/.93), boredom (ω = .80/.96), perceived control (ω = .88/.97), perceived value (ω = .75/.96), perceived peer enjoyment (ω = .86/.98), perceived peer anxiety (ω = .83/.95) and perceived peer boredom (ω = .81/.96). It should be noted that these coefficients operated independently at L1 and L2, and the reliability were substantially higher at L2. In other words, when estimating L2 constructs, doubly latent models partialed out the unreliability of agreement between students forming each class and the class aggregated ratings of these latent variables were more reliable than individual ratings.

4.5 Results

Preliminary Analyses

Table 1 displays the descriptive statistics for each of the variables in the study. The scores of all variables except for previous English achievement (negatively skewed) were normally distributed and there were sufficient variations within each variable as indexed by their standard deviation and range. Students generally experienced more enjoyment than anxiety or boredom in their English class. Multiple group mean comparison showed that the differences between each pair of the three emotions were significant ([$F(2, 10{,}917) = 2348.86$, $p < 0.01$]). Similar differences also applied when comparing students' perceptions of peer enjoyment,

anxiety and boredom ([F(2, 10,885) = 2581.71, p < 0.01]). Moreover, students tended to assign a relatively high value to learning English but reported only a moderate level of control over the subject (t[1, 7277] = 34.93, p < .01).

Table 1
Descriptive Statistics for the Study Variables

Variable	*M*	*SD*	Range	Skewness
Student enjoyment	3.57	.91	5-25	-.24
Student anxiety	2.70	1.00	5-25	.14
Student boredom	2.04	.94	5-25	.74
Control appraisal	3.03	1.08	6-30	-.09
Value appraisal	3.82	.85	6-30	-.88
Perceived peer enjoyment	3.62	.95	5-25	-.25
Perceived peer anxiety	2.56	.97	5-25	.27
Perceived peer boredom	2.03	.84	5-25	.83
Gender	.46	.50	0-1	.17
Grade	7.87	.89	7-9	-.03
Performance	93.06	20.53	1-120	-1.315

Note. Gender was coded as 1 = female, 0 = male. Grade was coded as 7, 8, 9 for respective grade.

Table 2 presents the Pearson product–moment correlations between study variables at both individual and classroom levels. Students' enjoyment, anxiety and boredom were positively linked with corresponding perceptions of peer enjoyment, anxiety and boredom. Both control appraisal and value appraisal were positively related to student and perceived peer enjoyment, but were negatively related to student and perceived peer anxiety and boredom. Student and perceived peer enjoyment were negatively related to student and perceived peer anxiety and boredom. All the directions of correlations were the same and ranged from moderate to strong across the two levels. These correlations provided preliminary evidence supporting the hypothesized relationships among perceived peer emotions, appraisals and student emotions in the study. The results also confirmed the appropriateness of control variables that were significantly (weakly for gender and performance but moderately for grade) related to perceived peer emotions, control-value appraisals and student emotions.

Table 2
Manifest Correlations Among the Study Variables at two Levels

Variable	1	2	3	4	5	6	7	8	9	10
1 Student enjoyment	—	Level 1: Students (N = 3643)								
2 Student anxiety	-.42	—								
3 Student boredom	-.53	.41	—							
4 Control appraisal	.55	-.45	-.38	—						
5 Value appraisal	.46	-.25	-.42	.41	—					
6 Perceived peer enjoyment	.59	-.33	-.42	.40	.39	—				
7 Perceived peer anxiety	-.37	.54	.33	-.35	-.23	-.45	—			
8 Perceived peer boredom	-.38	.28	.55	-.24	-.30	-.53	.49	—		
9 Performance	.33	-.17	-.18	.28	.15	.11	-.12	-.08	—	
10 Gender	.14	-.05	-.14	.17	.16	.08	.05	-.05	-.05	—
1 Student enjoyment	—	Level 2: Classrooms (N = 103)								
2 Student anxiety	-.34	—								
3 Student boredom	-.55	.56	—							
4 Control appraisal	.74	-.26	-.46	—						
5 Value appraisal	.58	-.20	-.31	.59	—					
6 Perceived peer enjoyment	.80	-.29	-.44	.66	.52	—				
7 Perceived peer anxiety	-.52	.58	.46	-.52	-.32	-.48	—			
8 Perceived peer boredom	-.71	.34	.50	-.68	-.55	-.75	.57	—		
9 Performance	.20	.00	.04	.17	.15	.18	-.18	-.23	—	
10 Grade	-.55	.07	.45	-.61	-.36	-.46	.27	.39	-.05	—

Note. $p < .05$ for $|r| > .04$ at individual level; $p < .05$ for $|r| > .19$ at classroom level.

ML-SEM Analyses

To test Hypothesis 1 that perceived peer enjoyment, anxiety and boredom would have a positive influence on students' corresponding enjoyment, anxiety and boredom, we regressed student emotions on corresponding perceived peer emotions at the individual level and at the classroom level in three separate models. Effects at the two levels were estimated simultaneously. Results from multilevel structural equation modelling showed that there was a significant positive main effect of perceived peer enjoyment on student enjoyment at both individual (ß = .68, $p < .01$) and class levels (ß = .73, $p < .01$) after controlling for all covariates. Similarly, perceived peer anxiety was a significant positive predictor of student

anxiety (individual/classroom; ß = .65, $p < .01$/ß = .71, $p < .01$) and perceived peer boredom was a significant positive predictor of student boredom (individual/classroom; ß = .64, $p < .01$/ß = .44, $p < .01$) across the two levels. Thus, all measured peer emotions were positively associated with the corresponding student emotions, as predicted.

In a next step, we separately added perceived control and perceived value to both the individual and the classroom levels of each model to test the associations between perceived peer emotions and control-value appraisals (Hypothesis 2). At the individual student level, perceived peer enjoyment positively predicted control appraisal (ß = .45, $p < .01$) and value appraisal (ß = .55, $p < .01$). In contrast, perceived peer anxiety and perceived peer boredom negatively predicted both appraisals of control (anxiety/boredom; ß = -.40, $p < .01$/ß = -.24, $p < .01$) and value (anxiety/boredom; ß = -.25, $p < .01$/ß = -.45, $p < .01$). There were also corresponding effects at the classroom level. Perceived peer enjoyment was again a significant positive predictor of control appraisal (ß = .50, $p < .01$) and value appraisal (ß = .66, $p < .01$), and perceived peer anxiety and perceived peer boredom were again both significant negative predictors of control (anxiety/boredom; ß = -.41, $p < .01$/ß = -.53, $p < .01$) and value (anxiety/boredom; ß = -.27, $p < .05$/ß = -.46, $p < .01$) appraisals. Thus, peer emotions influenced student appraisals as predicted at both levels.

In the third step, we explored the relationship between perceived peer emotions and student emotions in more detail by testing Hypothesis 3, which predicted that this relationship should be mediated by control and value appraisals but remain significant after controlling for these mediators. Each student emotion was regressed on control appraisal and value appraisal separately in the above six models. The goodness of fit indices for the final ML-SEM models are reported in Table 3. As can be seen, the inspected ranges of fit indices demonstrate that these models have a good fit to the data.

