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Sex differences in how are mothers' SES related to late adolescents' emotional stability in China: the mediating role of maternal parenting styles

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Abstract

Background The impact of mothers' socioeconomic status (SES) on late adolescents' emotional stability, as well as the mechanisms underlying this relationship, remain poorly understood in China. Additionally, the mechanisms by which SES impacts emotional stability may need investigated separately for the male and female adolescents.

Method This study conducted a snowball sampling and invited undergraduates to complete a survey via online. A sample of 445 Chinese undergraduate students (229 males, age range of 18–25 years) completed questionnaires concerning their mothers' monthly income and educational levels, emotional stability, and maternal parenting styles. Independent samples t-test, correlation analyses and regression analyses were performed.

Results The findings suggested the levels of emotional stability in female students were significantly lower than those of male students. Mothers' SES was related to late adolescents' emotional stability significantly. Moreover, maternal parenting styles (emotional warmth, punishment, overprotection, and rejection) significantly mediated the relationship between mothers' SES and late adolescents' emotional stability. Additionally, the particular features of these relationships varied according to the sex of the late adolescents. For the male students, maternal parenting styles could not significantly serve as mediating roles. For the female adolescents, the effect of maternal SES on emotional stability was partially mediated by four separate pathways: (1) maternal emotional warmth, (2) maternal punishment, (3) maternal overprotection, and (4) maternal rejection. These findings provide crucial practical implications for identification, prevention, and intervention efforts in late adolescents' emotional stability across sex.

Conclusion This study sheds light on the relationship between mothers' SES and late adolescents' emotional stability, and the indirect effects of maternal emotional warmth, punishment, overprotection, and rejection serving as mediating roles. Maternal parenting styles had a higher effect on the emotional stability in female adolescents than male adolescents. This also provides crucial practical implications for identifying, preventing, and intervening in late adolescent emotional stability, which may differ between female and male adolescents.

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Keywords Mothers' socioeconomic status, Maternal parenting styles, Emotional stabilit, Sex differences, Late adolescents

Introduction

Parents and family are important factors for human development, according to Bronfenbrenner [1]. Among them, parents' socioeconomic status (SES) and parenting styles were consistently reinforced as essential factors for individuals developmental outcomes by Family Stress Model and empirical research findings [2, 3]. Emotional stability has drawn special attention in recent years, since it is one of the most significant antecedents to psychological health [4, 5]. However, the relationships among mothers' SES, parenting styles and the emotional stability of their children have received far less attention in China. Thus, this is the goal of the present study.

Emotional stability

Emotional stability can be viewed as a personality trait [6]. Although researchers believe its concept and construct consistently [7], the majority of studies indicates that emotional stability is the polar opposite of neuroticism [4, 8]. This suggests that emotional instability may be equivalent to neuroticism. Neuroticism is generally defined as a frequent tendency to experience negative emotions in the face of a variety of stressors [8, 9]. In other words, emotional stability refers to a person's tendency to respond with stable and positive emotions in the face of a threat, frustration, or loss. The term "emotional stability" was used in this study instead of "neuroticism". Because the concept of neuroticism used in personality theory is rooted clinical psychology, previous research has mostly focused on the link between neuroticism and negative outcomes [10]. With the emergence of positive psychology, positive attributes that promote human well-being should receive more attention. As a result, there is a growing need for positive-oriented research.

The evidence of previous studies revealed emotional stability has beneficial consequences. Individuals with stable emotions tend to strike a balance between positive and negative experiences in life. In general, emotionally stable individuals are calm, undisturbed and approach problems in a constructive and hopeful manner [11, 12]. As a result, their social adjustment and mental contentment level are higher. Several research have reached similar conclusions. Emotional stability mitigates the influence of negative childhood events on quality of life, both physically and cognitively [4] and may lead to greater life satisfaction [13]. On the contrary, most of existing evidence suggests that emotional stability has a negative impact such as depression [10, 14], and Alzheimer's disease [15]. Given the superiority of high emotional stability, the antecedents of emotional stability deserve consideration.

According to the perspective of ecosystem theory, multiple factors influence the development of individual psychological traits, the most recent of which is family or parents [1]. This study focused on mothers' socioeconomic status and parenting styles.

SES and emotional stability

Socioeconomic status (SES) is a hierarchical ranking based on the degree to which an individual or household accesses or commands valuable resources, such as affluence, social positions, and power [16]. It synthesizes the basic state of economic, human and social capital [17]. The parents' education levels and household income are two commonly used international indicators for valuing SES [18]. SES has been recognized by psychologists as one of the major influences on psychological developmental outcomes [19]. This is especially true with respect to emotional stability. One study found that adult emotional stability was related to childhood SES in Sweden [20]. The similar results have been observed in Australia [21] and China [22]. The family investment model indicates that a higher SES of the family implies greater access to economic, social and humankind capital and greater parental investment in the education of their offspring, thus contributing to children's development [2]. According to the resource conservation theory, parental investment could become psychological resources which may help adolescents to deal with stress [23] and improve well-being. Given the above empirical literature and theoretical perspectives, this study could formulate research Hypothesis 1: mothers' SES significantly predicts the emotional stability of late adolescents. The higher the mother's SES the greater the emotional stability of late adolescents.

Mothers' SES, maternal parenting styles and adolescents' emotional stability

Parenting styles involves the attitudes, emotional expressions and behaviors that parents exhibit while raising their children [24]. The maternal parenting styles perceived by Chinese children and adolescents include emotional warmth, punishment, overprotection and rejection. These are based on the Chinese version of the Egna Minnen Beträffande Uppfostran: One's Memories of Upbringing (EMBU) [25]. EMBU and its revised versions had been widely employed due to clearly specified dimensions and good reliabilities [26–28]. EMBU applied recall of the past to ask respondents to report on their

perceptions and experiences with their parents' rearing. It originally consisted of four factors: rejection, emotional warmth, overprotection, and favoring subject [26]. However, due to China's larger one-child populations and low internal consistency of the "Favoring Subject" factor [29], this study did not include the dimension of Favoring Subject. The Chinese revision of the EMBU added the dimension of punishment [25], which is frequently utilized by Chinese parents [30]. Emotional warmth is the expression of support, care, and acceptance through actions and words. Punishment, a form of harsh discipline, indicates the use of physical force to correct or control a child's behavior when he or she makes a mistake (e.g., spanking the child's bottom or hands with the bare hand) [25]. Overprotection refers to a parent who is worried about the child, controls them and has high expectations of them [28]. Rejection is defined as being hostile and critical when parents verbally blame their child [31]. Punishment, overprotection and rejection are common ways which parents employ to control and regulate their children [28]. This study raised that these four maternal parenting styles might mediate the relationship between mothers' SES and adolescent emotional stability.

