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## EDITED BY

Getachew Tassew Woreta,  
Wollo University, Ethiopia

## REVIEWED BY

Emilio Jesús Lizarte,  
University of Granada, Spain  
Silvia Fernández Gea,  
University of Almería, Spain

## \*CORRESPONDENCE

Yu Li

✉ liyu5995@163.com

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# How perceived interparental conflict shapes academic engagement in Chinese adolescents: a moderated mediation model

Yu Li\* and YuMei Han

Southwest University, Chongqing, China

**Objectives:** This study aimed to investigate the impact of Chinese high school students' perceived interparental conflict on their academic engagement, with a focus on the mediating roles of positive and negative academic emotions and the moderating role of emotional intelligence.

**Background:** In China, parents often suppress interparental conflicts until after their children's college entrance exams to avoid disrupting the latter's academic performance. However, unresolved interparental conflict may impair adolescents' psychological wellbeing and academic engagement. Grounded in the Cognitive-Contextual Theory and the Emotional Security Theory, this research explored how perceived interparental conflict influences academic engagement through academic emotions, and how emotional intelligence buffers these adverse effects.

**Methods:** The study used data from 257 high school students in City G, Province S of China. Hierarchical regression analysis was employed to test the proposed mediating and moderating hypotheses.

**Results:** Perceived interparental conflict had a significant negative impact on academic engagement; both positive and negative academic emotions partially mediated the relationship between perceived interparental conflict and academic engagement; emotional intelligence weakened the negative impact of perceived interparental conflict on positive academic emotions, and mitigated the positive impact of the former on negative academic emotions.

**Conclusion:** This study confirmed the negative impact of perceived interparental conflict on high school students' academic engagement, revealed the mechanism by which interparental conflict in the family environment influences academic engagement, and proposed targeted measures and practical suggestions to prioritize students' academic emotional regulation and enhance their emotional intelligence in both school and family contexts.

## KEYWORDS

Perception of Interparental Conflict, academic engagement, academic emotions, emotional intelligence, high school students

# 1 Introduction

In recent years, the surge in divorces immediately following the college entrance examination (Gaokao) has emerged as a notable social phenomenon in China. This trend reflects a pattern where couples intending to divorce deliberately conceal marital conflicts and postpone separation until after their children's Gaokao—a pivotal high-stakes examination in an individual's life—to mitigate potential adverse effects on their psychological wellbeing and academic performance. Notably, academic performance and academic engagement are inherently interconnected: academic engagement, as a sustained psychological investment in learning, serves as a key precursor to improved academic performance (Megi et al., 2024), while positive academic performance further reinforces students' willingness to engage in learning activities. Additionally, existing studies have confirmed that non-core variables of this research also exert significant influences on academic engagement: for instance, self-efficacy enhances academic engagement by boosting students' confidence in completing learning tasks (Lizarte Simón et al., 2024), and psychological wellbeing reduces emotional exhaustion to maintain stable engagement (Pan et al., 2023), while anxiety (a negative emotional state closely related to psychological wellbeing) may undermine engagement (Meng and Zhang, 2023). These findings highlight the need to clarify the specific pathways through which perceived interparental conflict affects academic engagement, while acknowledging the broader contextual role of other psychological variables.

Chinese parents have long prioritized their children's education, often making significant personal sacrifices (Qiu, 1998). Extensive research highlights the strong link between parental relationships and children's developmental outcomes within family contexts (Deng et al., 2001). As the primary social environment for adolescents, families play a central role in shaping students' growth trajectories, with parental interactions serving as critical determinants (Liu, 2015). While maintaining familial harmony through conflict suppression before major examinations may appear beneficial, empirical evidence suggests that adolescents from divorced households exhibit superior psychological adjustment compared to those in intact families characterized by frequent and intense parental discord (Amato and Keith, 1991). Crucially, the quality of parental communication and conflict resolution—rather than marital status *per se*—emerges as the decisive factor influencing adolescent development (Deng et al., 2016). Unresolved interparental conflicts may disproportionately harm high school students, particularly those navigating the pressures of impending Gaokao.

High school students, situated at a critical juncture of adolescence and educational transition, face immense academic demands necessitating sustained engagement. Academic engagement, defined as a positive and fulfilling psychological state associated with learning activities (Schaufeli et al., 2002), serves as a vital metric for evaluating learning processes. It not only informs pedagogical improvements and institutional quality enhancement (Li and Alexander, 2021) but also fosters psychological resilience by cultivating optimism, adaptability, purposefulness, and creativity (Fang et al., 2008). Although supportive family environments are known to bolster academic

engagement and achievement (Yang, 2021), real-world households often experience varying degrees of parental conflict. Children's perception of such conflict exacerbates psychological stress and increases vulnerability to maladaptive behaviors (Chi, 2005). This study aims to systematically explore the influence of Chinese high school students' perceived interparental conflict on their academic engagement, clarify the mediating role of positive and negative academic emotions, and verify the moderating role of emotional intelligence, thereby providing empirical support for interventions to protect students' academic and psychological development.

## 2 Literature review

### 2.1 Perception of interparental conflict and academic engagement

Humans are social beings. In the process of interacting with others, differences in personality, habits, worldviews, and values inevitably lead to conflicts between individuals and others (Halliday, 1978). Interparental conflict refers to verbal or physical aggression, disputes, or other behaviors between spouses in the family due to inconsistent opinions, conflicting values, or other reasons. As a key factor influencing the development of children and adolescents (Ma et al., 2017), interparental conflict has been extensively studied by researchers, with these studies primarily based on two theoretical models.

The Cognitive-Contextual Theory posits that children and adolescents' cognitive appraisal of interparental conflict plays a crucial role in how such conflict affects their psychological development. Cognitive appraisal consists of primary processing and secondary processing: primary processing mainly evaluates the characteristics and nature of interparental conflict, while secondary processing focuses on assessing the causes of the conflict and its impact on oneself (Grych and Fincham, 1990; Wang et al., 2014). In the context of academic engagement, the role of this cognitive appraisal manifests as follows: when high school students perceive interparental conflict as frequent, intense, and difficult to resolve (primary processing), or attribute it to their own faults and perceive it as a threat to family stability (secondary processing), their cognitive resources become overoccupied. This, in turn, crowds out the psychological resources available for learning, leading to reduced learning vitality and distracted attention. The Children's Perception of Interparental Conflict Scale (CPIC), developed by Grych et al. (1992), is widely used by researchers because it measures both the characteristic levels of interparental conflict and the cognitive appraisal of the conflict's causes and impact on oneself. Scholars in China have adapted this scale based on Chinese culture and students' developmental levels, integrating dimensions such as conflict frequency and intensity (used to measure the level of perceived interparental conflict) into a single "conflict intensity" dimension. Among them, conflict intensity, conflict resolution, conflict threat, triangulation, self-attribution, and coping effectiveness are six key dimensions of perceived interparental conflict (Chi and Xin, 2003; Zhao and Mo, 2006). Considering the heavy academic workloads and time constraints of high school students, this study selects three dimensions—conflict intensity, self-involved conflict, and threat level—to measure

the characteristic levels and cognitive appraisals of interparental conflict among high school students.