Table 3
Fit Indices for Multilevel SEM Models

	Control Appraisal					Value Appraisal				
Model	$\chi 2$	*df*	CFI	TLI	RMSEA	$\chi 2$	*df*	CFI	TLI	RMSEA
Enjoyment	827.76	235	.96	.95	.027	735.61	239	.96	.96	.025
Anxiety	772.20	238	.97	.96	.025	745.58	239	.97	.96	.025
Boredom	852.55	234	.95	.95	.027	796.48	236	.96	.95	.026

Note. Each emotion indicates the model linking respective perceived peer emotion, control/value appraisals and students' corresponding emotion. $\chi 2$ = chi square test of model fit; df = degree of freedom; CFI = comparative Fit Index; TLI = Tucker-Lewis index; RMSEA = root mean square error of approximation.
$p < .01$ for all $\chi 2$ in the six models.

Finally, Table 4 presents all the unstandardized and standardized path coefficients obtained from these final models. At the individual level, control appraisal had a significant positive effect on student enjoyment but a significant negative effect on student anxiety and boredom when controlling for corresponding perceptions of peer enjoyment, anxiety and boredom. Moreover, the influences of perceived peer enjoyment, anxiety and boredom on students' corresponding enjoyment, anxiety and boredom were reduced but still significant when control appraisal was added to each model as another predictor of students' emotions. Mediation analyses further confirmed that the indirect effects of perceived peer emotions on students' corresponding emotions through control appraisal were significant for enjoyment (Sobel's z = 3.64, $p < .01$), anxiety (z = 4.41, $p < .01$) and boredom (z = 5.08, $p < .01$). Similarly, value appraisal was a significant positive predictor of student enjoyment but a significant negative predictor of student anxiety and boredom after controlling for corresponding perceived peer emotions. The effects of perceived peer enjoyment, anxiety and boredom on students' corresponding enjoyment, anxiety and boredom remained significant after controlling for the influence of value appraisal. The mediating effects of value appraisal in the relationship between perceived peer emotions and corresponding students' emotions were significant for

enjoyment (z = 3.55, $p < 0.01$), anxiety (z = 2.77, $p < .01$) and boredom (z = 4.59, $p < .01$).

Table 4
Main Effects from the Final Multilevel SEM Models Presented in Figure 1

	Control Appraisal		Value Appraisal	
	Est. (S.E.)	**Std. (S.E.)**	**Est. (S.E.)**	**Std. (S.E.)**
L1 effects				
Peer Enjoyment →Appraisal	.46 (.07)**	.45 (.06)**	.62 (.08)**	.55 (.07)**
Appraisal →Student Enjoyment	.35 (.08)**	.39 (.08)**	.36 (.09)**	.43 (.11)**
Peer Enjoyment →Student Enjoyment	.48 (.09)**	.51 (.08)**	.41 (.11)**	.44 (.11)**
Peer Anxiety →Appraisal	-.46 (.06)**	-.40 (.04)**	-.22 (.04)**	-.25 (.04)**
Appraisal →Student Anxiety	-.27 (.05)**	-.35 (.06)**	-.16 (.05)**	-.16 (.05)**
Peer Anxiety →Student Anxiety	.44 (.06)**	.51 (.05)**	.54 (.07)**	.62 (.05)**
Peer Boredom →Appraisal	-.34 (.04)**	-.28 (.03)**	-.52 (.07)**	-.45 (.05)**
Appraisal →Student Boredom	-.19 (.03)**	-.24 (.04)**	-.35 (.06)**	-.42 (.07)**
Peer Boredom →Student Boredom	.53 (.04)**	.57 (.03)**	.43 (.06)**	.44 (.06)**
L2 effects				
Peer Enjoyment →Appraisal	.42 (.09)**	.14 (.09)**	.70 (.12)**	.21 (.03)**
Appraisal →Student Enjoyment	-.08 (.11)	-.03 (.02)	-.06 (.10)	-.02 (.02)
Peer Enjoyment →Student Enjoyment	.58 (.16)**	.21 (.14)**	.46 (.18)**	.17 (.06)**
Peer Anxiety →Appraisal	-.52 (.11)**	-.13 (.03)**	-.46 (.12)**	-.13 (.06)*
Appraisal →Student Anxiety	.25 (.11)*	.07 (.03)*	.13 (.06) †	.07 (.04) †
Peer Anxiety →Student Anxiety	.59 (.13)**	.21 (.04)**	.58 (.12)**	.18 (.04)**
Peer Boredom →Appraisal	-.43 (.08)**	-.15 (.03)**	-.67 (.22)**	-.21 (.07)**
Appraisal →Student Boredom	.13 (.21)	.03 (.05)	.36 (.09)**	.18 (.05)**
Peer Boredom →Student Boredom	.53 (.17)**	.21 (.07)**	.54 (.13)**	.21 (.06)**

Note. At the classroom level, the arrows from peer emotions to appraisals and student emotions indicate climate effects. The arrows from appraisals to student emotions indicate contextual effects.
†$p < .10$. *$p < .05$. **$p < .01$.

At the classroom level, the effects of control appraisal on students' emotions were reduced to non-significant for enjoyment and boredom but became significantly positive for anxiety when taking account of the contextual nature of this relationship and controlling for the influence of corresponding perceived peer emotions. The effects of perceived peer enjoyment,

anxiety and boredom on students' corresponding enjoyment, anxiety and boredom were diminished but still significant after controlling for control appraisal. The only possible mediation effects of control in the relationship between perceived peer anxiety and student anxiety were significant ($z = -2.05$, $p < .05$). On the other hand, value appraisal was no longer a significant predictor of enjoyment and anxiety but became a significant positive predictor of boredom when taking into account the contextual effects and controlling for corresponding perceived peer emotions. The influences of perceived peer enjoyment, anxiety and boredom on students' corresponding enjoyment, anxiety and boredom were lessened but remained significant after controlling for value appraisal. Mediation analyses showed that the indirect effects of perceived peer boredom on student boredom through value appraisal were significant ($z = -2.42$, $p < .05$).

4.6 Discussion

The present study showed that students' perceptions of peer enjoyment, anxiety and boredom were positively linked with their own enjoyment, anxiety and boredom in language classes, even when controlling for students' gender, grade, and previous English achievement. This is in line with social-cognitive learning theory's (Bandura, 1977; Pekrun, 2000) assumption that the ongoing social interactions between peers and students in the classroom are likely to influence students' cognition, emotions and behaviors. It also supports an overall emotion transfer from peers to students (Elfenbein, 2014). Moreover, this relationship was found to be robust across student and class levels. This confirms the appropriateness of treating perceived peer emotions as classroom climate constructs as well as individual-specific characteristics.