Firstly, it is believed that parents' specific parenting styles may either help or inhibit their offspring's emotional stability development [32]. Bowlby's attachment theory states that parents provide security and affection for their children. Parents' lack of love, neglect of the child's needs, or suppression the child's autonomy may gradually lead to the child developing anxious attachments [33]. Children with anxious attachments may grow up to be anxious and immature, eventually developing traits of emotional instability [5]. A large body of previous research have consistently indicated that children and adolescents with high emotional stability are often associated with experiencing positive parenting styles such as parental warmth, less controlling parenting [34, 35]. When parents exhibit more controlling styles, their children are less emotionally stable [5, 36]. High levels of parental overprotection and parental rejection were found to be negatively linked associated with emotional stability [27]. Authoritarian parenting which is a less warm parenting style was positively correlated with adolescent neuroticism [37]. These associations are not only present in childhood and adolescence, but also in the late adolescence and young adulthood. When Japanese young adults' parents used affectionless control, their emotional stability increased. In contrast, adults who experienced caring parenting reported higher levels of emotional stability [34]. This is congruent with the findings from young adults in Indonesia [38] and late adolescent in Slovak [39]. Data from undergraduate students in the United States showed that the authoritative parenting style (a harsh controlling parenting style) had a strong relationship with college students' self-esteem, which may enhance emotional adjustment [40]. Moreover, parental overprotection in childhood was negatively associated with emotional stability in Japanese middle-aged adults [41].

This study only examined the role of maternal parenting styles. An increasing number of studies have reported that mothers and fathers play diverse roles in families in modern years [42]. Compared to fathers, mothers tended to spend more time with adolescents and were more careful about their children's emotional well-being [43]. Furthermore, mothers were perceived as more supportive, accepting, responsive [44, 45] and less monitoring than did fathers [46]. Maternal and paternal parenting styles even had independently different effects on adolescents' developmental outcomes including emotional well-being [47]. Therefore, maternal and paternal parenting styles need to be explored separately. In general, mothers are the primary caregivers of their children in China [48]. This study drew some research ideas from several studies [49, 50] and aimed to explore the impact of the role of mothers. Although there were few studies, one study reported that maternal optimal parenting which is warm and loving predicted emotional stability positively [34]. Maternal harsh controlling style and permissive style was negatively related to high emotional quotient in the students at Delhi University, India [51]. Maternal neglectful parenting may contribute to low emotional stability [38]. Based on the above literature review, maternal parenting styles may have significant relationships with emotional stability of late adolescents.

Secondly, mothers' SES may have a relationship with maternal parenting style. Parents with higher levels of education and income are more likely to practice emotionally warm parenting styles [52]. Repetti argued that low SES maybe a risk of low parental support [53]. Parents with low SES may be more inclined to engage in passive parenting strategies, such as strict parental control [54], parental punishment and even parental rejection [55]. Economic disadvantage may exacerbate parental hostility and rejection [56]. According to rational emotive behavior therapy, ones' emotions expression and behavior are strongly influenced by their cognitions [57]. The level of education may shape the cognition. The effect of the mother's education level on her parenting styles should be more carefully considered. Findings showed that higher maternal education was linked with lower maternal control and greater sensitivity [58]. Therefore, mothers' SES in this study was assessed using two indicators: mothers' education level and household income.

Thirdly, maternal parenting styles may act as mediating roles in the relationship between mothers' SES and adolescents' emotional stability. Simply exploring the separate roles of mothers' SES and maternal parenting

styles on emotional stability does not reveal the entire picture. Notably, the Family Stress Model and the Family Investment Model both indicate the indirect impact of parental SES on developmental outcomes through parenting styles [19]. The Family Stress Model states that financial hardship in the family may have an indirect effect on children's developmental outcomes through poor parenting styles [19]. This was due to the fact that difficult economic circumstances could trigger emotional and behavioral problems in parents, which can negatively impact their parenting. In turn, negative parenting behaviors undermine children's emotional well-being. The Family Investment Model proposed that the higher the family's SES is, the more parental nurturing and material investment in the adolescent, which is linked to higher levels of positive personality traits of adolescents [59]. The mediating role of parenting practices has been described in previous studies [3, 60]. Mothers with a high economic and social status are less likely to face financial distress [19]. They are willing to invest financial and emotional resources in their children and tend to perform warm, caring parenting [19]. Such parenting styles help children form secure attachments [33] and satisfy their basic psychological needs [61]. As the child progresses through adolescence and adulthood, he or she may become more trusting of others and emotionally stable. However, mothers with low SES may be locked in financial and emotional distress and prone to have conflicts with family members [19]. Negative parenting styles such as punishment, strict control (overprotection), and hostility (rejection) may be displayed [19]. This may lead to the child acquiring insecure attachments [33], not getting basic psychological needs met [61], and being prone to anxiety and uncertainty. As the child grows into adolescence and adulthood, he or she may become more sensitive and anxious about the surroundings, as well as gradually develop unstable emotional traits.

In summary, this study proposed Hypothesis 2: Maternal parenting styles mediate the relationship between mothers' socioeconomic status and late adolescents' emotional stability.

Differences between Female and Male Adolescents.

The underlying moderating influence of adolescent sex should also be considered. First of all, maternal parenting styles may vary across the adolescent sex. The transactional model states that a child's features such as sex, might affect the way parents approach them [47, 62]. Thus, mothers may exhibit parenting styles in different ways based on whether the child is a boy or a girl [47]. For example, parents in low SES families may spend more time disciplining female adolescents than male adolescents [63].