In contrast, the Emotional Security Theory emphasizes that the impact of interparental conflict on children essentially occurs by undermining their emotional security (Davies and Cummings, 1994). When interparental conflict persists or remains unresolved, children perceive instability in family relationships, which in turn triggers emotional responses such as fear and anxiety, leading to emotional insecurity. This emotional state inhibits academic engagement through two pathways: first, it directly consumes emotional resources, making it difficult for students to maintain enthusiasm for learning; second, it triggers sustained vigilance, resulting in difficulty concentrating during learning (Ding et al., 2022). Studies by Chinese scholars have confirmed that perceived interparental conflict positively predicts children's behavioral problems (Li, 2016)—particularly regarding academic engagement. Such emotional insecurity reduces adolescents' learning motivation and increases distracted behaviors (Li et al., 2023).

To summarize, the Cognitive-Contextual Theory and the Emotional Security Theory reveal the internal mechanisms by which perceived interparental conflict affects academic engagement from the perspectives of cognitive appraisal and emotional security, respectively. Specifically, regarding the three dimensions of academic engagement (vitality, dedication, and absorption): (1) Inhibition of vitality: Vitality is reflected in abundant energy and resilience during learning. Perceived interparental conflict may consume learning vitality through two pathways: cognitively, high school students' repeated rumination on interparental conflict (e.g., "Will they get divorced?") occupies their psychological resources, leading to insufficient energy for learning (Wang et al., 2014); emotionally, sustained anxiety caused by emotional insecurity weakens physiological energy reserves, making them prone to fatigue during long periods of learning. Existing studies have confirmed that adolescents who perceive more frequent interparental conflict experience stronger feelings of exhaustion during learning and significantly lower endurance when completing complex tasks (Liu and Tang, 2022). (2) Inhibition of dedication: Dedication manifests as a sense of meaning and enthusiasm for learning, such as recognizing the value of learning and actively participating in learning activities. Family emotional support is an important foundation for adolescents to develop a sense of meaning in learning, and interparental conflict undermines this support: when high school students perceive tension in their parents' relationship, they may question the reliability of family stability, thereby weakening their belief in achieving future goals through learning (Wang, 2022). Meanwhile, the appraisal of conflict threat in the Cognitive-Contextual Theory causes adolescents to shift their attention from pursuing academic achievements to coping with family crises, reducing their active engagement in learning. (3) Inhibition of absorption: Absorption refers to focused attention during learning. Perceived interparental conflict particularly impairs absorption: on one hand, worries about family instability (from the Emotional Security Theory) become a persistent distraction, leading to frequent inattention during lectures or problem-solving; on the other hand, repeated attribution of conflict causes (e.g., "Did my poor grades cause their fight?") in cognitive processing forms rumination, further diverting attention from learning (Li et al., 2023).

In conclusion, both the negative appraisals emphasized by the Cognitive-Contextual Theory and the emotional insecurity revealed by the Emotional Security Theory point to the inhibitory effect of perceived interparental conflict on academic engagement—and this inhibition covers the three core dimensions of vitality, dedication, and absorption. Based on this, this study proposes Hypothesis 1 (H1): Perceived interparental conflict has a significant negative impact on the academic engagement of high school students.

## 2.2 The mediating role of academic emotions

Pekrun conceptualizes academic emotions as affective experiences arising in academic contexts, closely tied to learning activities, instructional outcomes, and academic performance. These emotions encompass diverse states such as enjoyment, pride, boredom, and anxiety. Based on valence and activation levels, Pekrun further categorizes academic emotions into four dimensions: positive high-arousal (e.g., excitement), positive low-arousal (e.g., contentment), negative low-arousal (e.g., boredom), and negative high-arousal (e.g., anxiety) (Pekrun et al., 2002). As research on academic emotions has deepened, their conceptualization has expanded. Chinese scholars adapted Pekrun's framework to develop the Youth Academic Emotions Questionnaire (YAEQ), incorporating culturally specific dimensions like calmness, helplessness, and frustration, thereby enriching the understanding of students' affective experiences in academic settings (Dong and Yu, 2007). Broadly, academic emotions can be classified into positive (e.g., happiness, satisfaction) and negative (e.g., anxiety, boredom) categories. This study focuses on two prototypical emotions: academic enjoyment (representing positive emotions) and academic anxiety (representing negative emotions).

The growing theoretical and applied research on academic emotions has spurred investigations into their correlations with other variables and underlying mechanisms. First, antecedent studies reveal that family environment factors shape students' academic emotions through perceived control and value appraisals (Pekrun, 2006). Empirical evidence demonstrates that perceived interparental conflict positively predicts academic anxiety and negatively predicts academic enjoyment (Wang et al., 2021; Tu, 2017), aligning with findings on the family environment's critical role in children's holistic development, academic achievement, and social adaptation (Hunt et al., 2017; Wang et al., 2018). Second, outcome-oriented research confirms that positive academic emotions enhance academic engagement (Lin et al., 2020), self-efficacy (Li and Song, 2011), and achievement (Dong and Yu, 2010).

Within family systems, adolescents perceiving relational instability due to parental conflict may develop adverse emotions. These emotions, when transferred to school contexts, could manifest as diminished positive academic emotions and heightened negative ones. Grounded in emotional security theory, this study posits academic emotions as mediators between perceived interparental conflict and academic engagement. Investigating this mediation mechanism can clarify how parental conflict perceptions

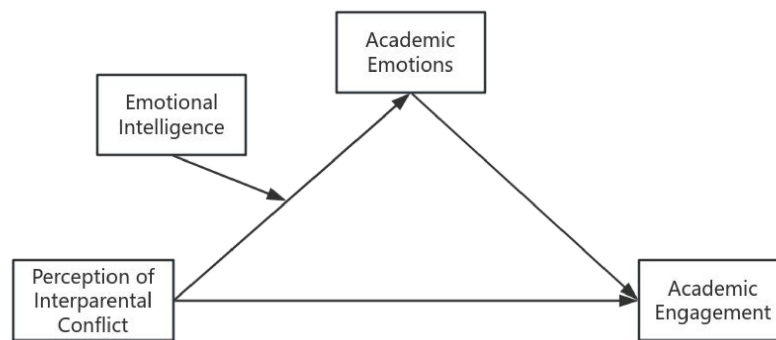


FIGURE 1  
Moderated mediation model of academic emotion and emotional intelligence.

influence learning outcomes and inform strategies to improve educational effectiveness. Accordingly, the following hypotheses are proposed:

Hypothesis 2: Academic emotions mediate the relationship between perceived interparental conflict and academic engagement among high school students. Specifically:

H2a: Academic enjoyment mediates the effect of perceived interparental conflict on academic engagement.

