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Accepted for publication in the International Journal of Applied Linguistics

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<https://doi.org/10.1111/ijal.70194>

**Unpacking the Complex Mechanisms of Teacher-to-Student Emotion Transmission in
Foreign Language Classrooms: A Mixed-Methods Study**

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Citation for this article:

Jiang, A. L., Shao, K., Kutuk, G., Parkinson, B., & Pekrun, R. (in press). Unpacking the complex mechanisms of teacher-to-student emotion transmission in foreign language classrooms: a mixed-methods study. *International Journal of Applied Linguistics*.

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Abstract

Drawing on emotion contagion and social appraisal theories of interpersonal emotion transmission and the control-value theory of achievement emotions, this mixed-method study explored how foreign language students' perceptions of teacher emotions transferred to their own emotions in classroom settings. We collected data using self-report questionnaires completed by 408 middle school students, along with semi-structured interviews of 12 additional participants. Quantitative results revealed that students' perceptions of teacher enjoyment and anxiety were positively associated with their own corresponding emotions. Appraisals of control and value collectively and partially mediated the association between perceived teacher enjoyment and student enjoyment whereas only control appraisal mediated the association between perceived teacher anxiety and student anxiety. Qualitative findings supported quantitative results and further illuminated the role of emotion contagion and social appraisal in teacher-to-student emotion transfer. However, interview data also revealed instances where students responded to teacher emotions with non-congruent emotions. Implications for innovative foreign language pedagogy are also discussed.

Keywords: teacher, student, emotion transmission, foreign language, mixed-methods

Note: The first two authors contributed equally to this article and their order was determined at random: Both should thus be considered first authors.

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本研究基于人际情绪传递的情绪感染与社会评价理论以及学业情绪的控制-价值理论，采用混合研究方法，探讨了课堂情境中外语学习者对教师情绪的感知如何传递为自身情绪。我们通过自陈式问卷收集了 408 名中学生的数据，并对另外 12 名参与者进行了半结构式访谈。量化研究结果表明，学生对教师愉悦情绪和焦虑情绪的感知与其自身相应情绪呈显著正相关。控制评价与价值评价在“感知教师愉悦—学生愉悦”关系中发挥了共同且部分中介作用；而在“感知教师焦虑—学生焦虑”关系中，仅控制评价发挥了中介作用。质性研究结果支持量化发现，并进一步阐释了情绪感染与社会评价在教师情绪向学生情绪传递过程中的作用。然而，访谈数据也显示，在某些情况下，学生会对教师情绪作出不一致的情绪反应。最后，本文还讨论了研究结果对外语教学实践创新的启示。

1. Introduction

Emotions play a central role in foreign language (FL) learning and teaching (Derakhshan & Pawlak, 2025; Richards, 2022). A substantial body of research has highlighted the significant relevance of emotions to both teachers and students in educational settings. For teachers, emotions influence professional identity, instructional quality, and psychological well-being (Burić & Frenzel, 2023; Gkonou & Miller, 2021; Zhang et al., 2023). For students, emotional experiences shape learning engagement, cognitive processing, motivation, and academic achievement (Burić & Frenzel, 2021; Derakhshan & Yin, 2024; Shao et al., 2020). Despite this growing body of literature, most studies have focused mainly on the intrapersonal functions of emotions, leaving the interpersonal dimensions of emotions relatively underexplored (Shao & Parkinson, 2024). Given the inherently interactive nature of FL classrooms, where teachers play a pivotal role in encouraging student engagement and motivation, it is imperative to elucidate the emotional interactions that unfold between teachers and students within these micro-contexts. Understanding the pathways through which teacher emotions influence students' feelings can yield vital insights into how FL teachers regulate both their own and their students' emotional experiences, thereby cultivating emotionally supportive and conducive learning environments.

Emotion contagion and social appraisal offer a valuable lens for conceptualizing interpersonal emotion transmission (Parkinson, 2020). According to the theory of primitive emotion contagion, individuals may automatically mimic then internalize their social partners' emotions (Hatfield et al., 1994). By contrast, social appraisal posits that the impact of others' emotions on our own emotions depends on our interpretation of their meaning (Parkinson, 2011). Complementing these perspectives, the control-value theory (CVT; Pekrun, 2006, 2024) of achievement emotions asserts that contextual features of the classroom such as teachers, students and teaching characteristics can affect students'

emotions both directly and indirectly through their control and value appraisals of academic activities, which function as proximal antecedents of achievement emotions.

Integrating these theoretical paradigms, it is plausible to hypothesize that teacher-to-student emotion transmission operates through both direct contagion effects, where students' emotional states align with those of their teachers, and indirect appraisal-mediated pathways, whereby students' control and value appraisals mediate this emotional influence. However, empirical investigations testing these integrated mechanisms, particularly within language education settings, remain scarce. Furthermore, the existing studies have predominantly adopted quantitative approaches (e.g., Frenzel et al., 2018; Moskowitz & Dewaele, 2021), which, while beneficial for hypothesis testing across large samples, may be insufficient to capture the nuanced, contextually embedded emotional exchanges inherent in classroom interactions. Qualitative approaches, by contrast, provide richer insights into the subtle and complex meanings underlying interpersonal emotional processes. Consequently, a mixed-methods design that synergizes the strengths of both approaches is warranted to fully apprehend the multifaceted nature of teacher-to-student emotion transmission (Shao et al., 2025). Addressing these theoretical and methodological lacunae, a mixed methods approach was used in the present study to investigate the dynamics of teacher-to-student emotional transmission in FL classrooms. Anchored in an integrative theoretical model combining emotion contagion, social appraisal, and control-value theories, this research seeks to furnish a comprehensive and contextual-sensitive understanding of how emotions transfer from teachers to students in FL education, with the aim of informing pedagogical practices that foster emotionally responsive and effective language learning environments.