Second, it has also been found that the female and the male may be affected differently by parental rearing [45]. The interactional model implies that, no matter how parents treat their offspring, the sex of the children may influence how parenting affects them [47, 62]. Even when parents exhibit the same parenting behaviors, sons and daughters may have different experiences. Females felt parental supervision and disciplined behavior more than males did [45]. While males reported higher parental psychological control than females did [64]. Several studies have shown that the specific parenting behaviors of mothers and fathers are strong predictors of adolescent behavior in same-sex children [65, 66]. Mothers exercised more control over their daughters than over their sons, and maternal support was more prominent for daughters [45]. Social learning theory explains why same-sex parents play a greater role in a child's development. Social learning is about imitating others, and adolescents are more prone to imitate the behavior of same-sex parents [67]. A study found that adolescents were more willing to spend more time with their same-sex parents and build closer bonds with them [68]. This is a long way from explaining the deeper impact between parents and children of the same sex. Accordingly, female adolescent emotional stability may be greater related to their mothers' parenting styles than male students. To sum up, this study developed research Hypothesis 3: Sex moderates the relationship between maternal parenting styles and late adolescents' emotional stability.

The current study

The goal of the present study is to examine whether mothers' SES contributes to late adolescents' emotional stability and how maternal styles act as a mediating role between the two variables, and to explore possible sex differences in these relationships. Considering all the previous discussions together, this study presented a framework, which is shown in Fig. 1.

It was assumed that a late adolescent with a high mothers' SES would develop high emotional stability. High maternal SES may be related with high maternal emotional warmth and low negative maternal parenting styles (punishment, overprotection, and rejection), resulting in high emotional stability. Finally, the current study further expected significant sex differences in how maternal parenting styles associate with late adolescents' emotional stability. Given the limited research in this field, however, this study did not propose particular hypotheses about the nature of these differences.

This study may contribute to the existing literature on the subject in the following ways. First, whereas many researches have focused on early and middle adolescence group, there has been little research on the antecedents of late adolescents' emotional stability in China. Despite the fact that late adolescents spend most of their time away from home, much evidence suggested that

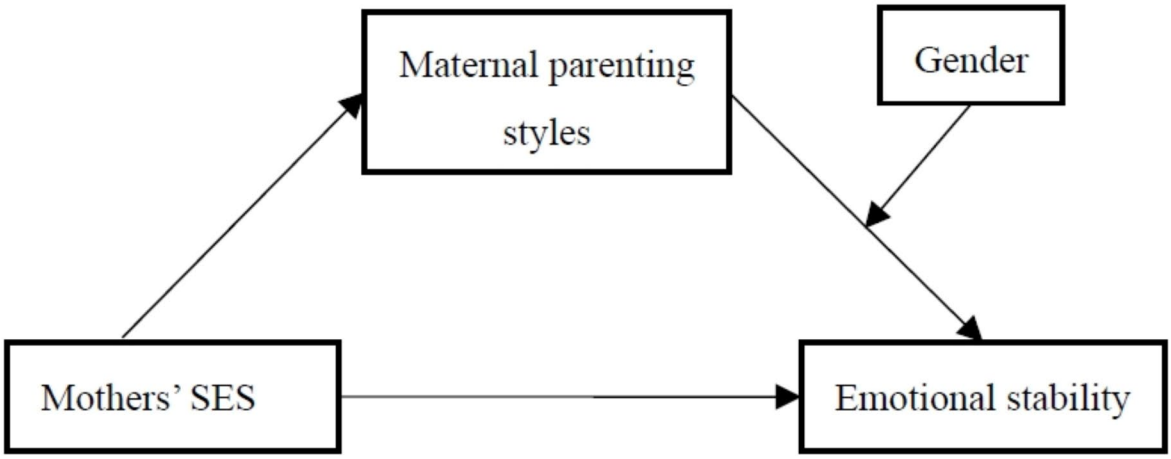

Fig. 1 Research model

parenting styles can still affect emerging adult development [40, 69–72]. Since parents may shape the attachment styles in childhood which could contribute the development throughout their lives [33]. Late adolescents in university are at a vital stage in their journey to adulthood. They are under pressure not only to pursue academics and self-identity, but also to pursue careers [73]. These stressors may be risk factors for the development of undesirable personality traits such as emotional instability. To achieve the goal of prevention and intervention, it is necessary to explore the influencing factors of late adolescents' emotional stability in depth, to identify approaches to improve emotional stability, and promote the development of college students' psychological well-being.

Second, previous findings have demonstrated that it is crucial to consider the sex of the adolescent when examining the effects of parenting [45]. However, this is not always done in parenting research in China. Therefore, this study takes the sex of both parents and adolescents into account to provide a more detailed and in-depth understanding of parenting. Last but not least, there may be cultural differences in how children perceive and interpret their parents' parenting styles. In China, as the saying goes, hitting is affection and scolding is love. Chinese adolescents tend to explain parental discipline and even punishment more positively. That is, they believe that their parents' punishment is motivated by their love for them. However, parental control and punishment may be perceived as passive in some Western countries where individualistic values are dominant [74]. Thus, studies conducted in different countries and cultures will help to clarify the specific effects of parenting. The study of parenting in China is demanding.

Materials and methods

Participants

This study conducted a convenience sampling and invited undergraduate to complete a survey via online. A total of 451 questionnaires were returned. After excluding invalid questionnaires, 445 questionnaires were valid, for a validity rate of 98.67%. According to the Morgan formula, 384 respondents were enough for a large population [75]. The survey sample was aged 18 to 25 years old, with a mean age of 21.05 ± 1.71. According to researchers, late adolescent age range is approximately 17 to 19 years old [76]. In addition, it was said that cognitive and physical size development may continue into the 20s (especially in males) [77]. Therefore, this study called this sample as late adolescents. The target percentage of late adolescents was 51.50% male (229 male students). There are four grades and the percentages of freshmen to seniors in each grade were 22.00%, 17.30%, 25.40%, and 35.30%, respectively.

Measures

The questionnaire consisted of four parts. The first section gathered demographic information including sex, age, grade. The remaining three sections are three scales that measure mothers' SES, maternal parenting styles and undergraduate students' emotional stability.

Questionnaire on the socioeconomic status of mothers

The socioeconomic status (SES) of mothers in this study utilized monthly household income and the level of education of mothers, which are indicators commonly used in general research [3]. Since total family income is taken into account by mothers when they practice parenting. Monthly family income was categorized as "less than 2,000 RMB, 2,000–5,000 RMB, 5,000–10,000 RMB, and 10,000 RMB or more", which was scored as 1–4 points. The mothers' education levels were divided into "primary school, junior high school, high school, bachelor's degree, and master's degree and above", which were scored as 1–5 points, respectively. In this study, the scores of these two indicators were first transformed into Z scores, and then the two were added together [78]. The values range from − 2.70 to 3.18, with higher scores indicating higher levels of mothers' SES.