Consistent with our hypotheses, we found that control and value appraisals partially mediated the relationships between perceived peer enjoyment, anxiety and boredom and

students' corresponding emotions. However, due to the contextual effects of appraisals on achievement emotions, control-value appraisals had differential effects on students' enjoyment, anxiety and boredom at the individual level and at the classroom level. Specifically, at the personal level, both control and value appraisals had positive effects on students' enjoyment but negative impacts on students' anxiety and boredom. The partial mediating effects of either control appraisal or value appraisal in the relationships between perceived peer emotions and students' corresponding emotions were all positively significant. This is in line with both the emotion contagion and the social appraisal accounts of interpersonal affect transfer (Hatfield, Cacioppo, & Rapson, 1994; Parkinson & Manstead, 2015) as well as the mediation assumption posited by the control-value theory of achievement emotion (Pekrun, 2006). When a student senses his/her peers' academic emotions on an individual basis, higher perceived peer enjoyment and lower perceived peer anxiety and boredom have positive influences on the student's control and value appraisals, which result in higher levels of student enjoyment and lower levels of student anxiety and boredom. One possible interpretation is that students may infer their peers' control and value appraisals from their perceived emotions and these individually inferred appraisals in turn affect their own appraisals and emotions (Hareli, 2014; Pekrun & Perry, 2014).

At the classroom level, control appraisal had positive effects on students' anxiety while value appraisal had positive effects on students' boredom. The class-level positive effects of appraisals on negative achievement emotions are in accordance with the afore-mentioned "big-fish-little-pond effect" (Marsh et al., 2008), which has been replicated by many studies in educational psychology (Arens, Morin, & Watermann, 2015; Frenzel et al., 2007b; Zeidner & Schleyer, 1998). This indicates that the higher the class' average competence over the English subject, the higher the students' anxiety toward language learning after controlling for individual self-concept. Similarly, the higher the class's average value toward the English

language, the higher students' boredom for the learning activity after controlling for individual value. One explanation for these findings may be that they reflect the current middle-school education in China, which overemphasizes the competitiveness and attainment value of high-stake exams which eventually lead students to lose intrinsic motivation and feel nervous and bored about academic study. High class-average competence and value may also correspond to higher achievement demands in the respective class and probably also to higher pacing (Frenzel et al., 2007b), which in turn seems to positively influence students' experience of anxiety and boredom of English in that class. This seems to be also supported by the nearly significant positive effects of the class's mean score of value on students' anxiety. Importantly, the present study extends previous findings by showing that the emotion contagion and the social appraisal processes may not only operate at the personal level but also at the collective level. However, the mediation effects of social appraisal located mainly at the individual level in the present data. Moreover, the present research also contributes to existing literature by demonstrating that control and value appraisals have reverse effects on students' achievement emotions at the class level as compared with those at the individual level.

Overall, our data demonstrated that perceived peer enjoyment had positive influences on students' control-value appraisals and own enjoyment at individual and class levels while the opposite trend was observed for perceived peer anxiety and boredom. This implies that peers do make a difference in terms of students' emotional experiences in the classroom and they may also affect how students' achievement emotions change across time. Moreover, the significant mediated effects of perceived peer emotions on students' corresponding emotions through appraisals add to the literature on peer and student affect transfer and provide evidence regarding potential underlying processes. Specifically, peer emotions may impact students' emotions either directly through automatic contagion (Hatfield, Cacioppo, & Rapson, 1994; Neumann & Strack, 2000) or indirectly through influencing their control and value appraisals

(Manstead & Fischer, 2001; Parkinson & Simons, 2009; Pekrun, 2006), which in turn lead to different levels of emotional experiences.

Changing Students' Outcomes by Changing the Collective Peer Emotions

Students' academic emotions and performance are often attributed to personal factors such as learning strategies, motivation, appraisals, and goal orientations etc (Goetz et al., 2007; Masgoret & Gardner, 2003; Pekrun et al., 2009; Skehan, 1991). Although emotions and achievement can be attributed to a great extent to individual differences, more and more researchers attribute student emotions and academic performance at least in part to classroom environment such as student-teacher relationship, peer support and classroom climate (Arens, Morin, & Watermann, 2015; Brackett et al., 2011; Howes, 2000; Wentzel, 1998). The findings from the current study demonstrated that positive peer emotions have the potential to improve students' control-value appraisals and emotions at the level of the classroom as a whole, thus resulting in improvements for individual students within each class. This suggests that student interventions can target the emotional climate of the whole class. For example, teachers can create a positive emotional atmosphere for learning by demonstrating that the classroom is a valuable place to be and are enthusiastic about learning (Jennings & Greenberg, 2009). Teachers should not only be effective at helping students solve academic problems but also be highly aware of and responsive to students' social and emotional needs. Moreover, teachers can nurture positive peer emotions by promoting cooperative learning in and out of the classroom (Gillies, 2004). When students work together toward the same learning goals, they start to build mutual support and responsibility with peers, and eventually develop a form of positive interdependence in which the success of one student depends upon the success of all other students (Johnson & Johnson, 2009). Such a classroom is characterized by a sense of connectedness and belongingness, enjoyment and enthusiasm, and respect. As a result, students

feel more cheerful and competent in learning, and become more successful academically (Reyes et al., 2012).

Chinese EFL (English as a Foreign Language) teachers, in particular, can adopt a mastery goal orientation in the classroom despite the competitive nature of high-stake exams. On the one hand, this can reduce the tense of competition among peers and offset the negative impact of norm referenced exams in which only a few students can excel academically. On the other hand, a mastery classroom environment is conducive to the formation of intrinsic motivation and positive peer relationships and has been shown to be positively predictive of students' academic self-efficacy, engagement and achievement at both classroom and individual levels (Morin et al., 2014; Lam et al., 2015). Another way to achieve a positive classroom climate is through teachers' active cultivation of a sense of humor and a friendly and cooperative environment that can encourage students to collaboratively take risks in speaking the language (Shao, Yu, & Ji, 2013). For instance, teachers can devise and deploy various emotional buffers, among them role play, games, drama, responding to literature, and group discussion, where all are intended to make learning tasks more interesting and less intimidating (Shao, Yu, & Ji, 2012). When all the students become less anxious and more assured in English classes, everyone's language learning is likely to be accelerated.

Limitations and Future Directions

Some limitations in the present study may be noted and used to suggest directions for future research. First, the predictive design of peer emotions on students' appraisals and emotions we used in the present study is limited due to the synchronous assessment of the study variables at one time point. While the proposed effects of peer emotions on students' control-value appraisals and corresponding emotions are theoretically plausible and supported by the current data, the reverse order of effects is also conceivable. For example, students' enjoyment or

boredom for an English lesson may influence their peers' emotions about the course either directly through automatic contagion or indirectly through social appraisal (Hatfield, Cacioppo, & Rapson, 1994; Parkinson & Manstead, 2015). This may in a sense also be supported by the present findings since every student is a peer of all other students. Thus, it would be interesting for future research to use repeated measures to address potential reciprocal effects between peer emotions, student appraisals and emotions (Pekrun et al., 2014).

Second, as all variables of the present study were assessed by self-report questionnaires which are susceptible to response bias, the predictive effects found in the present study may be inflated by common method variance (Donaldson et al., 2000). Although self-ratings have the unique advantage of being accessible to internal feelings and thoughts, the subjective nature of this measure is often difficult to control. Future research should also include objective measures such as implicit measures of emotions, EEG or fMRI to assess appraisals and emotions. For instance, researchers may use video observation to record students' emotions in class and match the transcribed data with other instruments to analyze the proposed hypotheses (Reyes et al., 2012). Researchers may also ask teachers or parents to report students' appraisals and emotions as an alternative approach of assessment.