2. Literature Review

2.1 Emotion contagion and social appraisal in interpersonal emotion transfer

Emotion contagion and social appraisal are two key social psychological theories that explain interpersonal emotion transfer (Parkinson, 2011). According to emotion contagion, individuals automatically mimic each other's emotional reactions (e.g., facial expressions,

bodily movements and non-verbal cues), and the interoceptive feedback from these mirrored responses can lead to congruent emotions (Hatfield et al., 1994). For instance, at a celebratory event where people express joy and enthusiasm, an initially neutral observer may unconsciously pick up on the positive atmosphere and start feeling happy even without fully knowing the reason for the celebration. In contrast, social appraisal theory proposes that the influence of others' emotions on one's own emotional state depends on the interpretations and inferences made about the meaning and significance of their emotional expressions (Parkinson, 2011). This implies that social appraisals may potentially act as mediators in interpersonal affect transfer (Parkinson, 2020). For instance, seeing a companion react anxiously to an event may trigger anxiety in ourselves as their response suggests potential risks. Extensive research in social psychology provides empirical evidence supporting these assumptions in interpersonal emotional interactions. Among these, Deng and Hu's (2018) experimental study demonstrated the direct, mimicry-based transmission of happiness among participants, which is consistent with emotion contagion. As for social appraisal, Parkinson and Simons (2009) conducted a diary study showing that participants' anxiety about upcoming decisions was influenced by their perception of their close partners' anxiety. This effect was partially mediated by appraisals of potential risk and value of the event.

In FL contexts, emotion contagion and social appraisal may similarly influence the emotional dynamics between teachers and students (see Parkinson & Manstead, 2015). For instance, students might feel enthusiastic when they see their teacher energetically introducing a FL learning task even without considering the underlying reasons for the teacher's enjoyment (i.e., contagion). Perceived teacher enjoyment may also influence

students' appraisal of the task's importance or boost their confidence in successfully completing it, which in turn, enhances their learning enjoyment (i.e., appraisal). Conversely, students may immediately feel anxious upon observing their teacher's anxious feelings. This display of anxiety can signal potential negative consequences, such as fear of making mistakes in public speaking, and may diminish students' confidence and motivation in tasks like oral presentations. This, in turn, may increase their overall language learning anxiety. These assumptions align with the control-value theory (CVT) of achievement emotions, which suggests that the classroom environment affects students' academic emotions by shaping how they perceive their control over learning and the importance they assign to academic tasks (Pekrun, 2006).

2.2 Control-value theory of achievement emotions and teacher-student emotion transmission

Contemporary psychological theories regard appraisals as primary antecedents of human emotions (Scherer, 2001). Among these, control-value theory (CVT) proposes that students' perceptions of the control and value assigned to academic activities and outcomes act as proximal determinants of their achievement-related emotions (Pekrun, 2006). Perceived control refers to the extent to which individuals believe they can influence their learning activities or outcomes. Perceived value refers to the subjective importance that individuals attach to these activities and outcomes. Different combinations of control and value elicit distinct achievement emotions (Pekrun, 2024). For instance, high control and high value appraisals lead to enjoyment as students feel confident in successfully completing an assignment that matters to them. Conversely, low control and high value can trigger anxiety,

particularly when students anticipate failure in an important exam. Within the CVT, Pekrun et al. (2023) classified achievement emotions (e.g., enjoyment, hope, pride, anxiety, anger, shame, hopelessness, and boredom) into a three-dimensional taxonomy based on valence (positive or negative), activation (activating or deactivating), and object focus (prospective, concurrent or retrospective). This study focuses on the two emotions which are most frequently reported by teachers and students in educational settings: the positive activating emotion of enjoyment and the negative activating emotion of anxiety (Frenzel et al, 2016; Pan & Zhang, 2023).

Furthermore, CVT posits that social environmental factors may either affect achievement emotions directly or indirectly via control and value appraisals (Pekrun, 2006). In the FL context, teacher emotions are often seen as an important constituent of the classroom environment that provide relevant signals of students' competence and the importance of the learning activities (Frenzel et al., 2021; Zhang et al., 2023). It therefore seems plausible that teachers' emotions may influence students' emotions either directly as a consequence of emotion contagion (Hatfield et al., 1994) or indirectly by influencing students' appraisals of control and value ascribed to learning activities and outcomes (Pekrun, 2006). The way appraisals mediate emotions aligns with social appraisal theory, which highlights how people interpret and absorb emotional cues from others to shape their own understanding of a situation (Parkinson, 2020). Currently, there is a dearth of empirical research examining associations between students' perceptions of teacher emotions and their own achievement-related appraisals and emotions in language classes.

2.3 Studies of teacher-student emotion transmission in academic settings

While research on the relations between teacher and student emotions is limited, existing studies can be broadly categorized into two strands. The first focuses on the direct transfer of emotional experiences between teachers and students grounded in the concept of emotion contagion. For instance, using multi-camera classroom observations, Frenzel et al. (2024) found that the facial expression of joy was reciprocally transmitted between teachers and students. In the FL context, Talebzadeh et al. (2020) investigated the dynamics and mechanics of teacher-student enjoyment transmission in the FL class using an idiodynamic method. Their findings suggest that the transfer of enjoyment from teacher to students mainly depends on an automatic process of mimicry-based emotion contagion. The second strand of research has documented indirect teacher-student emotion transmission, which is mediated by teacher characteristics, student engagement, and instructional behaviors. For example, Fenzel et al.'s (2018) study showed that the association between teacher enjoyment and student enjoyment at different time points was mediated either by students' perceptions of teacher enthusiasm or by teachers' perceptions of student engagement. Similarly, Becker et al. (2014) documented that the link between teacher and student enjoyment was partially mediated by teachers' instructional behaviors.