H2b: Academic anxiety mediates the effect of perceived interparental conflict on academic engagement.

## 2.3 The moderating role of emotional intelligence

Since Mayer and Salovey first introduced emotional intelligence into psychological research in 1990, it has remained a subject of extensive research and debate (Liu and Zou, 2010). Grounded in the ability model, which conceptualizes emotional intelligence as a competence, Goleman's Emotional Intelligence outlines five dimensions: self-awareness, emotion regulation, self-motivation, empathy, and interpersonal skills, forming the foundational five-factor framework (Daniel, 1997). Lu (2005) further posits emotional intelligence as a distinct psychological trait encompassing the capacity to perceive, express, experience, and regulate emotions—characteristics that differentiate it from other cognitive abilities while retaining the essential attributes of general competencies. Thus, emotional intelligence can be defined as an individual's ability to manage emotional processes effectively.

Empirical studies indicate that emotions influence individuals' environmental perceptions, thereby shaping behaviors, with emotional intelligence moderating these effects (Wang et al., 2013; Peter et al., 2002). As a subset of emotions, academic emotions are similarly subject to modulation by emotional intelligence. Specifically, students with higher emotional intelligence can not only recognize their academic emotions but also adaptively adjust

them to optimize learning processes and outcomes. For instance, in low-conflict family environments, emotionally intelligent students may leverage positive emotions (e.g., joy, satisfaction) to enhance motivation, stimulate curiosity, and sustain high levels of academic engagement. Conversely, in high-conflict environments, such students employ strategies like cognitive reappraisal, distraction, or seeking social support to mitigate negative emotions (e.g., anxiety) and maintain learning resilience.

This study positions emotional intelligence as a moderating variable in the relationship between perceived interparental conflict and academic emotions among high school students. By examining how emotional intelligence buffers the mediating effects of academic emotions on engagement, this research aims to provide evidence-based strategies for mitigating the adverse impacts of parental conflict. The following hypotheses are proposed:

Hypothesis 3: Emotional intelligence moderates the first stage of the mediation pathway (perceived interparental conflict→academic emotions→academic engagement). Specifically:

H3a: The mediating effect of positive academic emotions between perceived interparental conflict and academic engagement weakens as emotional intelligence increases.

H3b: The mediating effect of negative academic emotions between perceived interparental conflict and academic engagement weakens as emotional intelligence increases.

Synthesizing the above findings and research hypotheses, this study constructed a theoretical model, as shown in Figure 1:

## 3 Materials and methods

### 3.1 Participants

This study focused on high school students in City G, Province S. Using convenience sampling, one high school was randomly



selected, and institutional approval was obtained prior to data collection. Participants were selected based on the following inclusion and exclusion criteria: Inclusion Criteria included (1) currently enrolled as a high school student in City G, Province S; (2) willing to participate in the study and able to understand the content of the questionnaires (confirmed via a brief pre-survey comprehension check); (3) having lived with both parents for at least six consecutive months prior to the survey (to ensure sufficient exposure to interparental interactions). All procedures followed internationally recognized ethical principles for psychological research and ethical norms for psychological research in China. For participants under 18: (1) Written informed consent was obtained from parents/guardians via schools (detailing study purpose, anonymous data use, risks, and withdrawal rights); (2) Verbal assent was obtained from participants after explaining the study via simplified forms. Raw data were anonymized with unique codes and stored in a password-protected database (research team access only).

An electronic questionnaire QR code was distributed to all enrolled high school students. A total of 296 responses were collected, with 257 valid questionnaires retained after data cleaning, yielding an effective response rate of 86.82%. As shown in Table 1, the sample exhibited balanced gender distribution (approximately 50% male and 50% female). Sophomores constituted the majority (68.48%), followed by freshmen and juniors. Regarding family structure, 55.25% ( $n = 142$ ) were non-only children. In terms of household registration, 55.25% ( $n = 142$ ) originated from rural areas.

## 3.2 Instruments

### 3.2.1 Perception of Interparental Conflict Scale

This study employed the revised Perception of Interparental Conflict Scale developed by Zhao and Mo (2006), comprising three dimensions: conflict severity, self-involvement, and perceived threat. The 22-item scale uses a five-point Likert format to

assess students' perceptions of parental conflict intensity, self-attribution patterns, and personal impact. Internal consistency coefficients for the three dimensions were 0.932 (conflict severity), 0.891 (self-involvement), and 0.871 (perceived threat). Confirmatory factor analysis demonstrated strong structural validity:  $\chi^2/df = 1.119$ , CFI = 0.992, TLI = 0.991, RMSEA = 0.022, SRMR = 0.04.

### 3.2.2 Academic emotion scale

The Academic Emotions Questionnaire for Adolescents (AEQA) (Dong and Yu, 2007) was adapted to measure positive academic emotions (e.g., academic enjoyment, six items) and negative academic emotions (e.g., academic anxiety, six items). Sample items include: "Learning brings me joy" (positive) and "I feel nervous before exams" (negative). Reliability coefficients were 0.871 (positive emotions) and 0.900 (negative emotions). Confirmatory factor analysis supported structural validity:  $\chi^2/df = 1.429$ , CFI = 0.986, TLI = 0.982, RMSEA = 0.041, SRMR = 0.054.

### 3.2.3 Academic Engagement Scale

The Utrecht Work Engagement Scale for Students (UWES-S) (Fang et al., 2008) was adapted to assess academic engagement across three dimensions: vigor (six items), dedication (five items), and absorption (five items). Responses were recorded on a seven-point Likert scale, with higher scores indicating greater engagement. Subscale reliability coefficients were 0.905 (vigor), 0.873 (dedication), and 0.908 (absorption). Structural validity was confirmed:  $\chi^2/df = 1.118$ , CFI = 0.994, TLI = 0.994, RMSEA = 0.022, SRMR = 0.076.