Third, the present study used a rather molar approach for assessing relationships between peer and student emotions, which were both assessed in a trait-like manner with regards to a year-long English class. A trait-like assessment is meaningful as it captures the overall emotional tone in classrooms. Nevertheless, it cannot embrace micro-processes that likely are at work in interpersonal transmission of emotions. Studies using a more fine-grained experience sampling approach addressing appraisals and emotions in a specific lesson or a period of time (e.g. before an exam) could be designed to further explore the underlying emotion contagion and social appraisal processes between peer and student affect transfer (for a study assessing day-to-day student appraisals and emotional experiences, see Goetz et al., 2010).

Fourth, the value appraisal scale employed in this study is an overall measure containing three dimensions: intrinsic, utility and attainment values (Pekrun & Meier, 2011). For intrinsic and utility values, they are assumed to be positive or unrelated to positive achievement emotions (opposite for negative emotions), but the relations between negative attainment value and positive achievement emotions are assumed to be negative (Ahmed et al., 2010; Bieg et al., 2013; Pekrun et al. 2007). This may also be a possible explanation for the non-significant effects of value appraisal on students' enjoyment at the class level, where potential positive and negative effects counterbalanced each other. Therefore, future research might do well to use separate components of the value scale to more precisely examine the mediating effects of value in the relationship between peer and student emotions.

Conclusion

The findings of the present study indicate that peer emotions and student emotions in English classrooms are closely linked by ways of emotion contagion and social appraisal. Insights into such processes underlying affective interaction between peers and students are of crucial importance since emotionally positive classrooms are likely successful classrooms. We have shown that when a classroom is characterized by more peer enjoyment and less anxiety and boredom, students feel more in control and appreciate more of the learning subject, which should result in better engagement and performance (Pekrun et al., 2011). This suggests that academic success, to some extent, is contingent upon the emotional components of the learning environment. Thus, enhancing pleasant emotions and moderating unpleasant emotions at the classroom level should be an important goal of instruction for teachers and educators (Pekrun & Perry, 2014; Reyes et al., 2012). Classrooms filled with enjoyment of learning likely provide optimal grounds for meeting challenges and promoting development and achievement.

Chapter 5. General Discussion

The objective of this thesis was to conduct a systematic investigation on some assumptions posited by the control-value framework of achievement emotions in the domain of second language learning. To this end, one distal antecedent, namely, perceived peer emotion and two proximal antecedents i.e. control and value appraisals together with eight achievement emotions and L2 motivation and performance were examined in three empirical studies.

5.1 Summary of Findings and Discussion

In study 1, the learning-related Achievement Emotion Questionnaire (AEQ; Pekrun et al., 2011) measuring eight discrete emotions (enjoyment, pride, hope, anger, boredom, anxiety, hopelessness and shame) before, during and after studying was adapted to the second language context. The psychometric properties of the new scale were tested by examining its reliability, internal validity and external validity across two samples of 1021 Chinese freshmen.
The good reliability and structural validity confirm that the AEQ is a reliable and valid instrument which can be used to assess students' various emotions, including, but not limited to, emotions experienced in second language learning. This is helped by the design of the items which do not contain any specific and temporal references. The goodness of fit of the hierarchical models obtained from single-group and measurement invariance tests corroborates Pekrun et al.'s (2002; 2011) proposition that researchers should consider the affective, cognitive, physiological and motivational components for all discrete emotions. Similarly, when examining the model fit for the whole scale of the AEQ, it is best to take into account both the differences between discrete emotions and the differences between different components that comprise each emotion scale. Accordingly, innovative language researchers may well consider the component structure of different emotions and combine it with the

special features of different aspects of language skills (listening, speaking, reading, and writing) when trying to design emotion scales that tailor to second language learning.

Moreover, the moderate to strong correlations among different emotions underscore the distinctiveness of each emotion and the usefulness of treating them uniquely in academic context. In particular, second language researchers now may move beyond the well-research language anxiety to study a broader range of emotions experienced in language learning. For example, applied linguists can now test how various emotions other than anxiety influence individual factors in language learning such as motivation, learning strategies, learning styles, and willingness to communicate (Dörnyei, 2003; MacIntyre, 2007; Oxford, 1993) across cultures (individual vs. collective) and languages (Spanish, Arabic, Japanese etc).

Further, the positive relations between positive activating emotions (enjoyment, hope, and pride) and L2 motivation and performance and the converse relationships for negative deactivating emotions (hopelessness and boredom) corroborates that positive activating emotions are likely beneficial for students' engagement and learning, whereas negative deactivating emotions are likely detrimental, as posited by the cognitive-motivational model of emotion effects (Pekrun et al., 2006). As for the zero correlations between negative activating emotions (anger, anxiety, and shame) and extrinsic motivation, this is in line with previous findings (Ahmed et al., 2010; Lane et al., 2005) and the control-value theory's proposition that negative activating emotions can exert variable effects on students' learning (Pekrun et al., 2011). The extrinsically motivated short-term effort stimulated by these emotions may be counterbalanced by the intrinsically motivated long-term effort, thus leading to the null correlations. Overall, these findings support L2 scholars' assertion regarding the fundamental importance of diverse emotions for students' motivation and learning (MacIntyre, 2002; Scovel 2000; Swain 2013).

In study 2, I examined the relationships between control-value appraisals, achievement emotions and language performance. Both independent and interactive effects of control and value on achievement emotions and L2 performance as well as the conditional indirect effects of appraisals on achievement through emotions were tested longitudinally among 550 Chinese college students across one semester.

The correlations between appraisals, emotions and L2 performance indicate that students experienced more positive emotions and less negative emotions when they felt confident about language learning and found the learning activities and outcomes important and interesting. These students were also more likely to achieve a better performance in the language exam. These results are in line with both the control-value theory and recent research findings (Lee, 2014).

The interactive effects of control and value appraisals on achievement emotions imply that students' perception of control may exert greater influence on their pleasant emotions in learning activities which were more valued by them. Students' perception of control may affect their unpleasant feelings more strongly in academic activities or outcomes which were highly valued by them. These interactive effects are in support of the control-value theory's assumptions regarding the multiplicative impact of control and value appraisals on academic emotions.

In addition, the interactive effects of control and value appraisals on language performance indicate that students' perceived control may have more impact on L2 performance among those who attached more subjective value to language learning. Alternatively, it could also suggest that students' perceived value may have more influence on L2 performance among those who afforded greater personal control on language acquisition. This finding provides empirical support for the extension of the control-value theory regarding the interactive effects of appraisals on achievement.

Finally, the conditional indirect effects of the four emotions in the relationships between control-value interactions and L2 performance imply that students' perception of control may exert a continually stronger influence on emotions and increase with students' beliefs about the value of language learning, and these more joyful, hopeful, and proud and less hopeless emotions in turn lead them to achieve a better score in the exam. The mediation effects are in line with recent research (Peixoto et al., 2016; Luo et al., 2016) as well as the cognitive-mediational model of achievement emotions (Pekrun, 2006) that emphasizes the mediating role of emotions between cognitive appraisals and academic achievement. More importantly, the moderated mediation effects in the present findings can be seen as evidence of integrating the multiplicative impact of control-value appraisals into the mediational framework of achievement emotions and thus extends our knowledge on the interplay between emotions and their appraisal antecedents and learning outcomes. As for anger, boredom, anxiety and shame, the non-significant indirect effects may be due to the fact that the influence of these emotions on L2 achievement were relatively weak in the present study, therefore, their effects on L2 performance were masked by those of control and value.