The Chinese version of egna minnen beträffande uppfostran: one's memories of upbringing (EMBU)

The present study used the Chinses version of EMBU which was revised by Yue [25]. The current study evaluated four parenting styles: maternal emotional warmth, maternal punishment, maternal overprotection, and maternal rejection. A 4-point Likert scale (from 1 = "strongly disagree" to 4 = "strongly agree") scale was used, with higher scores representing stronger corresponding parenting styles. Since it is done by the child, it may reduce socially expected response bias [79]. Based on confirmatory factor analysis, the factor loadings of 7 items for overprotection were less than 0.50. Then these 7 items were removed. As a results, 45 items were remained. The modified model indicated that the construct validity of the instrument was good, $\chi^2/df = 1.858$, $p < 0.001$, CFI = 0.942, TLI = 0.935, RMSEA = 0.044, 90% CI [0.041, 0.047], SRMR = 0.052. The internal consistency coefficients for emotional warmth, punishment, overprotection, and rejection subscale in this study were α = 0.94, 0.93, 0.87, 0.91, and 0.93 for each subscale.

Emotional stability scale

The emotional stability scale which was developed by Chinese researcher consists of 29 items and evaluate one's emotional stability [80]. It is a Likert 3-piont scale, ranging 0–2 points. The lower the score is, the higher level of the emotional stability is. The total score can be categorized into 4 levels, with 0–20 points indicating the best emotional stability, followed by 21–40 pionts, 40–50 pionts, and 50 points or more indicating poor emotional stability and the need for further diagnosis by a psychiatrist [81]. The internal consistency coefficient of this scale in this test is 0.90, which indicates a good reliability. Confirmatory factor analysis indicated that the factor loadings of all the items met the psychometric requirements and the construct validity of the instrument was good, $\chi^2/df = 1.659$, $p < 0.001$, CFI = 0.944, TLI = 0.934, RMSEA = 0.039, 90% CI [0.033, 0.044], SRMR = 0.055.

Procedure

A cross-sectional web survey was performed. Late adolescents from four universities in Shandong Province, China, were invited to participate in this study via snowball sampling. Specifically, participants were asked to invite peers or fellow college students to complete the survey. These new participants then invited other university students they knew, and so forth. The researcher distributed written consent forms to participants and informed them of the purpose of the study, time requirements, the participant's right to reject participation or withdraw at any time, data confidentiality, and other ethical considerations. When the researcher obtained consent from a specific undergraduate student, she sent the anonymous questionnaire to the student to answer the questionnaire. It took almost 10–15 min to complete the survey.

Statistical analyses

The statistical analyses were performed by using SPSS 27.0 and PROCESS 4.0. The data analysis was conducted in four steps. First, univariate normality (by Skewness and Kurtosis), multivariate outliers, and cases with missing values were examined. Based on the criteria Skewness ≤ 2 and Kurtosis ≤ 7 [82], all the main variables were normally distributed in this sample. Since the model estimation method in this study utilized maximum likelihood estimation. It has been shown that the results of maximum likelihood estimation are robust even for moderate deviations from normality [83]. Then, common method bias analysis was conducted by Harman's One-Factor Test for factor analysis (unrotated exploratory factor analysis) [84]. Among all factors with eigenvalues above 1 obtained, if the first factor explains less than 40% of the variance, it means that there is no common method bias in the study [84]. Thirdly, descriptive statistics, Pearson correlation analysis and an independent sample t-test were conducted. Frequencies, percentages, means, and standard deviations were used to represent the levels of the research demographic and main variables. Independent sample t-test were used to check sex differences across maternal parenting styles and students' emotional stability. Pearson correlations were performed to identify the strength of the linkage between mothers' SES, maternal parenting styles and emotional stability. Lastly, moderating mediation analyses were conducted via PROCESS macro [85], to assess the role of parenting styles and sex in the associations between mothers' SES and emotional stability. All variables were standardized to minimize multicollinearity. Parameter estimation

Table 1 Descriptive statistics and correlations between the main variables

	M ± *SD*	1	2	3	4	5	6	7
1 Mothers' SES	0.00 ± 1.76	-						
2 Maternal Emotional Warmth	2.88 ± 0.67	0.35***	-					
3 Maternal Punishment	1.56 ± 0.61	-0.19***	-0.43***	-				
4 Maternal Overprotection	1.82 ± 0.58	0.34**	-0.34***	0.77***	-			
5 Maternal Rejection	1.65 ± 0.62	-0.23***	-0.42***	0.88***	0.81***	-		
6 Emotional Stability	19.92 ± 11.28	-0.42***	-0.39***	0.31***	0.48***	0.36***	-	
7 Age	21.05 ± 1.71	0.10*	-0.02	0.06	0.01	0.03	-0.03	-

Note. * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$. M = mean, SD = standard deviation

Table 2 Sex differences across variables

Variable	*M* ± *SD*		*t*	*d*
	Female	Male		
Mothers' SES	0.16 ± 1.81	-0.15 ± 1.71	1.81	1.76
Maternal Emotional Warmth	2.91 ± 0.67	2.85 ± 0.66	1.00	0.67
Maternal Punishment	1.58 ± 0.65	1.55 ± 0.58	0.51	0.62
Maternal Overprotection	1.85 ± 0.46	1.80 ± 0.54	0.89	0.43
Maternal Rejection	1.65 ± 0.62	1.65 ± 0.59	0.07	0.62
Emotional Stability	21.48 ± 12.46	18.45 ± 9.83	2.86**	11.18

Note. * $p < 0.05$. ** $p < 0.001$. *** $p < 0.001$. *M* = mean, *SD* = standard deviation

was performed using bootstrapping with a sample size of 5,000 and 95% confidence intervals excluding 0 to indicate a significant parameter.

Results

Common method bias

To exclude possible common methodological biases due to the questionnaire method and single data source, Harman's One-Factor Test was conducted [84]. The outcome revealed that the eigenvalues of all 13 factors were greater than 1 and that the variance explained by the first factor explained was 26.29%, which is less than 40%, indicating that there was no common method bias in this study.

Descriptive statistics and correlation analyses

According to the scoring criteria score, greater than 50 points means poor emotional stability. A total of 9 adolescents reached the level of poor emotional stability, accounting for 2.02%. the 0–20 point levels of emotional stability was the best, and a total of 241 adolescents had good emotional stability, accounting for 54.16%.