Although these studies offer valuable insights into the relationship between teacher and student emotions, they have both theoretical and methodological limitations that warrant further investigation. Theoretically, the first strand of inquiry focused exclusively on emotion contagion, neglecting the role of social appraisal. While the second strand of research extended this perspective and considered teachers' and students' behaviors as mediators, it did not examine how teacher emotions influence students' control and value appraisals, as

proposed by both social appraisal theory and CVT. However, emotion contagion and social appraisal are expected to operate in tandem in interpersonal affect transfer, with the latter potentially playing a more significant role (Parkinson, 2020).

Methodologically, existing research has predominantly employed quantitative approaches to test the transmission of congruent emotions. While these approaches allow for rigorous testing of theory-driven hypotheses, they also constrain complex research phenomena into fixed, measurable constructs, potentially overlooking context-specific dynamics that emerge only through interpretive, meaning-centered inquiry (Creswell & Clark, 2017). In interpersonal affect transfer, it is noteworthy that social appraisal does not always result in congruent emotional responses. There are various social-cognitive factors (e.g., field of dependence, social comparison, teacher expectancy) which may influence this process and potentially lead to the transmission of non-congruent emotions between social partners (Diel et al., 2021; Parkinson, 2020). This phenomenon further highlights the need to combine quantitative and qualitative methods to provide a more balanced view on teacher-student dynamic emotional interactions in FL classrooms.

2.4 The present study

To address the research gaps outlined above, the present study represents the first empirical effort to adopt a mixed-methods design for examining teacher-to-student emotion transmission within the secondary education context in China. Integrating both quantitative and qualitative approaches, this study addresses the following specific questions:

- RQ1:** What are the relationships between students' perceptions of teacher enjoyment and anxiety and their own control and value appraisals, as well as their corresponding emotional experiences, in FL classrooms?
- RQ2:** Are the relationships between perceived teacher enjoyment and anxiety and students' corresponding emotions mediated by control and value appraisals (social appraisal) but still significant after controlling for the influence of appraisals (emotion contagion)?
- RQ3:** How do students describe the process of emotion contagion during teacher-to-student emotion transmission in FL classrooms?
- RQ4:** How do students describe the process of social appraisal during teacher-to-student emotion transmission in FL classrooms?

3. Methodology

3.1 Participants

The quantitative phase of the study was conducted with 408 students studying in 12 classrooms from grade 7th to 9th (age: $M = 13.81$ years, $SD = 1.14$; gender: 204 female, 202 male, 2 unspecified), all attending a middle school located in a southeastern city in China. The school's admission policy, which enrolls both rural and urban students, ensured a broad representation of participants' socio-economic background. Students attended four English classes per week, with each section lasting 90 minutes, following a teacher-centered pedagogical approach. The curriculum emphasized the development of English listening, speaking, reading, and writing skills. Over the course of three academic years, students were expected to acquire a vocabulary range of 1,500 to 2,000 words.

For the qualitative phase, participants were recruited via random stratified sampling from two public middle schools in a northeastern city in China. These schools were purposefully selected to ensure students' demographic and educational backgrounds were comparable to those of the quantitative sample. A total of 132 seventh to ninth grade students (age: $M = 13.22$ years, $SD = 1.12$) completed the Achievement Emotions Questionnaire-Second Language Learning (Shao et al., 2023b), which assessed their FL emotions, specifically, enjoyment and anxiety. Based on their self-reported responses, students were categorized across three emotional intensity levels: high, medium, and low. Students were categorized into six subgroups based on the type and intensity of their reported emotions. From each subgroup, two students were randomly selected for interviews, resulting a final sample of 12 interviewees (7 female, 5 male). All participants across both research phases were fully informed about the purpose of the study and told that participation was voluntary. Informed consent was obtained in writing, and anonymity was guaranteed to protect participants' identities. The research was granted ethical approval by the first author's university ethics review committee prior to data collection.

3.2 Procedure

Quantitative data were gathered using a self-report questionnaire designed to assess all target variables, as well as relevant demographic information. To ensure linguistic and conceptual equivalence, all scales used in this study were independently translated from English to Chinese (see Supplementary Materials) by an educational psychologist and a bilingual professor fluent in both languages. Following this, two bilingual doctoral students specializing in educational psychology conducted a blind back-translation into English. A

translation expert subsequently reviewed both language versions to refine item wording and resolve discrepancies, thereby ensuring optimal semantic and conceptual alignment between the English and Chinese versions. All items were rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Individual semi-structured interviews were used to collect the qualitative data. The first author conducted an audio-recorded interview, each lasting for approximately 30 minutes, in Mandarin—the participants’ native language—to facilitate rich, authentic responses. The interview protocol included three main parts: First, participants were invited to describe specific classroom scenarios and observable behaviors associated with their teacher’s expressions of enjoyment and anxiety, along with their own emotional reactions. Second, they were asked to offer interpretations regarding the possible causes or underlying meanings of their teacher’s emotions. Third, students reflected on how their teacher’s emotional expressions influenced their own perceptions of control and value, as well as their subsequent emotional experiences. The complete interview guide is provided in the supplementary materials.