In study 3, I explored the connections between peer emotions, control-value appraisals and student emotions in English classes. Multilevel structural equation modeling was conducted on data collected from 3643 Chinese middle-school students in 103 classrooms. The significant positive relations between perceived peer emotions and student corresponding emotions indicate that the ongoing social interactions between peers and students in the classroom are likely to bear influence on students' cognition, emotions and behaviors (Bandura, 1977; Pekrun, 2000). The perceptions of peer emotions may directly affect students' own emotions, supporting an overall emotion transfer from peers to students (Elfenbein, 2014). Moreover, these relationships were of similar magnitude across student and class levels, which confirmed

the appropriateness of treating perceived peer emotions as both classroom climate constructs and individual-specific characteristics.

Furthermore, the partial mediation effects of control and value appraisals between perceived peer emotions and student emotions at the individual level imply that when students sense their peers' academic emotions on an individual basis, higher perceived peer enjoyment and lower perceived peer anxiety and boredom have positive influences on the student's control and value appraisals, which resulted in higher levels of student enjoyment and lower levels of student anxiety and boredom. It may also be interpreted as high perceived peer enjoyment and low perceived peer anxiety and boredom convey both a high control and a high positive value over the activities and outcomes in English study on the part of the peer, which, in turn, influenced students' corresponding appraisals and emotions in that domain (Hareli, 2014; Pekrun & Perry, 2014). This result lends support to both the emotion contagion and the social appraisal accounts of interpersonal affect transfer (Hatfield, Cacioppo, & Rapson, 1994; Parkinson & Manstead, 2015) as well as the mediation assumption posited by the control-value theory of achievement emotion (Pekrun, 2006).

At the classroom level, the partial mediating effects of control between perceived peer anxiety and student anxiety and value between perceived peer boredom and student boredom can be best explained by the "big-fish-little-pond effect" (Marsh et al., 2008). Specifically, this indicates that high class-average competence over the English subject can lead students to feel anxious about language learning. Similarly, high class-average attainment value toward the English language may lead to students becoming bored with a learning activity. These findings may in a sense reflect the current middle-school education in China, which overemphasizes the competitiveness and attainment value of high-stake exams which eventually lead students to lose intrinsic motivation and feel nervous and bored about academic study. High class-average competence and value may correspond to higher achievement demands in the respective class

and probably also to higher pacing (Frenzel et al., 2007b), which in turn seems to positively influence students' experience of anxiety and boredom in that English class. Such an interpretation seems to be also supported by the nearly significant positive effects of the class' average value on students' anxiety. Importantly, the present findings extend previous research by showing that the processes of emotion contagion and social appraisal may not only operate at the personal level but also at the collective level. It also contributes to existing literature by demonstrating that control and value appraisals have reverse effects on students' achievement emotions at the class level as compared with those at the individual level.

5.2 Theoretical and Practical Implications

The present research found that students experience diverse emotions in second language learning. However, it also raises the question whether these emotions (e.g. type, frequency and intensities) are the same for different aspects of language acquisition. Research in foreign language anxiety has shown that students' experiences of anxiety differ markedly in speaking, reading, listening and writing (Cheng, Horwitz, & Schallert, 1999; Elkhafaifi, 2005; Saito, Horwitz, & Garza, 1999). We may extrapolate that this phenomenon applies to other emotions as well. Accordingly, the control-value framework of achievement emotions may consider to include the dimension-specific feature of different subjects into the principle of domain-specificity. For example, it is expected that to the extent students' perceived control and academic value for theoretical physics and applied physics differ, their emotional experiences for these two aspects of learning may also have noticeable differences.

Moreover, the moderated mediation effects of control and value appraisals on language performance through achievement emotions suggest that the control-value theory may explicitly integrate the multiplicative impact of appraisals on emotions into the cognitive-mediational model of achievement emotions as well as depict other potential conditional

indirect effects between distal antecedents (individual, e.g., goal structures, trait emotions; situational, e.g., task features, teacher support), appraisals, achievement emotions, and academic outcomes in the framework. To be sure, each of the above assumptions has already been mentioned separately in the theory, the combination of these propositions may nonetheless bring new dynamics to the model.

Lastly, findings of the study showed that peer emotions had significant influences on students' emotions and appraisals. The control-value theory has rightly pointed out the importance of teacher emotions on students' achievement emotions, however, the impact of peer emotions has not received as much attentions. Given that peer emotions may exert profound impact on students' appraisals and emotions, both at the individual and at the classroom level, it might be judicious to acknowledge the influence of peer emotions in the theory. Moreover, other aspects of the peer such as peer support and peer relationships (Dijkstra & Veenstra, 2011; Wentzel, 1998) are also important classroom elements which are worth of mentioning in the framework.

The present findings have several pedagogical implications for language educators. First, the present studies showed that a number of different emotions are of critical importance to students' engagement and language learning. By implication, L2 teachers are advised to heed a broad variety of students' emotions including, but also beyond, the well-researched emotion anxiety. For example, teachers can use innovative instruction techniques to stimulate students' interests and expectations for the class so as to foster a positive emotional experience for their language learning (Rouhani, 2008; Shao, Yu, & Ji, 2012).

Second, our data suggests that control and value appraisals have independent effects on students' emotions and L2 performance. Accordingly, L2 intervention designers may consider incorporating language classes with the current control retraining program (e.g. problem-oriented coping strategies, goal-oriented training methods) to promote L2 achievement both

directly through enhancing perceptions of control and indirectly through cultivating positive emotions and reducing negative emotions (Hall et al., 2006; Seligman & Csikszentmihalyi, 2000). Moreover, material developers should pay attention to resources that bear personal relevance and interests to students (Rouhani, 2008). For example, using major-tailored language textbooks or authentic language training tasks may contribute significantly to more positive experience and engagement in their students (Ellis, 2003).

Third, the interactive effects of control and value further imply that the most effective way to foster emotional experience and L2 development would involve programs that promote both appraisal constructs. For example, personal value-based writing programs aiming at enhancing emotional health and L2 performance (McCullough, Root, & Cohen, 2006; Shao, Yu, & Ji, 2012) may be incorporated into existing attributional retraining programs that encourage greater perceived control (Hall et al., 2007). Alternatively, the effectiveness of control-enhancing programs on emotions and achievement may be more readily observed in situations of greater personal value to students (such as major courses vs. selective courses).