The means, standard deviations, and correlations of the measurements of mothers' SES, maternal emotional warmth, maternal punishment, maternal overprotection, maternal rejection and emotional stability are shown in Table 1. The correlations between almost all of the main variables are significant, fulfilling the conditions for conducting a mediation effects analysis.

The independent samples t-test revealed that there were no significant sex differences across maternal parenting styles. While the emotional stability scores of female students were significantly higher than those of male students ($t = 2.86$, $p < 0.01$, $d = 11.18$), and the results are shown in Table 2. However, after the independent samples *t*-test, there were no significant differences in birthplace across maternal parenting styles and emotional stability.

The mediating effect of maternal parenting styles on the relationship between mothers' SES and late adolescents' emotional stability was tested using Model 4 (Simple Mediation Model) of Hayes' PROCESS macro [85].

Mothers' SES was performed as predicting variable, late adolescents' emotional stability was conducted as outcome variable. The results shown in Table 3 indicate that the direct (β= -0.33, $SE = 0.28$, $p < 0.001$), total (β= -0.42, $SE = 0.28$, $p < 0.001$) and indirect (β= -0.10, bootSE = 0.02, bootLLCI = -0.14 and bootULCI = -0.06) effects are significant for maternal emotional warmth. The indirect effect of maternal emotional warmth accounts for 23.81% in the total effect. Regarding to maternal punishment, direct effect is − 0.38, ($SE = 0.27$, $p < 0.001$), total effect is − 0.42 ($SE = 0.28$, $p < 0.001$) and indirect effect is − 0.05 (bootSE = 0.10, bootLLCI = -0.50 and bootULCI =-0.12). The indirect effect of maternal punishment accounts for 11.90% in the total effect. As to maternal overprotection, direct effect was − 0.29 ($SE = 0.27$, $p < 0.001$), total effect is − 0.42, ($SE = 0.28$, $p < 0.001$) and indirect effect is − 0.13 (bootSE = 0.02, bootLLCI = -0.18 and bootULCI = -0.09). The indirect effect of maternal overprotection accounts for 30.95% in the total effect. For the maternal rejection, direct effect is − 0.36 ($SE = 0.27$, $p < 0.001$), total effect is − 0.42, ($SE = 0.28$, $p < 0.001$) and indirect effect is − 0.06, (bootSE = 0.02, bootLLCI = -0.10 and bootULCI = -0.03). The indirect effect of maternal rejection accounts for 14.29% in the total effect. These results indicate that mothers' SES not only associate with late adolescents' emotional stability directly but also associate with emotional stability through maternal emotional warmth, maternal punishment, maternal overprotection, and maternal rejection. Thus, Hypothesis 1 and 2 were supported.

Next, the moderated mediator model was tested using Hayes' PROCESS macro Model 14 (the latter half of the mediator model is moderated), with sex as the moderating variable. The sex variable was virtualized (male = 1,

Table 3 Mediating effects of maternal parenting styles

Pathway	*β*	*SE*	95%*CI*	*R*	R^2	*F*
Mother's SES → emotional stability	-0.33***	0.28	[-2.64, -1.54]	0.42	0.18	96.29***
Mother's SES → Maternal emotional warmth →emotional stability	-0.10	0.02	[-0.14 -0.06]			
Total effect	-0.42***	0.28	[-3.24, -2.16]			
Mother's SES → emotional stability	-0.38***	0.27	[-2.94, -1.87]	0.48	0.23	67.19***
Mother's SES → Maternal punishment →emotional stability	-0.05	1.01	[-0.08, -0.02]			
Total effect	-0.42***	0.28	[-3.24, -2.16]			
Mother's SES → emotional stability	-0.29***	0.27	[-2.40, -1.34]	0.42	0.18	96.29***
Mother's SES → Maternal overprotection → emotional stability	-0.13	0.02	[-0.18, -0.09]			
Total effect	-0.42***	0.28	[-3.24, -2.16]			
Mother's SES → emotional stability	-0.36***	0.27	[-2.82, -1.76]	0.50	0.25	74.47***
Mother's SES → Maternal rejection → emotional stability	-0.06	0.02	[-0.10, -0.03]			
Total effect	-0.42***	0.28	[-3.24, -2.16]			

Note. * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$

Table 4 Mediating effects with moderation

Predictor	*B*	*SE*	95%*CI*	*R*	R^2	*F*
Mother's SES	-2.13***	0.28	[-2.67, -1.58]	0.54	0.29	44.97***
Maternal emotional warmth	-6.93***	1.02	[-8.92, -4.93]			
Sex	-3.98***	0.91	[-5.77, -2.20]			
Maternal emotional warmth × sex	4.46**	1.36	[1.78, 7.13]			
Mother's SES	-2.51***	0.26	[-3.03, -1.99]	0.54	0.29	45.18***
Maternal punishment	7.22***	1.01	[5.24, 9.20]			
Sex	-3.67***	0.91	[-5.46, -1.89]			
Maternal punishment × sex	-6.57***	1.48	[-9.47, -3.66]			
Mother's SES	-2.81***	0.26	[-3.32, -2.29]	0.51	0.26	38.61***
Maternal overprotection	7.77***	1.44	[4.93, 10.60]			
Sex	-3.68***	0.93	[-5.50, -1.85]			
Maternal overprotection × sex	-5.63***	2.16	[-9.88, -1.38]			
Mother's SES	-2.36***	0.26	[-2.88, -1.85]	0.56	0.32	50.93***
Maternal rejection	8.22***	0.99	[6.27, 10.16]			
Sex	-3.73***	0.89	[-5.48, -1.98]			
Maternal rejection × sex	-7.00***	1.43	[-9.82, -4.19]			

Note. * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$

female = 0) to further test the significance of the interaction term.