3.3 Instruments

Perceived teacher emotions. Student-perceived FL teacher enjoyment and anxiety were measured using two four-item scales adapted from Frenzel et al.’s (2016) Teacher Emotions Scale. The item wordings were adapted to fit the EFL classroom context. Following Marsh et al.’s (2012) recommendation, our questionnaire used a uniform stem ‘My English teacher . . .’ for measuring each item (e.g., Enjoyment: ‘My English teacher enjoys teaching in general.’);

Anxiety: 'My English teacher feels nervous while teaching our class.'). The scores were summed to form the perceived teacher emotion indices (enjoyment $\alpha = .84$, anxiety $\alpha = .78$).

Control and value appraisals. Students' perceived control and perceived value towards FL learning were measured by two five-item scales adapted from Shao et al. (2023a). The perceived control scale assessed students' self-concept in English (e.g., 'I have always done well in English'), while the perceived value scale captured students' intrinsic interest in English learning (e.g., 'I find learning English is very interesting') in the domain of English learning. One item in each scale was negatively worded, and its score was reverse-coded. The scores from each five-item scale were then summed to generate the control-value appraisal indices (control $\alpha = .82$, value $\alpha = .79$).

Achievement emotions. We assessed students' achievement emotions using the course-related emotion scales of Pekrun et al.'s (2011) Achievement Emotion Questionnaire (AEQ). We adapted the instructions from the original AEQ to fit the context of English classroom learning. Respondents were asked to indicate how they felt during English classes. Each emotion was evaluated using five items including enjoyment (e.g., 'I enjoy participating in this English class so much that I get energized'), anxiety (e.g., 'I get scared that I might say something wrong in this English class'). The scores for each five-item scale were aggregated to calculate the FL emotion indices (enjoyment $\alpha = .85$, anxiety $\alpha = .83$).

3.4 Data analysis

Quantitative data was analyzed using *Mplus* (Version 8.0). Missing data were handled by implementing full information maximum likelihood (FIML) estimation. To address potential non-normal distribution of data, the robust maximum likelihood (MLR) estimator was

applied. As participants in our study were nested within teachers (with students at Level 1 nested in teachers at Level 2), we used the ‘type = complex’ command in *Mplus* to take into account this nested data structure. Moreover, analyses of intraclass correlation coefficients (ICC) for all variables were relatively low, ranging from .03 to .07. This not only demonstrated that the standard errors at Level 2 were low in the present data but also lent support to our approach of focusing on differences between students at Level 1 (Marsh et al., 2012). Prior to the main analyses, all scale scores were standardized to minimize non-essential multicollinearity and to facilitate comparison of coefficients. Descriptive statistics, including means, standard deviations, and reliability coefficients, were computed using SPSS Version 26. The construct validity of all scales was examined through confirmatory factor analysis (CFA), using the following cutoff criteria indicative of excellent and adequate fit to the data, respectively: (1) CFI (comparative fit index) and TLI (Tucker–Lewis index) $\geq .95$ and $\geq .90$; (2) RMSEA (root mean square error of approximation) $\leq .06$ and $\leq .08$; (3) SRMR (standardized root mean square residual) $\leq .08$ and $\leq .10$ (Byrne, 2011).

Qualitative data were transcribed verbatim and analyzed using *NVivo* 13, guided by Braun and Clarke’s (2006) six-phase thematic analysis framework. This process involved: (1) familiarization with the data, (2) generation of initial codes, (3) searching for themes, (4) reviewing themes, (5) defining and naming themes, and (6) producing the final report. A mixed deductive–inductive approach (Creswell & Clark, 2017) was employed. In the deductive phase, drawing on theories of emotional contagion, social appraisal, and control-value theory, the first two authors developed an initial coding framework to identify patterns related to two hypothesized mechanisms of emotion transmission: (1) direct emotional

contagion from teacher to student, and (2) indirect transfer via students' social appraisal of the teacher's emotions. The inductive phase entailed a more open-ended exploration of the data to identify emergent patterns and themes, allowing for a more comprehensive understanding of how FL emotions were transmitted from teachers to students. Data analysis was iterative, with the two coders continuously revisiting both the theoretical constructs and the evolving codes and themes. Inter-rater reliability was initially established at 89%. Any discrepancies were resolved collaboratively through discussion, re-analysis, and theoretical alignment. To enhance the credibility and trustworthiness of the findings, member checking was conducted by sharing the emergent themes with participants, who confirmed the accuracy and resonance of the interpretations with their lived experiences.

4. Findings

4.1 Factor loadings and measurement model fit

As demonstrated in Table 1, results showed that all items loaded above .40 on the relevant factors, except for one item from the value appraisal scale. Model fit indices indicated that most scales had good fit to the data (except that RMSEA was reasonable for value appraisal and student enjoyment). Finally, the two structural equation models (SEM) representing FL enjoyment and anxiety transmission from teacher to students, respectively, fitted the data very well.

Table 1. Confirmatory factor analyses: Factor loadings and fit indices.

	λ	χ^2 (df)	CFI	TLI	RMSEA	SRMR
Perceived teacher enjoyment	.66-.77	16.88 (5)	.99	.97	.064	.023
Perceived teacher anxiety	.54-.71	8.25 (5)	.99	.98	.040	.022
Control appraisal	.62-.70	11.96 (9)	.99	.98	.033	.020

Value appraisal	.38-.82	17.33 (9)	.99	.95	.070	.044
Student enjoyment	.61-.79	13.83 (5)	.99	.97	.078	.018
Student anxiety	.67-.76	12.93 (5)	.99	.97	.062	.020
<i>Structural models</i>						
Enjoyment	.38-.87	312.67(203)	.96	.96	.037	.041
Anxiety	.39-.88	274.77(203)	.97	.97	.030	.048

Note. Factor loadings (λ) are standardized coefficients. All factor loadings and χ^2 values are significant at $p < .01$.