### 3.2.4 Emotional Intelligence Scale

The Wong and Law Emotional Intelligence Scale (Law et al., 2004) was utilized, measuring four dimensions: self-emotion appraisal, others' emotion appraisal, emotion regulation, and emotion utilization. The 16-item scale employs a five-point Likert format. Subscale reliabilities were 0.868 (self-appraisal), 0.837 (others' appraisal), 0.812 (emotion use), and 0.830 (emotion control). Confirmatory factor analysis indicated excellent fit:  $\chi^2/df = 1.028$ , CFI = 0.998, TLI = 0.998, RMSEA = 0.011, SRMR = 0.039, confirming cultural appropriateness in Chinese contexts.

## 3.3 Data processing

Data were analyzed using SPSS 25.0 for descriptive statistics, reliability assessment, and correlation analysis. Confirmatory factor analysis (CFA) was conducted via AMOS 26.0 to evaluate construct validity (Wu, 2010). Mediation and moderated mediation effects were tested using the SPSS PROCESS macro, employing bootstrapping (5,000 resamples) to assess indirect effects and moderated pathways, which offers superior statistical power over traditional causal steps approaches (Wen et al., 2022).

TABLE 1 Frequency of basic information.

| Item                  | Options                    | Frequency | Percentage (%) |
|-----------------------|----------------------------|-----------|----------------|
| Gender                | Male                       | 129       | 50.19          |
|                       | Female                     | 128       | 49.81          |
| Grade                 | First year senior          | 82        | 31.91          |
|                       | Second year in high school | 94        | 36.58          |
|                       | Third-year senior          | 81        | 31.52          |
| Whether an only child | Yes                        | 115       | 44.75          |
|                       | No                         | 142       | 55.25          |
| Place of residence    | Towns                      | 115       | 44.75          |
|                       | Countryside                | 142       | 55.25          |
| Total                 |                            | 257       | 100.0          |

## 4 Findings

### 4.1 Descriptive statistics and correlations

Table 2 presents the descriptive statistics (means and standard deviations) and intercorrelations among key variables: perceived interparental conflict, positive academic emotions, negative academic emotions, academic engagement, and emotional intelligence.

Significant negative correlations were observed between perceived interparental conflict and both positive academic emotions ( $r = -0.166, p < 0.05$ ) and academic engagement ( $r = -0.172, p < 0.05$ ). Conversely, perceived interparental conflict showed a significant positive correlation with negative academic emotions ( $r = 0.152, p < 0.05$ ). As hypothesized, positive academic emotions were positively associated with academic engagement ( $r = 0.253, p < 0.05$ ), while negative academic emotions exhibited a negative association ( $r = -0.181, p < 0.05$ ).

### 4.2 Intermediary testing

#### 4.2.1 Mediation effect of positive academic emotions

Using Model 4 of the PROCESS macro in SPSS 25.0, the mediation analysis revealed the following (Tables 3, 4): Total Effect: Perceived interparental conflict significantly negatively predicted academic engagement ( $B = -0.187, t = -2.79, p < 0.05$ ). Perceived interparental conflict also negatively predicted positive academic emotions ( $B = -0.051, t = -2.688, p < 0.05$ ). Mediation Pathway: Positive academic emotions exerted a significant positive effect on academic engagement ( $B = 0.811, t = 3.791, p < 0.05$ ). The indirect effect of perceived interparental conflict on academic engagement through positive academic emotions was significant [ $B = -0.042, 95\% \text{ CI } (-0.086, -0.008)$ ]. Direct Effects: The direct effect remained significant after accounting for mediation ( $B = -0.145, t = -2.193, p < 0.05$ ), indicating partial mediation. These results confirm that perceived interparental conflict influences academic engagement via the mediating role of positive academic emotions.

TABLE 2 Descriptive statistics of variables.

| Variable                             | Score   | SE     | Perception of Interparental Conflict | Positive academic emotions | Negative academic emotions | Academic engagement | Emotional intelligence |
|--------------------------------------|---------|--------|--------------------------------------|----------------------------|----------------------------|---------------------|------------------------|
| Perception of Interparental Conflict | 69.942  | 15.786 | 1                                    | 1                          | 1                          | 1                   | 1                      |
| Positive academic emotions           | 17.2763 | 4.890  | −0.166**                             |                            |                            |                     |                        |
| Negative academic emotions           | 16.8482 | 5.672  | 0.152*                               | −0.584**                   | 1                          | 1                   | 1                      |
| Academic engagement                  | 71.416  | 17.155 | −0.172**                             | 0.253**                    |                            |                     |                        |
| Emotional intelligence               | 47.969  | 10.972 | 0.002                                | −0.013                     | 0.028                      | 0.056               | 1                      |

\* $P < 0.05$ . \*\* $P < 0.01$ .

TABLE 3 Mediation test for positive academic mood.

| Variable                             | Learning engagement    |        |         | Positive academic emotions |        |         | Academic engagement     |        |         |
|--------------------------------------|------------------------|--------|---------|----------------------------|--------|---------|-------------------------|--------|---------|
|                                      | Beta                   | t      | P       | Beta                       | t      | P       | Beta                    | t      | P       |
| Constant                             | 84.497                 | 17.580 | 0.000** | 20.872                     | 15.219 | 0.000** | 67.572                  | 10.441 | 0.000** |
| Perception of Interparental Conflict | −0.187                 | −2.790 | 0.006** | −0.051                     | −2.688 | 0.008** | −0.145                  | −2.193 | 0.029*  |
| Positive academic emotions           |                        |        |         |                            |        |         | 0.811                   | 3.791  | 0.000** |
| $R^2$                                | 0.03                   |        |         | 0.028                      |        |         | 0.082                   |        |         |
| F                                    | $F = 7.783, p = 0.006$ |        |         | $F = 7.224, p = 0.008$     |        |         | $F = 11.279, p = 0.000$ |        |         |

\* $P < 0.05$ . \*\* $P < 0.01$ .

TABLE 4 Mediating effect values test for positive academic emotions.

| Path                                                                                | Total effect | Intermediary effect | SE    | (95% boot CI)  | Direct effect | Percentage of intermediary effects |
|-------------------------------------------------------------------------------------|--------------|---------------------|-------|----------------|---------------|------------------------------------|
| Perception of Interparental Conflict→positive academic emotions→academic engagement | −0.187**     | −0.042              | 0.021 | −0.086, −0.008 | −0.145*       | 22.26%                             |

\* $P < 0.05$ . \*\* $P < 0.01$ .