Results of Table 4 reveal that the product term of maternal emotional warmth and adolescent sex ($B = 4.46$, $SE = 1.36$, $p < 0.01$, LLCI = 1.78, ULCI = 7.13) is significant in predicting emotional stability, $R^2 = 0.29$, $F = 44.97$, $p < 0.001$. The interaction of maternal punishment and adolescent sex is a significant (B = -6.57, $SE = 1.48$, $p < 0.001$, LLCI = -9.47, ULCI = -3.66), $R^2 = 0.54$, $F = 45.18$, $p < 0.001$ in predicting emotional stability. Moreover, the product term of maternal overprotection and adolescent sex (B = -5.63, $SE = 2.16$, $p < 0.001$, LLCI = -9.88, ULCI = -1.38) is significantly associated with emotional stability, $R^2 = 0.51$, $F = 38.61$, $p < 0.001$. Lastly, the interaction of maternal rejection and adolescent sex (B = -7.00, $SE = 1.43$, $p < 0.001$, LLCI = -9.82, ULCI = -4.19) is significant in predicting emotional stability, $R^2 = 0.32$, $F = 50.93$, $p < 0.001$. These results indicate that late adolescent sex moderated the relationships between maternal parenting styles (emotional warmth, punishment, overprotection and rejection) and emotional stability.

Table 5 implies that the mediating effects of maternal styles are significant for female students but not for males. The effects values of maternal emotional warmth, maternal punishment, maternal overprotection, and maternal rejection are – 0.93, -0.05, -0.93, -0.66 respectively, all the 95% confidence intervals excluding 0.

To explain the moderating effect of late adolescent sex, we performed simple slope test. Simple slope analysis (see Fig. 2) reveals that maternal emotional warmth

Table 5 The mediating effects of maternal emotional warmth, maternal punishment, maternal rejection across sex

	Female			Male		
Variables	***β***	**Boot*SE***	**Boot*CI***	***β***	**Boot*SE***	**Boot*CI***
Maternal emotional warmth	-0.93**	0.21	[-1.34, -0.54]	-0.33	0.14	[-0.61, 0.04]
Maternal punishment	-0.05*	0.14	[-0.78, -0.22]	-0.04	0.11	[-0.26, 0.16]
Maternal overprotection	-0.93**	0.20	[-1.33, -0.54]	-0.33	0.14	[-0.61, -0.04]
Maternal rejection	-0.66*	0.16	[-0.99, -0.37]	-0.10	0.11	[-0.33, 0.13]

Note. * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$

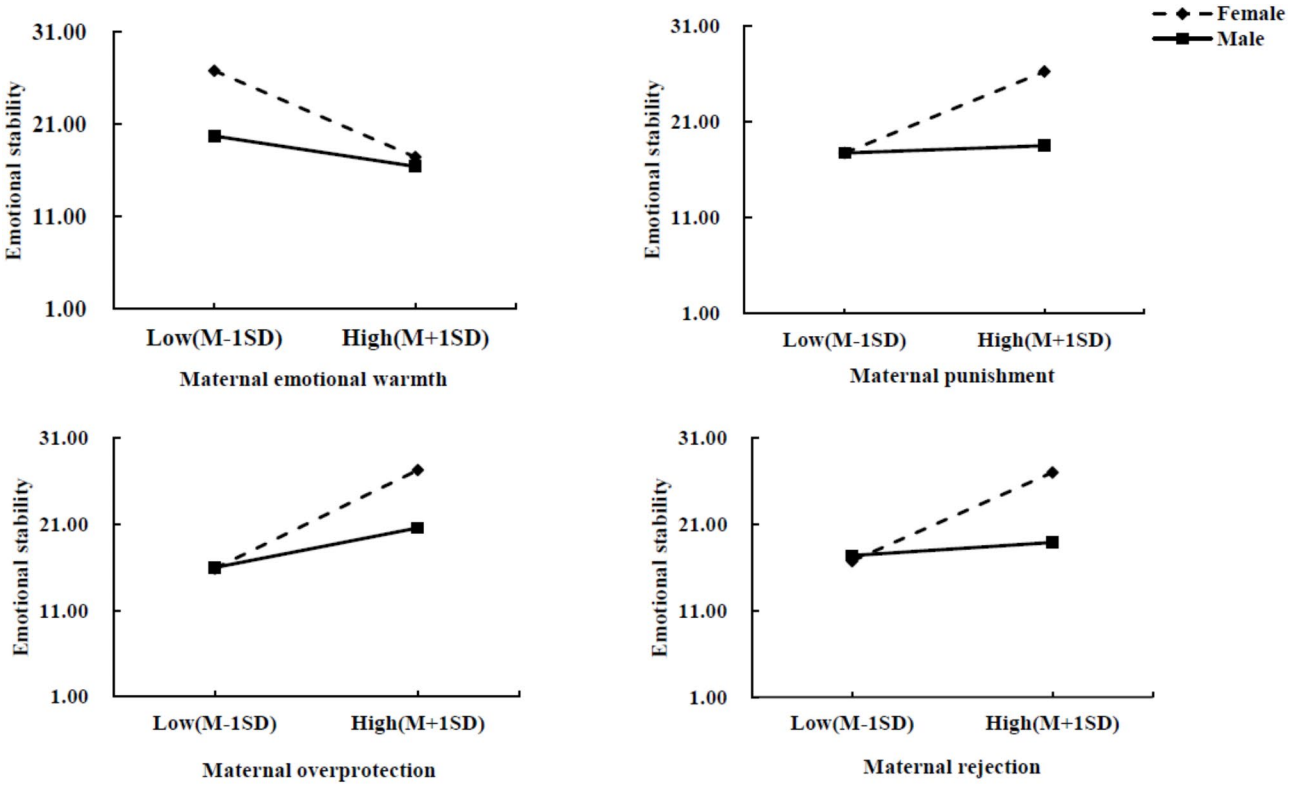

Fig. 2 Moderating effects of maternal parenting styles and sex on emotional stability

significantly predicted emotional stability not only for female adolescents (β = -6.93, $SE = 1.02$, t = -6.82, $p < 0.001$), with 95% confidence intervals of [-8.92, -4.93], but also for male adolescents (β = -2.47, $SE = 0.98$, $t = 2.53$, and $p < 0.05$) with a 95% confidence interval of [-4.39, -0.55]. While the association between maternal emotional warmth and emotional stability in female adolescents are stronger than male adolescents.

Figure 2 shows that maternal punishment significantly associated with emotional stability in female adolescents ($\beta = 7.22$, $SE = 1.01$, $t = 7.17$, $p < 0.001$) with a 95% confidence interval of [5.24, 9.20]. However, maternal punishment was not significantly related with male students' emotional stability ($\beta = 0.65$, $SE = 1.10$, $t = 0.59$, $p > 0.05$), with a 95% confidence interval of [-1.52, 2.82]. That is, maternal punishment negatively associates with female students' emotional stability, and the higher the levels of female students' perceived punishment from their mothers are, the lower levels of their emotional stability are.