4.2 Associations between perceived teacher emotions, students' appraisals, and students' emotions in EFL classrooms (RQ1)

Table 2 presents descriptive statistics and latent correlations for the study variables. The mean scores showed that students perceived their FL teachers as experiencing a high degree of enjoyment but a relatively low level of anxiety during their language teaching. Furthermore, students generally attached a high value to English learning but report only a moderate level of control over this subject. In addition, students tended to experience more enjoyment than anxiety during English classes.

Table 2. Descriptive statistics and latent correlations of the study variables.

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5
1 Perceived teacher enjoyment	3.91	.84					
2 Perceived teacher anxiety	1.77	.66	-.50				
3 Control appraisal	3.06	.94	.52	-.32			
4 Value appraisal	3.88	.77	.54	-.28	.54		
5 Student enjoyment	3.49	.89	.53	-.20	.54	.55	
6 Student anxiety	2.78	.99	-.37	.39	-.60	-.32	-.30

Note. All correlations were statistically significant at $p < .01$.

Latent correlation analyses showed that student-perceived teacher enjoyment was positively related to their own control and value appraisals and corresponding enjoyment in relation to English learning. Meanwhile, students' perceptions of teacher anxiety were negatively associated with their control and value appraisals but positively associated with their anxiety in English classes. Students' English class-related control and value appraisals were positively correlated with their enjoyment but negatively correlated with their anxiety, respectively. All the correlations between the target variables were statistically significant and ranged from moderate to strong. The observed patterns of correlations provided the basis for examining the mediation hypotheses linking perceived teacher emotions, control-value appraisals and students' emotions.

4.3 Mediation of associations between perceived teacher emotions and students' emotions by control and value appraisals (RQ2)

We ran two separate latent mediation analyses for each pair of emotions to test the two hypotheses concerning the roles of emotion contagion and social appraisal in teacher-to-student affect transfer. We first examined the direct effects of perceived teacher emotions on students' control and value appraisals in language learning. As shown in Figure 1, perceived teacher FL enjoyment had significant positive effects on students' control and value appraisals. By contrast, perceived teacher FL anxiety had significant negative effects on students' appraisals of control and value. In the second step, we examined the effects of students' appraisals on their FL emotions after controlling for perceived teacher emotions. As can be seen, both control and value appraisals had significant positive effects on FL enjoyment. For anxiety, control appraisal but not value appraisal had significant negative

effects on FL anxiety, albeit value appraisal exhibited a negative trend. Next, we assessed the direct effects, total indirect effects, and specific indirect effects of perceived teacher emotions on students' corresponding emotions via appraisals by testing the full mediation models.

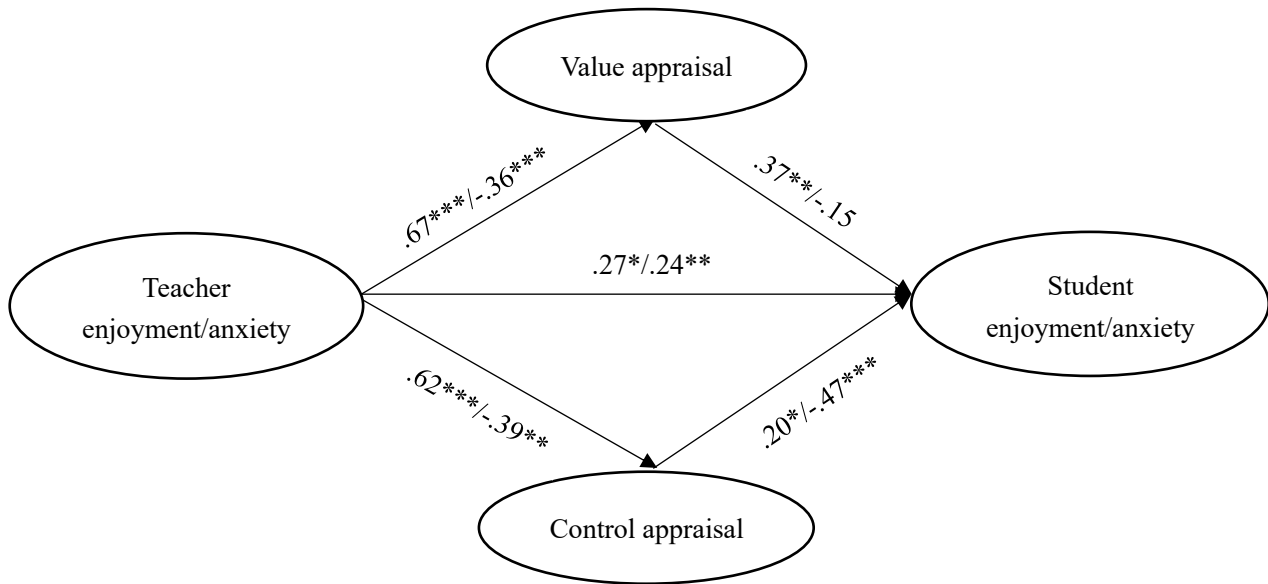


Figure 1. SEM model of associations between perceived teacher emotions, control-value appraisals, and student emotions showing standardized parameter estimates.

Note. Coefficients on the left and right sides of the slash are regression effects in the models for enjoyment and anxiety, respectively.

* $p < .05$. ** $p < .01$. *** $p < .001$.