4.2.2 Mediation effect of negative academic emotions

As illustrated in Tables 5, 6, the mediation analysis yielded the following results for the pathway perceived interparental conflict→negative academic emotions→academic engagement: Total Effect: Perceived interparental conflict significantly negatively predicted academic engagement ( $B = -0.187, t = -2.79, p < 0.05$ ). Perceived interparental conflict positively predicted negative academic emotions ( $B = 0.055, t = 2.459, p < 0.05$ ). Mediation Pathway: Negative academic emotions exhibited a significant negative effect on academic engagement ( $B = -0.478, t = -2.56, p < 0.05$ ). The indirect effect of perceived interparental conflict on academic engagement through negative academic emotions was significant [ $\beta = -0.026, 95\% \text{ CI } (-0.063, -0.002)$ ]. Direct Effects: The direct effect remained significant after controlling for the mediator ( $B = -0.161, t = -2.397, p < 0.05$ ), indicating partial mediation. These findings demonstrate that perceived interparental

conflict influences academic engagement via the mediating role of negative academic emotions.

4.3 Reconciliation tests

4.3.1 Moderated mediation analysis via positive academic emotions

To examine the moderating role of emotional intelligence in the first stage of the mediation pathway (perceived interparental conflict→positive academic emotions→academic engagement), this study conducted a moderated mediation analysis using PROCESS Model 7. Results are summarized in Tables 7, 8: Moderation Effect: The interaction term between perceived interparental conflict and emotional intelligence significantly predicted positive academic emotions ( $B = 0.005, t = 2.713, p < 0.05$ ), indicating that emotional intelligence moderates the

TABLE 5 Mediation test for negative academic emotions.

| Variable                             | Learning engagement  |        |         | Negative academic emotions |       |         | Academic engagement  |        |         |
|--------------------------------------|----------------------|--------|---------|----------------------------|-------|---------|----------------------|--------|---------|
|                                      | Beta                 | t      | P       | Beta                       | t     | P       | Beta                 | t      | P       |
| Constant                             | 84.497               | 17.580 | 0.000** | 13.023                     | 8.168 | 0.000** | 90.724               | 16.987 | 0.000** |
| Perception of Interparental Conflict | -0.187               | -2.790 | 0.006** | 0.055                      | 2.459 | 0.015*  | -0.161               | -2.397 | 0.017*  |
| Negative academic emotions           |                      |        |         |                            |       |         | -0.478               | -2.560 | 0.011*  |
| R <sup>2</sup>                       | 0.03                 |        |         | 0.023                      |       |         | 0.054                |        |         |
| F                                    | F = 7.783, p = 0.006 |        |         | F = 6.047, p = 0.015       |       |         | F = 7.254, p = 0.001 |        |         |

\*P < 0.05. \*\*P < 0.01.

TABLE 6 Mediating effect values test for negative academic emotions.

| Path                                                                                | Total effect | Intermediary effect | SE    | (95% boot CI)  | Direct effect | Percentage of intermediary effects |
|-------------------------------------------------------------------------------------|--------------|---------------------|-------|----------------|---------------|------------------------------------|
| Perception of Interparental Conflict→negative academic emotions→academic engagement | -0.187**     | -0.026              | 0.016 | -0.063, -0.002 | -0.161*       | 13.9%                              |

\*P < 0.05. \*\*P < 0.01.

TABLE 7 Moderated intermediary test.

| Variable                                                    | Academic engagement   |       |        |         | Positive academic emotions |       |        |         |
|-------------------------------------------------------------|-----------------------|-------|--------|---------|----------------------------|-------|--------|---------|
|                                                             | Beta                  | SE    | t      | P       | Beta                       | SE    | t      | P       |
| Constant                                                    | 67.572                | 6.472 | 10.441 | 0.000** | 17.275                     | 0.298 | 57.921 | 0.000** |
| Perception of Interparental Conflict                        | -0.145                | 0.066 | -2.193 | 0.029*  | -0.058                     | 0.019 | -3.026 | 0.003** |
| Emotional intelligence                                      |                       |       |        |         | -0.006                     | 0.027 | -0.219 | 0.827   |
| Perception of Interparental Conflict*emotional intelligence |                       |       |        |         | 0.005                      | 0.002 | 2.713  | 0.007** |
| Positive academic emotions                                  | 0.881                 | 0.214 | 3.791  | 0.000** |                            |       |        |         |
| R <sup>2</sup>                                              | 0.082                 |       |        |         | 0.055                      |       |        |         |
| F                                                           | F = 11.279, p = 0.000 |       |        |         | F = 4.926, p = 0.002       |       |        |         |

\*P < 0.05. \*\*P < 0.01.

TABLE 8 Moderated intermediary index.

| Moderator variable     | Intermediary variable      | Index | SE    | LLCI  | ULCI  |
|------------------------|----------------------------|-------|-------|-------|-------|
| Emotional intelligence | Positive academic emotions | 0.004 | 0.002 | 0.001 | 0.008 |

relationship between perceived interparental conflict and positive academic emotions. Moderated Mediation Index: The index of moderated mediation was 0.004, with a 95% confidence interval (0.001, 0.008) excluding zero, confirming a statistically significant moderated mediation effect.

To further investigate the moderating role of emotional intelligence in the mediation pathway (perceived interparental conflict→positive academic emotions→academic engagement), participants were categorized into high and low emotional intelligence groups based on mean ± 1 standard deviation. Table 9 presents the indirect effects and 95% Bootstrap confidence intervals for these groups. High Emotional Intelligence Group: The indirect effect through positive academic emotions was non-significant [ $B = -0.006$ , 95% CI  $(-0.058, 0.047)$ ]. Low Emotional Intelligence

Group: The indirect effect was significant ( $B = -0.088$ , 95% CI  $(-0.159, -0.034)$ ). A significant difference in indirect effects was observed between the two groups. To clarify this interaction, a simple slope analysis was conducted (Figure 2). Results revealed that the negative effect of perceived interparental conflict on positive academic emotions was stronger in the low emotional intelligence group compared to the high group. Furthermore, the mediating role of positive academic emotions diminished as emotional intelligence increased.