As shown in Fig. 2, maternal overprotection significantly associated with emotional stability in female adolescents ($\beta = 9.78$, $SE = 1.03$, t = 9.51, $p < 0.001$, 95% confidence interval [7.76, 11.81]. Maternal overprotection significantly associated with emotional stability in male adolescents ($\beta = 3.94$, $SE = 1.15$, $t = 3.43$, $p < 0.001$; 95% confidence interval [1.68, 6.20]). That is, maternal overprotection was negatively related to emotional stability for both female and male adolescents. However, the effect in female adolescents is greater than in male adolescents.

Figure 2 also shows that maternal rejection significantly associated with emotional stability in female adolescents ($\beta = 8.22$, $SE = 0.99$, $t = 8.31$, $p < 0.001$, 95% confidence interval [6.27, 10.16]), while maternal rejection did not associate with emotional stability in male adolescents

($\beta = 1.21$, $SE = 1.06$, $t = 1.14$, $p > 0.05$, 95% confidence interval [-0.87, 3.30]. That is, maternal rejection may be detrimental to the emotional stability of female students, and the higher the levels of maternal rejection are, the lower levels of the emotional stability in female students are.

Discussion

The present study examined the relationship between mothers' SES and late adolescents' emotional stability. The results revealed that mothers' SES not only significantly associated with emotional stability but also may predict emotional stability through maternal parenting styles. Moreover, this process differed between female and male adolescents. These findings support the hypotheses proposed in this study.

Characteristics of emotional stability in late adolescents

The results showed that the percentage of individuals with the best level of emotional stability was 54.16%; and the percentage of individuals with emotional instability among late adolescents was 2.02%. This indicated that the emotional stability of late adolescents developed well in China. In terms of sex, the current study showed that female adolescents are less emotionally stable than male adolescents. For one, changes in hormone levels during a women's physiological cycle may cause her mood to fluctuate. Additionally, female adolescents have stronger emotional memory capacity and susceptibility to negative emotions [86]. This could make it more difficult for female adolescents to develop greater emotional stability.

The relationship between mothers' SES and late adolescents' emotional stability

This study supported the direct effect of mothers' SES on late adolescents' emotional stability. This finding provided evidence to previous findings [20, 22]. Resource conservation theory states that a lack of resources increases an individual's risk of failing to cope with stress [23]. Resource-poor people are stress-susceptible and are more likely to suffer from chronic severe stress. Hobfoll also suggested that individuals are driven by resource preservation, and will increase their resource stores by investing in resources to cope with possible future loss of resources, even in stress-free situations [23]. In other words, the more resources an individual possesses, the more he or she is able to cope positively with stress, eliminate psychological tension, and be more emotionally stable. Economic income, education and knowledge in the family are important ways for individuals to acquire resources [23]. A mother's high income and high level of education will also become a resource for the offspring themselves. In this way, adolescents will be able to cope effectively with stress, will be less sensitive and volatile, and will gradually develop personality trait of emotional stability. In addition, this study revealed that, even after maternal parenting styles being included as a mediating variable, the direct relationship between mothers' SES and the emotional stability of late adolescents was still significant. This suggests that the role of mothers' SES cannot be ignored. It is essential to consider different family contexts when developing intervention programs for late adolescents' emotional stability.

The mediating role of maternal parenting styles

The present study further found that maternal parenting styles (emotional warmth, punishment, overprotection, and rejection) significantly mediated the link between maternal SES and college students' emotional stability. This echoes the Family Stress Model [87]. The mediating role of parental styles in the linkage between SES and personality traits was also observed in a previous study [88]. At first, the higher mothers' SES is, the higher maternal emotional warmth, and the lower maternal punishment, overprotection and rejection. These findings were similar to those of other studies [52, 89]. As the Family Stress Model indicated, if a mother had a high level of income, she would be not worried about her financial status and few bad moods, in turn, marital satisfactory may increase [19]. According to the spillover hypothesis, positive emotions may spill over into parenting behaviors and parent-child interactions [90]. This might make mothers more inclined to engage in positive parenting styles (emotional warmth). Conversely, poor and less educated mothers tend to exhibit negative parenting behaviors such as punishment, overprotection or rejection.

Individuals who live in a peaceful and supportive household are more hopeful and trusting of others [91, 92]. Children raised by strict, controlling parents are desperate, worried, and insecure [37]. Several studies have reported that parental emotional warmth is positively associated with emotional stability [89], yet parental punishment or rejection has a negative effect on emotional stability [93, 94]. The results in this study goes on line with these findings. This could be explained under the framework of attachment theory [33]. On one hand, if parents provide their children with a secure and warm bond while encouraging independence rather than controlling the child. The child may develop a secure attachment and grow up to be confident, trusting towards others and emotionally stable. On the other hand, harsh controlling parents appear, which may lead to children's anxious attachment style. The trait of low emotional stability, characterized by anxiety, impatience, timidity, and dependence, may be an indication of anxious attachment [34, 95]. Moreover, self-determination theory provides theoretical support for this phenomenon. Self-determination theory suggests that individuals naturally have basic psychological needs including competence,

autonomy, and relatedness [61]. If these fundamental psychological needs are not addressed, a series of mental health problems can arise. Mothers' warmth satisfies the individuals' need for competence autonomy, and relatedness in adolescents [96], thus favoring personality development and better emotional stability. At the same time, maternal emotional warmth creates a safe and warm family atmosphere in which children can express their emotions openly. This may promote the development of greater emotional stability. However, mothers' overprotection, punishment and rejection do not satisfy individuals' need for autonomy and relatedness, invading the child's psychological world and causing the child to have negative emotional experiences such as depression and anxiety [97, 98]. In the long run, unstable emotional traits may emerge.

In sum, mothers with a high SES are less likely to be distressed by economic pressures and are prone to invest emotional resources such as emotional warmth to their children. In turn, maternal warmth may foster safe attachment and satisfy adolescent basic psychological needs, promoting adolescent positive psychological traits such as emotional stability [33, 61, 88]. On the contrary, in poor families, economic stress may cause moms to become emotionally disturbed, which may lead to mothers struggling to care adolescents and being more likely to perform negative parenting styles (for example, punishment, overprotection, and rejection). Harsh parental control may constantly threaten the adolescents' basic psychological requirements, leading to anxious attachments. It is not conducive to the development of positive personality traits in adolescents. These adolescents are more prone to experience low self-esteem, high levels of stress and emotional instability [33, 61, 88]. The findings of the present study indicated that the total, direct, and indirect effects were all significant, confirming the partial mediating effect of maternal parenting styles on the relationship between mothers' SES and late adolescents' emotional stability.