As reported in Table 3, perceived teacher FL enjoyment yielded significant positive total indirect effects on students' FL enjoyment. A breakdown of these total indirect effects into specific indirect effects revealed that both control and value appraisals mediated the relationship between perceived teacher FL enjoyment and students' FL enjoyment, with value appraisal emerging as the stronger mediator. The direct effects of perceived peer FL enjoyment on student FL enjoyment remained significant after controlling for the two appraisals. Meanwhile, perceived teacher FL anxiety had a significant positive total indirect effect on students' FL anxiety. Analysis of the specific indirect effects revealed that the

relationship between perceived peer FL anxiety and student FL anxiety was solely mediated by control appraisal, with no mediation effect observed for value appraisal. The direct effects of perceived teacher FL anxiety on students' FL anxiety were still significant after controlling for the effects of control appraisal.

Table 3. Direct, total indirect, and specific indirect effects of teacher-student emotion transfer.

Transfer	Direct effects	Total indirect effects	Specific indirect effects	
	T→S	T→A→S	T→C→S	T→V→S
Enjoyment	.27 (.11)*	.37 (.06)***	.12 (.06)*	.25 (.08)**
Anxiety	.24 (.08)**	.23 (.09)**	.18 (.09)**	.05 (.03)

Note. Values are standardized coefficients from structural equation models. Standard errors (SE) are shown in parentheses. T = teacher; S = student; A = appraisal; C = control; V = value
 * $p < .05$. ** $p < .01$. *** $p < .001$.

4.4 Students' descriptions of teacher-to-student emotion contagion in FL classes (RQ3)

The interview responses illustrated that students were highly attuned to their teachers' enjoyment and anxiety, which they recognized through a variety of cues. These cues included teachers' facial expressions, gestures, tone of voice, and teaching style. Students' experiences suggest that teacher enjoyment often spreads directly and automatically, which helped create a shared emotional experience in the classroom. For example, one student described how their teacher's joy and enthusiasm created a ripple effect of positivity:

S4: Our teacher often tells jokes, shares funny personal experiences, and organizes engaging learning activities. The whole class gets immersed in this warm, congenial atmosphere. Whenever the teacher laughs, I laugh along spontaneously. It's hard not to feel happy and relaxed.

Similarly, another student described how the teacher's cheerfulness boosted students' enthusiasm and engagement:

S3: During a role-play activity, our teacher started laughing, and soon most of us were laughing along with her. The shared joy made us feel more connected. Feeling happy, we became more attentive and cooperative, and the whole lesson just flowed better.

These findings aligned with the quantitative results, showing that direct emotion contagion was commonly observed between perceived teacher enjoyment and student enjoyment. However, the contagion of teacher anxiety to students was less straightforward and appeared to depend on specific conditions. S8 shared that his susceptibility to teacher anxiety varied depending on his own emotional state:

I only feel anxious when I notice my teacher's anxious expressions if I'm already feeling low or stressed. If I'm in a good mood, I don't really catch that anxiety—it just doesn't affect me as much.

Additionally, the intensity of the teacher's anxiety played a key role in whether students "caught" the emotion, as reflected in S3's experience:

I'm usually not someone who gets anxious easily, but there are times when my teacher appears exceptionally anxious. In those moments, it's like being caught in an invisible force. I can't help but feel anxious too, even if I don't fully understand why.

These cases illustrate how emotion contagion operates more automatically and universally for positive emotions like enjoyment while the spread of anxiety is more contingent on factors such as the student's pre-existing emotional state and the intensity of perceived teacher anxiety.

4.5 Students' accounts of social appraisal during teacher-to-student emotion transmission (RQ4)

4.5.1 Social appraisal during the transmission of congruent emotions

In addition to direct emotion contagion, the interview responses also demonstrated that students often engaged in social appraisal when interpreting teacher emotions. These appraisals focused on students' interpretations of teachers' control (i.e., their ability to cope with teaching tasks and challenges) and value (i.e., the significance of achieving teaching goals). Consistent with the quantitative results, these appraisals were related to students' own control and value appraisals and the emergence of congruent emotions. For example, the interview findings suggest that when students perceived their teachers' enjoyment, they often attributed it to their own academic performance or behavior, such as satisfactory test scores, effective communication, or active participation in learning tasks. This positive inference reinforced students' confidence in making progress, increased their passion for learning, and ultimately intensified their language learning enjoyment, as highlighted by S7:

My teacher always seems so happy and content when we perform well, collaborate proactively, or follow her instructions during group activities. I see her enjoyment as a recognition of my efforts. Then I feel more confident in myself. English learning becomes more interesting, and I feel motivated to keep improving.

Conversely, when students perceived their teachers' anxiety, they often interpreted it as a signal of potential academic challenges or failures, which could trigger their own anxiety. However, this effect was not universal and depended on students' individual appraisals of

their capabilities and the situation. Some students would be affected and feel anxious, as shown in S6's quote:

Before the final exam, my teacher sighed, frowned, and said, 'This is going to be challenging for most of you.' Her words and expression made me start worrying. I began to doubt myself, thinking, 'What if I can't do well? What if I fail?' Her anxiety felt like a warning, and it made me anxious too.

Here, S6's appraisal of the teacher's anxiety as a lack of confidence in students' abilities undermined her sense of control and provoked her own anxiety. However, not all students were equally affected by teacher anxiety. For instance, S9, a high-achieving student, explained how his strong academic performance protected him from the emotional impact of his teacher's anxiety:

If my teacher is worried about my classmates failing an exam, it doesn't affect me at all. English is my strong subject, and I know I'll do well. Her anxiety might be a signal for others, but for me, it has no effect.