4.3.2 Moderated mediation analysis via negative academic emotions

As shown in Tables 10, 11, the interaction term between perceived interparental conflict and emotional intelligence

TABLE 9 Mediating effect values for positive academic emotions at different levels of emotional intelligence.

| Moderator variable         | Level              | Value   | Effect | SE    | LLCI   | ULCI   |
|----------------------------|--------------------|---------|--------|-------|--------|--------|
| Positive academic emotions | Low level (−1 SD)  | −10.972 | −0.088 | 0.032 | −0.159 | −0.034 |
|                            | Mean               | 0.000   | −0.047 | 0.021 | −0.093 | −0.011 |
|                            | High level (+1 SD) | 10.972  | −0.006 | 0.026 | −0.058 | 0.047  |

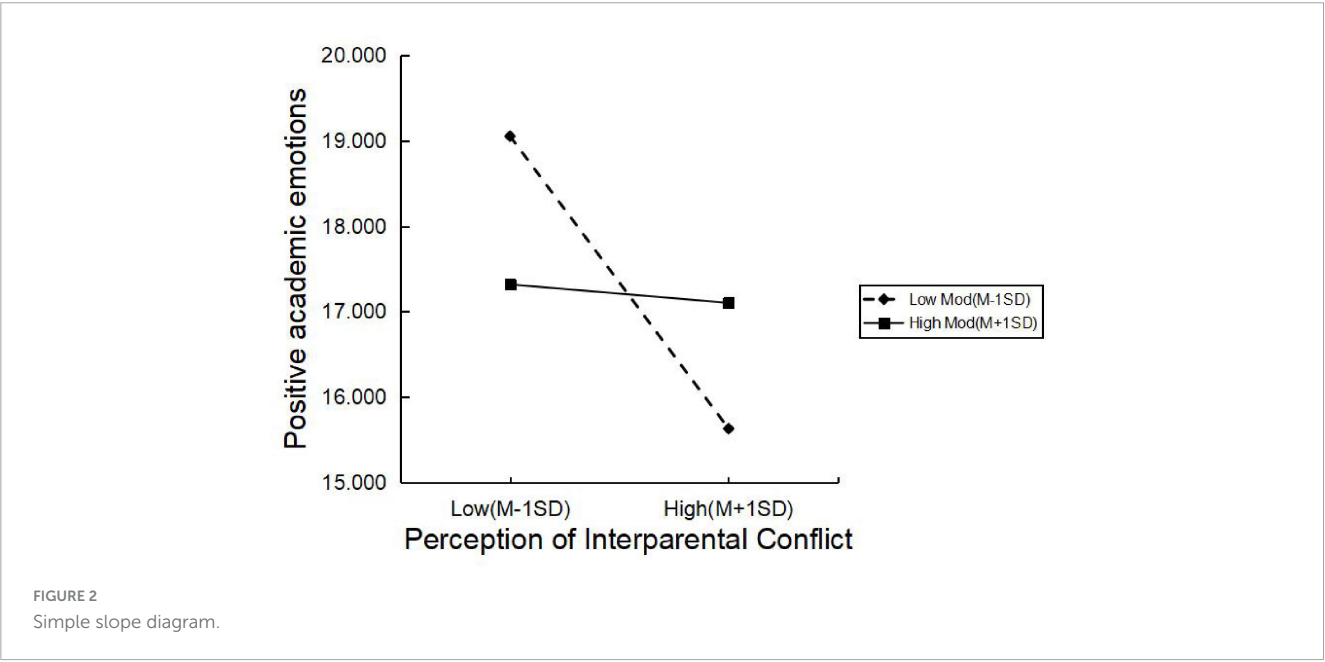


TABLE 10 Moderated intermediary test.

| Variable                                                    | Academic engagement  |       |        |         | Negative academic emotions |       |        |         |
|-------------------------------------------------------------|----------------------|-------|--------|---------|----------------------------|-------|--------|---------|
|                                                             | Beta                 | SE    | t      | P       | Beta                       | SE    | t      | P       |
| Constant                                                    | 90.724               | 5.341 | 16.987 | 0.000** | 16.850                     | 0.349 | 48.346 | 0.000** |
| Perception of Interparental Conflict                        | −0.161               | 0.067 | −2.397 | 0.017*  | 0.060                      | 0.022 | 2.713  | 0.007** |
| Emotional intelligence                                      |                      |       |        |         | 0.014                      | 0.032 | 0.454  | 0.650   |
| Perception of Interparental Conflict*emotional intelligence |                      |       |        |         | −0.004                     | 0.002 | −2.134 | 0.034*  |
| Negative academic emotions                                  | −0.478               | 0.187 | −2.560 | 0.011*  |                            |       |        |         |
| R <sup>2</sup>                                              | 0.054                |       |        |         | 0.041                      |       |        |         |
| F                                                           | F = 7.254, P = 0.000 |       |        |         | F = 3.620, P = 0.014       |       |        |         |

\*P < 0.05. \*\*P < 0.01.

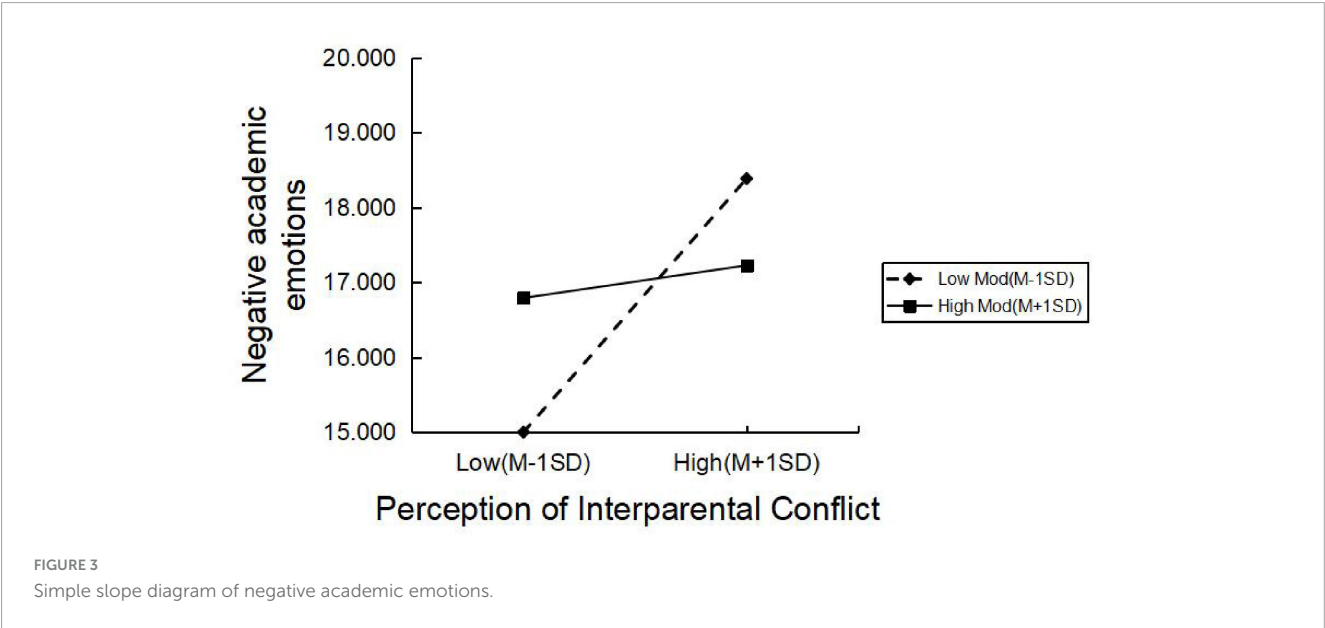


TABLE 11 Moderated intermediary index.