Finally, findings from the present research demonstrated that positive peer emotions have the potential to improve students' control-value appraisals and emotions at the level of the classroom as a whole, thus resulting in improvements for individual students within each class. This suggests that student interventions can target the emotional climate of the whole class. For example, teachers can create a positive emotional atmosphere for learning by demonstrating that the classroom is a valuable place to be and are enthusiastic about learning (Jennings & Greenberg, 2009). Teachers can also nurture positive emotions among peers by promoting cooperative learning in and out of the classroom (Gillies, 2004). Chinese EFL teachers can adopt a mastery goal orientation in the classroom to foster intrinsic motivation and positive peer relationships and offset the negative impact of exam-related peer competition. Another way to achieve a positive classroom climate is through teachers' active cultivation of a sense of

humor and a friendly and cooperative environment that can encourage students to collaboratively take risks in speaking the language (Shao, Yu, & Ji, 2013). When students' "affective filter" (Krashen, 1980) is down, they become less anxious and more confident in English classes, and their language learning is likely to be accelerated.

5.3 Limitations and Future Directions

Some limitations in the present research should be noted and may be used to suggest directions for future research. First, most variables in the three studies were assessed by self-report questionnaires which are susceptible to response bias. Thus, the correlations and predictive effects found in the present research may be inflated by common method variance (Donaldson et al., 2000). Future research should also include objective measures such as implicit measures of emotions, EEG or fMRI to assess appraisals and emotions. Researchers may also use video observation to record students' emotions in class and match the transcribed data with other instruments to analyze the proposed hypotheses (Reyes et al., 2012). Teacher or parent reports are also alternative options for assessing students' appraisals and emotions.

Second, the present research employed a predictive design to test the influence of peer emotions and control-value appraisals on achievement emotions or language outcomes. However, the data structure in these studies was correlational by nature thus precluding casual conclusions. As acknowledged by the control-value theory (Pekrun et al., 2007), achievement activities and outcomes normally acted back on emotions and appraisals, and emotions and appraisals can also shape the academic environment. For example, students' previous achievement can affect their subsequent emotions and academic self-concept for the learning subject (Peixoto et al., 2016; Pekrun et al., 2011). These emotions and appraisals may in turn influence their peers' and teachers' emotions in the classroom. As such, future research might

do well to address the reciprocal links between peer emotions, appraisals, achievement emotions and performance.

Third, the present research used a rather molar approach for assessing relationships between peer emotions, control-value appraisals, student emotions and English performance. A trait-like assessment is meaningful as it captures the overall emotional tone in classrooms. However, it cannot embrace micro-processes that likely are at work in interpersonal transmission of appraisals and emotions. Studies using a more fine-grained experience sampling approach addressing appraisals and emotions in a specific lesson or a period of time (e.g. before an exam) could be designed to further explore the underlying processes linking appraisals and emotional experiences between teachers, peers and students in and out of classes.

Fourth, the present study assessed students' course-specific appraisals and emotions in relation to their general language ability. However, different aspects of language acquisition may stimulate different levels of appraisals and emotions (Arens & Jansen, 2016; Horwitz, Horwitz, & Cope, 1986). For example, Chinese students reported having less control and more worry about their speaking ability compared with other language skills, due to the limited exposure to authentic communication (Shao, Yu, & Ji, 2013). Future studies could examine how students' appraisals and emotional experiences differ with respect to each language dimension so that recommendations can be made to tailor to their special language needs.

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Appendices

Study 1

Achievement Emotion Questionnaire (Learning-related)

学习情绪问卷（学习相关量表）

General Information

The items of this questionnaire pertain to 8 different learning-related emotion scales and to 4 different emotion component subscales within emotions (affective, cognitive, motivational, and physiological component subscales as indicated by the 3rd letter ("A", "C", "M", or "P") within item labels). In the questionnaire, items are presented systematically in three blocks pertaining to emotional feelings experienced before, during, and after studying (indicated by the last letter ("B", "D", or "A") within items labels). Items are mixed within blocks.

Instruction

Studying for your course exam at university can induce different feelings. This questionnaire refers to emotions you may experience when preparing for this English exam. Before answering the questions, please recall some typical situations of studying which you have experienced during the course of your studies. Then, write a corresponding number in each blank.

准备大学课程考试时会产生不同的情绪。本问卷是关于你在复习这门综合英语考试时可能会感受到的情绪。回答前，请回忆你在学习过程中经历过的一些典型情况。之后在空格处填上相应的数字。

Before Studying
The following questions pertain to feelings you may experience **BEFORE** studying for this exam. Please indicate how you feel, typically, before you begin to study.

学习前
下列问题是关于你在复习这门考试之前可能会感受到的情绪。请注明你在学习前的通常感受。

During Studying
The following questions pertain to feelings you may experience **DURING** studying for this exam. Please indicate how you feel, typically, during studying.

学习中
下列问题是关于你在复习这门考试之中可能会感受到的情绪。请注明你在学习中的通常感受。

After Studying
The following questions pertain to feelings you may experience **AFTER** having studied for this exam. Please indicate how you feel, typically, after having studied.

学习后
下列问题是关于你在复习这门考试之后可能会感受到的情绪。请注明你在学习后的通常感受。

ENJOYMENT

JOA1B I look forward to studying.
我期盼学习。

JOA2D I enjoy the challenge of learning the material.
我喜欢学习材料带来的挑战。

JOA3D I enjoy acquiring new knowledge.
我喜欢学习新知识。

JOC1D I enjoy dealing with the course material.
我喜欢处理课程材料。

JOC2A Reflecting on my progress in coursework makes me happy.
反思自己在课业上取得的进步让我感到高兴。

JOM1D I study more than required because I enjoy it so much.
因为我很喜欢学习，我会学习要求以外的东西。

JOM2A I am so happy about the progress I made that I am motivated to continue studying.
我对自己取得的进步感到很高兴，以至于还想继续学习。

JOM3A Certain subjects are so enjoyable that I am motivated to do extra readings about them.
某些话题是如此有趣，我很有动力做些课外阅读。

JOP1D When my studies are going well, it gives me a rush.
学习顺利时，我会突然感到欣喜若狂。

JOP2D I get physically excited when my studies are going well.
学习进展顺利时，我浑身起劲。

HOPE

HOA1B I have an optimistic view toward studying.
我对学习持乐观态度。

HOA2D I feel confident when studying.
学习时我很自信。

HOC1B I feel confident that I will be able to master the material.
我相信自己能掌握学习资料。

HOC2B I feel optimistic that I will make good progress at studying.
我乐观地感到自己能在学习上取得很好的进步。

HOM1D The thought of achieving my learning objectives inspires me.
一想到要达成学习目标，我就倍受鼓舞。

HOM2D My sense of confidence motivates me.
我的信心让我干劲十足。

PRIDE

PRA1A I'm proud of myself.
我为自己而自豪。

PRC1D I'm proud that even difficult material does not pose many problems for me.
我很自豪自己能处理甚至很难的学习资料。

PRC2A I think I can be proud of my accomplishments at studying.
我认为我可以为自己的学习成就感到自豪。

PRM1D Because I want to be proud of my accomplishments, I am very motivated.
因为想为自己的学习成就而自豪，我很有动力。

PRM2A I am so proud of myself that I would rather continue to study than do anything else.
因为对近期的进步感到自豪，我还有动力学习更多的东西。

PRP1D When I solve a difficult problem in my studying, my heart beats with pride.
解决了一道学习难题时，我的心充满了激动的自豪。
PRP2D When I excel at my work, I swell with pride.
学习优异时，我充满了自豪。