This example highlights how students' appraisals may be shaped by their individual circumstances and self-perceptions. High-proficiency students, who feel confident in their abilities, are less likely to interpret teacher anxiety as relevant to their own performance, thereby avoiding catching feelings of anxiety.

4.5.2 Social appraisal during the transmission of non-congruent emotions

Apart from the transmission of congruent emotions, the qualitative study revealed that social appraisal can also result in non-congruent emotions. Interview data shows that in some instances, perceived teacher enjoyment activated students' anxiety rather than joy. This

occurred when students interpreted the teacher's delight as a reflection of their peers' superior performance, which in turn heightened their own self-doubt and fear of inadequacy. As can be seen from S12's account, the teacher's enjoyment was appraised not as a source of shared joy but as a benchmark for comparison, which led to her feelings of inadequacy and anxiety.

When my classmates give an excellent impromptu speech or read a paragraph with a beautiful, standard accent, my teacher looks so delighted and praises their performance. Seeing this, I sometimes feel nervous and anxious. I start wondering, 'Can I ever match their level? What if I can't?'

In other instances, perceived teacher anxiety seems to have evoked emotions such as shame, guilt, and indebtedness in students. S5's narrative provides a case in point:

Our English teacher really cares about us. When we constantly make the same mistakes or our grades decline, she will look anxious. She is uncertain how to help us effectively. If I am among those who make her feel so, I will feel shameful, because learning English well is our own business. It's a shame that I can't get a good grade and make her worry about me.

Similarly, S11 reflected on how their teacher's anxiety about insufficient effort triggered feelings of guilt and indebtedness:

I know I need to put in more effort to improve my writing skills, but sometimes I'm just too lazy. When my teacher worries about me, I feel like I owe it to her to do better. I should be working harder to live up to her expectations, and her anxiety reminds me that I'm not doing enough.

These examples suggest that when students interpret their teacher's anxiety as a reflection of their own shortcomings or failures, they may develop a sense of personal responsibility for their teacher's emotional state, which can then lead to non-congruent emotional responses.

Discussion

Employing a mixed-methods design, this research explored emotion transmission of enjoyment and anxiety from the teacher to students in FL classrooms. RQ1 examined the associations between perceived teacher emotions, student appraisals and corresponding student emotions in FL learning. The positive relations between perceived teacher enjoyment and anxiety and students' corresponding emotions lend support to social-cognitive theories of learning (Bandura, 1986; Pekrun, 2006), which posit that the continuous interaction between teachers and students in the classroom is likely to influence students' cognition, emotion, and behavior. Corroborating CVT's (Pekrun, 2006, 2024) assertion that classroom environmental features may influence students' appraisals and emotions, we found positive correlations between students' control and value appraisals with perceived teacher and student enjoyment, and negative correlations with perceived teacher and student anxiety. These correlations support the overall transfer of FL emotions from teacher to students and highlight the interrelated connections among perceived teacher emotions, student appraisals, and student emotions in FL classrooms.

RQ2 explored how students' control and value appraisals might mediate associations between perceived teacher enjoyment and anxiety and students' corresponding emotions. As we predicted, control and value appraisals partially mediated the relationship between

perceived teacher enjoyment and anxiety and students' corresponding emotions. These results provide further evidence for the operation of emotion contagion and social appraisal in teacher-student emotion interaction in FL classrooms (Hatfield et al., 1994; Parkinson & Manstead, 2015). They also corroborate CVT's (Pekrun, 2006, 2024) proposition that the affective impact of social environments on students' achievement emotions is jointly mediated by control and value appraisals. Importantly, we found the two appraisals differed in their roles as mediators in the links between corresponding teacher and student emotions. Specifically, both perceived value and control mediated the relations between perceived teacher enjoyment and student enjoyment. This is in line with CVT's contention that enjoyment is generally instigated by students' high achievement-related control and positive value which were affected by students' perceptions of teacher enjoyment in the present study (Pekrun, 2006). For the relation between teacher and student anxiety, however, only control appraisal was found to be the mediator, which partially supports CVT's assertion that anxiety is likely to depend on low levels of control and high levels of value (Pekrun, 2024). A possible explanation is that value was measured as intrinsic value in this study, not as the perceived importance of achievement, which may be a stronger predictor of anxiety according to CVT (see Pekrun et al., 2023). Another explanation might be that Chinese middle school students view English as a compulsory subject crucial for their academic success. Therefore, their perception of the value of English may be relatively fixed and less likely to be affected by perceived teacher anxiety. This highlights the need to consider socio-cultural contexts in shaping students' appraisals and emotions about FL learning.

RQ3 sought to gain insights into individual students' experiences of emotion contagion in FL classrooms. Consonant with prior research (Moskowitz & Dewaele, 2021; Talebzadeh et al., 2020) and the quantitative results, the interview data suggests that perceptions of teacher enjoyment and anxiety could be directly contagious to students' corresponding emotions. These findings provide empirical evidence for the operation of an emotion contagion process (Hatfield et al., 1994) in interpersonal affective interactions in FL classrooms. Interestingly, the qualitative data further implied that enjoyment seemed more contagious than anxiety, highlighting that positive emotions are more prone to be contagious than negative emotions in FL classrooms (Parkinson & Simons, 2009). Moreover, the finding that anxiety contagion was influenced by specific factors such as student's affective state and the level of perceived teacher anxiety lends support to previous research indicating a strong connection between an individual's current mood, the intensity of emotion expression, and their susceptibility to emotion contagion (Bhullar, 2012).