| Moderator variable     | Intermediary variable      | Index | SE    | LLCI  | ULCI  |
|------------------------|----------------------------|-------|-------|-------|-------|
| Emotional intelligence | Negative academic emotions | 0.002 | 0.001 | 0.000 | 0.005 |

TABLE 12 Mediating effect values for negative academic emotions at different levels of emotional intelligence.

| Moderator variable         | Level              | Value   | Effect | SE    | LLCI   | ULCI   |
|----------------------------|--------------------|---------|--------|-------|--------|--------|
| Negative academic emotions | Low level (−1 SD)  | −10.972 | −0.051 | 0.027 | −0.109 | −0.008 |
|                            | Mean               | 0.000   | −0.029 | 0.017 | −0.066 | −0.003 |
|                            | High level (+1 SD) | 10.972  | −0.007 | 0.016 | −0.041 | 0.024  |



significantly negatively predicted negative academic emotions ( $B = -0.004$ ,  $t = -2.134$ ,  $p < 0.05$ ), demonstrating that emotional intelligence moderates the relationship between perceived interparental conflict and negative academic emotions. The index of moderated mediation was 0.002, with a 95% confidence interval (0.000, 0.005) excluding zero, confirming a statistically significant moderated mediation effect.

To further examine the moderating role of emotional intelligence in the mediation pathway (perceived interparental conflict→negative academic emotions→academic engagement), participants were stratified into high and low emotional intelligence groups based on mean  $\pm$  1 standard deviation. Table 12 displays the indirect effects and 95% Bootstrap confidence intervals for these groups: High Emotional Intelligence Group: The indirect effect through negative academic emotions was non-significant [ $B = -0.007$ , 95% CI (−0.041, 0.024)]. Low Emotional Intelligence Group: The indirect effect was significant [ $B = -0.051$ , 95% CI (−0.109, −0.008)]. A significant difference in indirect effects emerged between the two groups. A simple slope analysis (Figure 3) clarified this interaction: The positive effect of perceived interparental conflict on negative academic emotions was stronger in the low emotional intelligence group compared to the high group. The mediating role of negative academic emotions diminished as emotional intelligence increased.

The findings demonstrate that both positive and negative academic emotions partially mediate the relationship between perceived interparental conflict and academic engagement. Furthermore, emotional intelligence moderates the initial stage of these mediation pathways: Path 1: Perceived interparental conflict→positive academic emotions→academic engagement

Path 2: Perceived interparental conflict→negative academic emotions→academic engagement

Notably, higher emotional intelligence attenuated the indirect effects of parental conflict on engagement via academic emotions. The moderated mediation models are illustrated in Figures 4, 5.

## 5 Discussion and conclusion

This study examined the relationship between perceived interparental conflict and academic engagement among 257 general high school students in China, exploring the mediating roles of positive and negative academic emotions and the moderating role of emotional intelligence. Below is a detailed discussion of key findings, contextualized within recent empirical studies and theoretical frameworks.

Perceived interparental conflict demonstrated significant negative correlations with positive academic emotions ( $r = -0.166$ ,  $p < 0.05$ ) and academic engagement ( $r = -0.172$ ,  $p < 0.05$ ), and

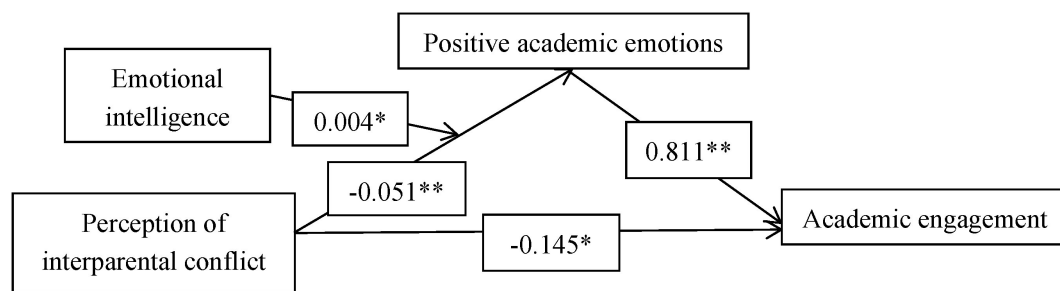


FIGURE 4

Regulating mediated path coefficients of positive academic emotions and emotional intelligence (\* $p < 0.05$  \*\* $p < 0.01$ ).

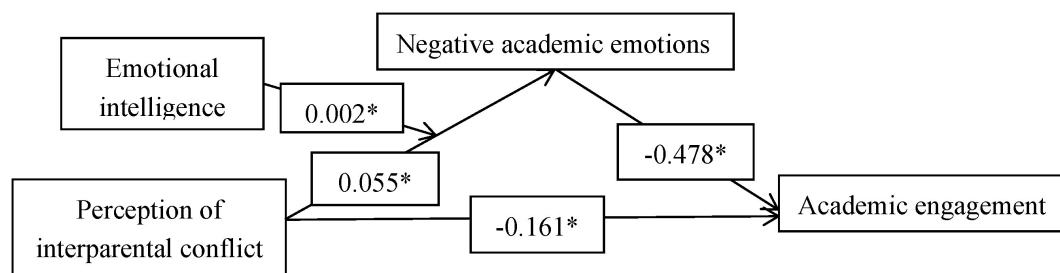


FIGURE 5

Regulating mediated path coefficients of negative academic emotions emotional intelligence (\* $p < 0.05$  \*\* $p < 0.01$ ).

a positive correlation with negative academic emotions ( $r = 0.152$ ,  $p < 0.05$ ). This aligns with a 2024 study by Wang et al. (2024), which found that Chinese students' perceived parental conflict was negatively associated with internalizing/externalizing problem behaviors. These consistencies confirm that parental conflict, as a key family stressor, exerts stable adverse effects on high school students' academic-related emotions and behaviors across different samples.