ANGER

AGA1B I get angry when I have to study.
不得不学习时，我会生气。
AGA2D I get angry while studying.
学习时我会气恼。
AGC1B I'm annoyed that I have to study so much.
要学习这么多的东西让我感到烦躁。
AGC2D I get annoyed about having to study.
不得不学习让我感到恼火。
AGM1B Because I get so upset over the amount of material, I don't even want to begin studying.
因为对如此多的学习材料感到心烦，我甚至不想开始学习。
AGM2D I get so angry I feel like throwing the textbook out of the window.
我很生气，想把课本扔出窗外。
AGP1D When I sit at my desk for a long time, my irritation makes me restless.
长时间坐在书桌前时，我会感到烦躁不安。
AGP2A After extended studying, I'm so angry that I get tense.
长时间学习后，我因生气而神经紧张。

BOREDOM

BOA1D The material bores me to death.
学习材料烦死我了。
BOA2D Studying for my courses bores me.
学习这门课让我感到厌倦。
BOC1D While studying this boring material, I spend my time thinking of how time stands still.
学习这些无聊的材料时，我在想时间为何过得如此缓慢。
BOC2D The material is so boring that I find myself daydreaming.
学习材料太枯燥了，我发现自己在做白日梦。
BOM1B Because I'm bored I have no desire to learn.
我因为感到厌倦，所以没有学习欲望。
BOM2B I would rather put off this boring work till tomorrow.
我宁愿把这份无聊的功课推迟到明天去做。
BOP1D The material bores me so much that I feel depleted.
学习材料太枯燥了，我感到精疲力竭。
BOP2D While studying I seem to drift off because it's so boring.
因为太无聊，学习时我似乎在瞌睡。

ANXIETY

AXA1D I get tense and nervous while studying.
学习时我感到紧张。
AXA2A When I can't keep up with my studies it makes me fearful.
学习跟不上时，我会感到害怕。
AXC1D I worry whether I'm able to cope with all my work.

我担心是否能应付所有的学习任务。

AXC2D The subject scares me since I don't fully understand it.
我感到害怕，因为不能完全理解这门课。

AXM1B I get so nervous that I don't even want to begin to study.
我很紧张，甚至不想开始学习。

AXM2D While studying I feel like distracting myself in order to reduce my anxiety.
学习时，我想要通过分散注意力来减少焦虑。

AXP1D As time runs out my heart begins to race.
随着时间的流逝，我开始感到不安。

AXP2D Worry about not completing the material makes me sweat.
担心完不成学习材料让我冒汗。

HOPELESS

HLA1B I feel hopeless when I think about studying.
一想到学习时，我就感到无助。

HLA2D I feel helpless.
我感到无助。

HLC1D I'm resigned to the fact that I don't have the capacity to master this material.
我感到听天由命，认为自己无法掌握这些学习材料。

HLC4A I'm discouraged about the fact that I'll never learn the material.
我为自己永远无法学会这些材料感到心灰意冷。

HLM2D I feel so helpless that I can't give my studies my full efforts.
我感到很无助，以至于无法全力以赴去学习。

HLM3D I wish I could quit because I can't cope with it.
真想放弃学习，因为我无法应付。

HLP1B My lack of confidence makes me exhausted before I even start.
缺乏信心让我在开始学习之前就感到精疲力竭。

HLP2D My hopelessness undermines all my energy.
我的无助削弱了我的所有精力。

SHAME

SHA1D I feel ashamed.
我感到羞愧。

SHC4D I feel ashamed because I am not as adept as others in studying.
我感到羞愧，因为不如其它同学会学习。

SHC6D I feel embarrassed about not being able to fully explain the material to others.
无法透彻地向同学解释学习资料让我感到尴尬。

SHC8A My memory gaps embarrass me.
我的记忆力差让我感到尴尬。

SHM2A Because I have had so much troubles with the course material, I avoid discussing it.
因为在学习课程材料时遇到太多困难，我避免讨论它。

SHM3A I don't want anybody to know when I haven't been able to understand something.
还没能理解一些内容时，我不想让任何人知道。

SHP1D When somebody notices how little I understand I avoid eye contact.
有人注意到我知之甚少时，我会避免目光接触。

SHP2D I turn red when I don't know the answer to a question relating to the course material.
不知道与课程材料有关的问题答案时，我会感到脸红。

Motivation Scales

学习动机量表

The following questions ask about your motivation for studying **this English exam**. Write a corresponding number in each blank. Remember there are no right or wrong answers, just answer as honestly as possible.

下列问题涉及你在复习**这门英语考试**时的学习动机。请在空格处填上相应的数字。回答无对错之分，请诚恳作答。

Intrinsic Goal Orientation
内在学习目标倾向

1. In this class, I prefer course material that really challenges me so I can learn new things.
   在这门课中，我更喜欢具有真正挑战性的课程材料，这样我可以学到新东西。
2. In this class, I prefer course material that arouses my curiosity, even if it is difficult to learn.
   在这门课中，我更喜欢能激发我好奇心的课程材料，即使它们学起来很难。
3. The most satisfying thing for me in this class is trying to understand the content as thoroughly as possible.
   在这门课中，最让我满意的事情是尽可能透彻地理解学习内容。
4. When I have the opportunity, I choose course assignments that I can learn from even if they don't guarantee a good grade.
   如果有机会，我会选择能学到东西的课程作业，即使不能确保好的分数。

Extrinsic Goal Orientation
外在学习目标倾向

1. Getting a good grade in this class is the most satisfying thing for me right now.
   在这门课中取得好的分数是让我现在最满意的事情。
2. The most important thing for me right now is improving my grade in this class.
   我目前的首要事情是提高这门课的考试成绩。
3. If I can, I want to get better grades in this class than most of the other students.
   如果可能，我希望在这门课中得到比大多数其他同学更高的分数。
4. I want to perform well in this class because it is important to show my ability to my family, friends, or teachers.
   我希望在这门课考试中考得出色，因为向家人、朋友或老师展示我的能力是重要的。

Self-regulated Learning
学习自我管理

1. When studying, I set my own goals which I want to achieve.
   学习时我为自己设定想要达到的目标。
2. When working on difficult material, I do have some strategies which I can use.
   处理较难的学习材料时，我确有一些学习策略可用。
3. I am good at assessing and controlling the effectiveness of my studying.
   我善于评估和掌控自己的学习效率。
4. I am good at assessing my ability to master the material.
   我善于评估自己掌握学习材料的能力。

Study 2

Control and Value Beliefs

控制与价值信念

The following questions ask about your beliefs and attitudes while studying for **this English exam**. Write a corresponding number in each blank. There are no right or wrong responses, please just answer candidly.