RQ4 aimed to unveil the complexity of social appraisal in teacher-to-student FL emotion transmission through analyzing students' narratives. Consistent with the quantitative results, students' responses suggest that both control and value appraisals may mediate the transmission of FL enjoyment from teacher to student whereas control appraisal seems to exhibit a more prominent mediating role in FL anxiety transmission. Generally, these findings support the theoretical perspective of social appraisal, which posits that an individual's interpretation of the emotion-appraisal connections underlying other people's emotions plays a vital role in influencing their own appraisals and emotions (Parkinson, 2020). Students' inclination to interpret their teachers' enjoyment and anxiety based on the latter's control and

value appraisals resonates with Frenzel et al.'s (2018, 2021) theoretical explanation of the antecedents of teacher emotions. Furthermore, these findings not only provide further support for CVT's (Pekrun, 2006, 2024) assumptions about the combined mediation effects of control and value appraisals in the relationship between classroom features and student emotions but also extend CVT by underscoring the crucial role of socio-cultural contexts (e.g., language policy) and individual differences (e.g., language proficiency) in determining the mediating role of specific appraisals between classroom affective features and student emotions.

Importantly, the qualitative findings enriched the quantitative evidence on social appraisal and extended prior research on classroom emotion transmission by revealing that students do not always mirror their teachers' emotions directly. Instead, perceived teacher enjoyment and anxiety can trigger divergent, and at times incongruent, emotional responses among students, shaped by individual appraisal processes. For example, in cases where teacher enjoyment led to heightened student anxiety, one plausible mechanism involves peer comparison during social appraisal. Students who interpreted their teacher's enjoyment as a reaction to high-performing classmates may have engaged in upward comparison. This process, particularly salient among individuals with a strong tendency for social comparison (Parkinson, 2020), could undermine self-esteem or perceived self-competence, thereby eliciting anxiety (Diel et al., 2021). Similarly, student experiences of shame or guilt in response to perceived teacher anxiety may reflect culturally embedded interpretations of emotional cues. Within the Confucian educational tradition, which emphasizes self-improvement, diligence, and moral responsibility (Fong & Cai, 2019), teacher anxiety may be construed by students as a sign of their own inadequacy or insufficient effort. This

internalization, particularly among students driven by perfectionism, can give rise to self-critical emotions such as shame and guilt.

Limitations and future directions

This study has several limitations that offer directions for future research. First, the reliance on self-reported data may have introduced response biases, potentially affecting the validity of the findings. Future research should incorporate more objective measures of emotional experience and appraisal, such as EEG, fMRI, or implicit emotion measures. Second, the present study focused on students' perceptions of teacher emotions as an indicator of teachers' emotional experiences and did not incorporate teachers' self-reports of their subjective emotions. Future studies may consider integrating both students' perceptions and teacher self-reports to offer a more comprehensive examination of teacher-to-student emotion transmission. Third, the cross-sectional design limits the ability to capture the temporal dynamics of teacher-to-student FL emotion transmission. Longitudinal designs that collect data across multiple time points can trace the evolution of these emotional processes and their developmental trajectories over time. Fourth, the findings revealed that some students' emotional responses to perceived teacher FL emotions were conditional, suggesting that individual and contextual factors may moderate the transmission process. Future investigations should assess the role of learner-specific variables (e.g., FL proficiency, mood) and classroom-level variables (e.g., teacher–student relationship) in shaping the degree and direction of emotional transmission. Finally, although this study focused on enjoyment and anxiety, other teacher emotions, such as anger and boredom, also play critical roles in the emotional climate of FL classrooms. Future research should investigate how such emotions

influence students' affective and learning experiences to develop a more comprehensive understanding of emotion dynamics in language education.

Pedagogical implications

This research offers important implications for understanding the emotional dynamics between teachers and students in foreign language pedagogy. Given the positive relationship between teacher and student enjoyment, we encourage teachers to express positive emotions such as enjoyment, enthusiasm, hope, pride and so forth, which can bring ripple effects on students' corresponding emotions towards FL learning (Shao & Parkinson, 2024). Teachers' positively charged emotions may also enhance students' perceived control over, and subjective value for, language learning, which, in turn, can stimulate their positive affective experiences in FL classes. When students experience positive emotions, especially enjoyment, a myriad of positive effects on FL learning will ensue, including higher levels of motivation and engagement, reduced anxiety, greater willingness to communicate, and improved academic achievement (Frenzel et al, 2021).

Moreover, FL teachers should be cautious in conveying negative emotions such as anxiety or anger, which may trigger students' negative emotions such as anxiety, shame, or guilt, according to the results of the present study. It is advisable for teachers to explicitly talk to students about the causes behind their negative emotions and let students share their concerns in the FL classrooms. Then they can move forward by encouraging students to enhance their FL self-concept, making concrete study plans for individual students, and monitoring the progress of their language learning. Teachers can motivate students to invest more effort and help them revise their plans as students advance. By acknowledging students'

progress and achievements, teachers will enable students to become more competent both cognitively and emotionally.

Furthermore, our study suggests that teachers' emotional expressions are not just passive signals but active cues that students interpret and internalize. Therefore, FL teacher professional development programs can design training procedures to equip teachers with knowledge about the mechanisms underlying classroom emotion transmission and their impact on students' language learning experiences, so that they can make theoretically and empirically informed decisions when managing their emotion expressions in FL classes. Professional learning activities can be organized to facilitate teachers' reappraisal of the meanings of FL teaching, update their teaching beliefs and techniques, acknowledge their accomplishments, and cultivate a sense of control and value (Zhang et al., 2023). Moreover, FL teacher education curricula could also incorporate reflective practices and case studies whereby teachers can reflect on their emotion-related teaching practices and improve emotion-regulation strategies (Gkonou & Miller, 2021).

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