Both positive and negative academic emotions partially mediated the relationship between perceived interparental conflict and academic engagement (Hypotheses 2&3 supported). Specifically, perceived interparental conflict reduced academic engagement by decreasing positive emotions [indirect effect =  $-0.042$ , 95% CI ( $-0.086$ ,  $-0.008$ )] and increasing negative emotions [indirect effect =  $-0.026$ , 95% CI ( $-0.063$ ,  $-0.002$ )]. This extends the findings of Zhang et al. (2023), Deng (2023), our study further differentiates emotional valence and confirms that “loss of positive emotions” is equally important as “gain of negative emotions” in explaining engagement decline. From the theoretical perspective, this supports both Cognitive-Contextual Theory (Grych and Fincham, 1990) and Emotional Security Theory (Davies and Cummings, 1994): students perceiving frequent conflict experience cognitive overload and emotional insecurity, which squeeze psychological resources for positive emotional experiences and learning focus.

Emotional intelligence attenuated the negative effects of perceived interparental conflict on positive academic emotions ( $\beta = 0.005$ ,  $p < 0.05$ ) and its positive effects on negative academic emotions ( $\beta = -0.004$ ,  $p < 0.05$ ; Hypotheses 4 supported). This is consistent with recent work by Naman (2021), who found that

an inverse correlation between EI and academic stress in high school students. Our study adds nuance by showing that emotional intelligence does not eliminate conflict effects entirely but “weakens the transmission chain”: students with high emotional intelligence use strategies like cognitive reappraisal or social support-seeking to maintain positive emotions and reduce negative ones.

## 5.1 Limitations and future directions

Cross-sectional design: The study's correlational data preclude causal inferences. Longitudinal designs could clarify temporal dynamics. Sample representativeness: Convenience sampling limits generalizability. Future studies should diversify samples across regions and school types. Emotion granularity: This study focused on valence (positive/negative) but not arousal levels (e.g., high vs. low arousal). Investigating arousal-specific effects could deepen understanding of emotion-mediated pathways.

## 5.2 Practical implications

Educators and parents should prioritize fostering emotional intelligence and creating supportive environments to buffer adolescents from familial stressors. School-based interventions, such as counseling programs and emotion-regulation workshops, could enhance students' resilience and academic engagement.

Meanwhile, this study confirms that perceived interparental conflict negatively affects high school students' academic engagement through the dual mediating pathways of positive

and negative academic emotions, and that emotional intelligence weakens this adverse effect. The findings not only enrich the theoretical understanding of the “family-academic” link in Chinese cultural contexts but also provide actionable strategies for schools, universities, and families to support adolescents’ academic and psychological development. With further longitudinal and diverse-sample research, these insights could be refined to better address the needs of Chinese high school and first-year university students.

## 6 Recommendations

### 6.1 Integrating Emotional pedagogy: a holistic framework for cultivating student emotional intelligence through educator modeling, curricular design, and school-family collaboration

Teachers play a pivotal role in fostering students’ emotional competence (Salovey and Mayer, 1990). To systematically cultivate emotional intelligence (EI), educators should:

- Embed EI Development into Curricula:** Design structured activities such as emotion identification exercises, regulation training (e.g., mindfulness meditation, cognitive reappraisal), and scenario-based role-playing to enhance self-awareness and interpersonal skills.
- Incorporate reflective practices** where students articulate emotions through journals or group discussions.
- Model Emotionally Intelligent Behaviors:** Teachers should exemplify effective emotion management and communication. For instance, demonstrating calm conflict resolution during classroom disagreements or openly discussing personal strategies for stress management.
- Adopt a student-centered approach** by empathizing with learners’ perspectives, fostering trust through active listening, and co-creating classroom norms that prioritize emotional safety.
- Strengthen School-Family Partnerships:** Establish regular communication channels (e.g., parent-teacher conferences, digital platforms) to share updates on students’ academic and emotional wellbeing. For families experiencing interparental conflict, schools should offer targeted support, including counseling services and workshops on constructive conflict resolution, to mitigate adverse impacts on students.
- Institutionalize Emotional Education:** Integrate EI training into teacher professional development programs. Implement mandatory mental health courses that teach coping strategies, resilience-building, and social-emotional skills, moving beyond *ad hoc* interventions to systemic curricular integration.

### 6.2 Beyond the classroom: cultivating emotional intelligence through parental dynamics—integrating role modeling, conflict navigation, and dialogic pedagogy in family systems

Family environments critically shape EI development. Parents should adopt the following strategies:

- Promote Positive Parenting Practices:** Transition from authoritarian or permissive styles to

- authoritative parenting**, balancing warmth with clear boundaries (Lu et al., 2016).
- Model healthy conflict resolution:** Address disagreements calmly, emphasize collaborative problem-solving, and avoid hostile interactions in children’s presence.
- Enhance Parental Emotional Literacy:** Engage in EI training programs, workshops, or self-directed learning (e.g., books, online courses) to improve emotion recognition, expression, and regulation.
- Practice techniques** such as “emotional labeling” (e.g., “I feel frustrated because...”) to normalize constructive emotional discourse.
- Foster Open Family Communication:** Schedule regular family meetings to discuss challenges, celebrate achievements, and validate each member’s perspectives.
- Encourage children** to articulate their feelings using prompts like, “How did that situation make you feel?” while actively listening without judgment.
- Leverage Community Resources:** Collaborate with schools to access counseling services or peer support groups for families navigating high-conflict dynamics.
- Participate in community-based EI initiatives**, such as parent-child mindfulness sessions or cooperative games that reinforce empathy and teamwork.

## Data availability statement

The datasets presented in this study can be found in online repositories. The names of the repository/repositories and accession number(s) can be found in the article/[supplementary material](#).

## Author contributions

YL: Writing – original draft. YH: Writing – review & editing.

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## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

## Generative AI statement

The authors declare that Generative AI was used in the creation of this manuscript. Translating the abstracts of some Chinese-language reference literatures into English to facilitate the integration of international research background; Proofreading and optimizing the English expressions in the manuscript (e.g., polishing the wording of the “Response to Reviewers” and adjusting the syntax of English paragraphs in the Discussion section) to ensure compliance with academic writing norms.

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## Supplementary material

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/feduc.2025.1627341/full#supplementary-material>

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