下列问题是关于你在复习**这门英语考试**时的信念和态度。请在空格处填上相应的数字。回答无对错之分，请坦率作答。

Perceived Academic Control
学习控制能力感知

1. I have a great deal of control over my academic performance in this English exam.
   我对这门英语课的考试成绩有很强的控制能力。
2. The more effort I put into my preparation, the better I do in the exam.
   我准备的越充分，在这门课的考试中做得就越好。
3. I lack control on how well I do in this English exam.
   我对这门英语课的考试成绩缺乏控制能力。
4. No matter how hard I work, I can't seem to do well in the exam.
   无论多努力，我似乎也无法在这门课的考试中取得好成绩。

Self-efficacy for Learning and Performance
学习自我效能

1. I believe I will receive excellent grades in my English exam.
   我相信我能在这门英语考试中取得优异的成绩。
2. I am confident I can do an excellent job on the test.
   我相信我会在这门课的考试中表现得很出色。
3. I expect to do well in the exam.
   我预期自己在这门课的考试中做得很棒。
4. I am certain I can master the knowledge and skills tested in this English exam.
   我确信自己能掌握这门英语考试所考察的知识和技能。

Task Value
学习价值

1. In general, I find learning for this exam very interesting.
   总体而言，我觉得复习这门课考试很有趣。
2. It is very important to me to get good grades in this English exam.
   在这门英语考试中取得好成绩对我很重要。
3. In general, I think studying for this exam is useful.
   总体而言，我认为准备这门课考试很有用。
4. If I have a poor grade in this English exam, I will be very disappointed.
   如果这门英语课考得不好，我会很沮丧。
5. I like reading the test materials.
   我喜欢阅读这门课的考试材料。

6. Compared to my other activities, learning for this exam is very useful for me.
   与我的其他活动相比，准备这门考试对我很有用。
7. It is very important to me not to get poor grades in this English exam.
   不在这门英语考试中考得糟糕对我很重要。
8. If I have a good grade in this English exam, I will be very satisfied.
   如果这门英语课考得好，我会很满足。

Achievement Emotion Questionnaire (Learning-related)

(Same as above)

Study 3

Perceived Peer Emotions

同学情绪感知

The following questions ask your perceptions of **your classmates'** emotions in **this English class** during **recent two weeks**. There are no right or wrong answers. Please write a corresponding number to indicate how you perceive their feelings.

下列问题涉及你对**你们班同学最近两周上这门英语课时**的情绪的感知。回答无对错之分。请用相应的数字表明你对他们情绪的感知。

Enjoyment:

1. My classmates enjoy being in this English class.
   我们班同学喜欢上这门英语课。
2. My classmates' enjoyment of this English class makes them want to participate.
   从这门英语课中得到的乐趣让我们班同学很愿意参与它。
3. My classmates get excited about listening to the English teacher in this class.
   能听英语老师讲这门课让我们班同学十分兴奋。
4. My classmates enjoy participating this English class so much that they get energized.
   我们班同学很喜欢上这门英语课，因此他们在课堂上很活跃。
5. My classmates are looking forward to learning a lot in this English class.
   我们班同学期待从这门英语课中学到很多东西。

Anxiety:

1. My classmates feel nervous in this English class.
   我们班同学在上这门英语课时会感到紧张。
2. My classmates get scared that they might say something wrong in this English class.
   我们班同学害怕上英语课时会答错问题。
3. My classmates get tense when communicating with the teacher in English.
   在课堂上与老师用英语对话时，我们班同学感到紧张。
4. My classmates worry whether they may be called upon by the English teacher to answer questions they don't understand.
   我们班同学担心英语老师会叫他们回答不懂的问题。
5. My classmates get nervous about speaking English in front of other students.
   在其他同学面前说英语让我们班同学感到紧张。

Boredom:

1. My classmates get bored in this English class.
   我们班同学上这门英语课时会感到厌倦。
2. My classmates find this English class fairly dull.
   我们班同学觉得这门英语课很无聊。
3. My classmates feel so bored that they can't wait for this English class to end.
   在这门英语课上，我们班同学感到十分厌倦，迫不及待等着下课。
4. My classmates get so bored by this English class that their mind begin to wonder.
   在这门英语课上，我们班同学由于感到厌倦而在思想上开小差。
5. My classmates think about what else they might be doing rather than sitting in this boring English class.
   我们班同学在想还能做些什么其他的事情，而不是坐在这无聊的英语课上。

Control-Value Appraisals

控制-价值评估

The following questions pertain to your beliefs and attitudes in **English** during **recent two weeks**. There are no right or wrong answers, please be open and honest.

下列问题涉及你在**最近两周**对学习**英语**的信念和态度。回答无对错之分，请坦诚作答。

Academic Self-Concept in English
英语学习自我概念

1. English is one of my best subjects.
   英语是我最擅长的科目之一。
2. I get good marks in English.
   我的英语考试分数好。
3. Work in English is easy for me.
   学习英语对我来说比较简单。
4. I have always done well in English.
   我英语学得一直很好。
5. I do badly in tests of English.
   我的英语考试分数差。
6. I learn things quickly in English classes.
   我在英语课上学东西很快。

Academic Value in English
英语学习价值

1. I find learning English is very interesting.
   我觉得学习英语很有趣。
2. It is important to me to get good grades in English.
   在英语考试中取得好的分数对我很重要。
3. I think learning English is very useful for me.
   我认为学习英语很有用。

4. I like reading English texts.
   我喜欢阅读英语课本。
5. It is important to me not to get bad grades in English.
   在英语考试中不能考得糟糕对我很重要。
6. Learning more about English is useful for my life.
   学习更多的英语对我的生活很有用。

Student Classroom Achievement Emotions

学生课堂学习情绪

The following questions pertain to emotions you may experience in **this English class** during **recent two weeks**. There are no right or wrong answers, please write a corresponding number to indicate how you feel in this class.

下列问题涉及你在**最近两周上这门英语课时**可能会感受到的情绪。回答无对错之分。请在空格处用相应的数字表明你在上这门英语课时的感受。

Enjoyment:

1. I enjoy being in this English class.
   我喜欢上这门英语课。
2. My enjoyment of this English class makes me want to participate.
   从这门英语课中得到的乐趣让我很愿意参与它。
3. It's so exciting that I could sit in this class for hours listening to the English teacher.
   能听英语老师讲这门课让我十分兴奋。
4. I enjoy participating so much that I get energized.
   我很喜欢上这门英语课，因此我在课堂上很活跃。
5. I am looking forward to learning a lot in this English class.
   我期待从这门英语课中学到很多东西。

Anxiety:

1. I feel nervous in this English class.
   我在上这门英语课时会感到紧张。
2. I get scared that I might say something wrong in this English class.
   我害怕上英语课时会答错问题。
3. I get tense when communicating with the teacher in English.
   在课堂上与老师用英语对话时，我感到紧张。
4. I worry whether I may be called upon by my English teacher to answer questions I don't understand.
   我担心英语老师会叫我回答不懂的问题。
6. I get nervous about speaking English in front of other students.
   在其他同学面前说英语让我感到紧张。

Boredom:

1. I get bored in this English class.
   我上这门英语课时会感到厌倦。
2. I find this English class fairly dull.
   我觉得这门英语课很无聊。
3. I feel so bored that I can’t wait for this English class to end.
   在这门英语课上，我感到十分厌倦，迫不及待等着下课。
4. Because I get bored, my mind begins to wonder.
   在这门英语课上，我因感到厌倦而在思想上开小差。
5. I think about what else I might be doing rather than sitting in this boring English class.
   我在想还能做些什么其他的事情，而不是坐在这无聊的英语课上。