According to the value of the mediating effect, maternal overprotection and emotional warmth made greater contributions, accounting for 30.95% and 23.81% in the total effects, respectively. The results highlight the crucial implications of excessively intrusive, controlling, and warm parenting styles in the development of personality traits in adolescents. Therefore, mothers need to be rational in adopting appropriate parenting styles.

The moderating effect of sex

The results of this study showed that adolescents' sex played a moderating role in the latter half of the mediation model. That is, female college students were more affected by their mothers' emotional warmth and overprotection than male students were, and only female students' emotional stability was affected by their mothers' punishment and rejection. However, regarding the indirect effects, mothers' SES could associate with late adolescents' emotional stability through maternal parenting styles (emotional warmth, punishment, overprotection and rejection) only in female adolescents. In other words, this study revealed that mothers may have a stronger effect on daughters than on sons. The results of this study showed that there was no sex difference in mothers' parenting styles. Mothers did not treat their daughters or sons differently. However, the effects of maternal parenting style on late adolescents' emotional stability may be various according to the sex of adolescents.

Other studies have identified that mothers had a greater influence on female adolescents compared to males. For example, Van Lissa reported that mother care benefited females' emotion regulation but not males' [45]. Parenting behaviors have a greater impact on same-sex children [45, 66]. According to social learning theory, same-sex parents play a more important role in the development of their children [67]. Mother-daughter relationships are the closest [99]. Female adolescents are more likely to imitate and internalize what their mothers say and do. As a result, when the mother always shows emotional warmth and understanding, the female adolescent is more likely to feel approved, cared for and they learned to be warmful and trusting, and is less likely to experience large emotional ups and downs. Female students may acquire their mothers' positive way of viewing problems and develop stable emotionality.

Moreover, in the process of individual socialization, influenced by sex stereotypes and sex role expectations, the males are encouraged from an early age to be independent and assertive, while the females are taught to be submissive, cooperative, and dependent [100]. Sex role expectations encourage female adolescents to value relationships and emotional experiences. It was claimed that female adolescents were more sensitive to the affective family environment. Female adolescents are more likely to experience negative affect within family contexts than males adolescents are [101]. These factors may improve the sensitivity of female adolescents to parenting, which would have greater effects on them. When mothers consistently display negative parenting actions such as punishment, overprotection and rejection, female adolescents may be more likely to experience negative emotions than male adolescents [102]. Emotional fluctuations may occur as a result of the mother's words and actions, making it difficult to develop emotional stability.

Implications

These findings may yield several significant implications. First, late adolescents' emotional stability was focused on and it deepened the understanding of personality during

adolescence. This developed the knowledge in this area. Second, the current study contributes to filling research gaps in China on the moderating impact of sex in the relationship between maternal parenting styles and late adolescent emotional stability. This also provides crucial practical implications for identification, prevention, and intervention efforts which may be carried out differently for female and male adolescents. Third, this study considered socioeconomic diversity, not only low-income families in some studies [78]. A broader range of SES could promote maternal interventions that are more specific to the target mothers. Fourth, the outcomes of this study may also provide some suggestions for parenting of mothers. The higher the mothers' income and education level are, the more likely they are to exhibit positive parenting styles, which in turn contribute to the healthy development of their children. As such, contemporary mothers need to develop themselves instead of sacrificing themselves for their children. Additionally, mothers may avoid using negative parenting styles as much as possible, particularly while raising their daughters. During late adolescence, mothers continue to play a key role in adolescents' personality shaping. Therefore, encouraging mothers to take part in parenting interventions is helpful to decrease their negative parenting practices such as overprotection and rejection. For family workers and mental health providers, current research findings also highlight the need of training for parents. Interventions for mothers' parenting styles should focus on modifying risk factors, such as the continuing pursuit of self-growth, which may reduce poor parenting styles and approaches to improve the emotional stability of late adolescents, especially female adolescents.

Limitations and future directions

Despite these potential advantages, this study still has some limitations that must be acknowledged. First, this study focused only on mothers. Studies indicated that fathers' SES and parenting behaviors were equally important [47]. Other studies even shown that fathers had unique effects on adolescent boys [103]. Future research is needed to explore further mechanisms by which fathers influence their children's emotional stability and compare the difference between fathers and mothers. Second, the study only selected a small sample from a university town located in Shandong Province, China. The generalizability of the findings is limited. Future works need to expand the sample representation by using random sampling from various locations. Third, this was only a cross-sectional study, which cannot exactly describe the causal relationships between variables. In the future, studies should consider longitudinal or experimental methods to precisely describe the relationships between variables. Finally, the process of this study relied on self-reports from the respondents which may cause measurement bias. For future studies, attempts should be made to use parents-reporting, observation and/or interviews to improve the reliability and validity of the study, which may offer new insights into this topic.

Conclusions

This study invited 445 late adolescents to complete an online survey in Shandong province, China. Results revealed that current late adolescents may have middle and high levels of emotional stability. Mothers' SES may associate with late adolescents' emotional stability. While maternal emotional warmth, punishment, overprotection, and rejection may play mediating roles in the relationships between mothers' SES and late adolescents' emotional stability. However, maternal parenting styles may have greater effects on the emotional stability in female late adolescents than male adolescents. These findings provide crucial practical implications for identification, prevention, and intervention efforts in late adolescents' emotional stability, which may be carried out differently for female and male adolescents.

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Author contributions

Conceptualization: Xiao-Yan Xu and Lu-Yao Gao; Data Collection: Lu-Yao Gao; Data Management: Xiao-Yan Xu. Writing—original draft preparation: Xiao-Yan Xu; Writing—review and editing: Xiao-Yan Xu and Zahyah Hanafi; Supervision: Xiao-Yan Xu and Zahyah Hanafi.

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Data availability

The data are available from the authors; however, they are not publicly available. Interested researchers may contact the corresponding author for access to the datasets.

Declarations

Ethical approval and consent to participate

This study was conducted in accordance with the Declaration of Helsinki. Approval to conduct the study was obtained from the ethics committee of the School of Education, Shandong Women's University. Informed consent was obtained from all participants.

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Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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