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EMPIRICAL RESEARCH

Parent and Friend Emotion Socialization in Early Adolescence: Their Unique and Interactive Contributions to Emotion Regulation Ability

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Abstract

During early adolescence, parental influence diminishes, whereas friends' influence increases in shaping emotion regulation abilities. However, it is unclear how parents and friends jointly contribute to emotion regulation abilities and how their joint effects vary by gender. This study examines fathers, mothers, and friends as simultaneous emotional socializers and considers the young adolescents' gender. The analysis drew on 438 young Chinese adolescents (55.7% girls, Mage = 11.39, SD = 1.28) who participated in a longitudinal survey over one year. Results showed that parental and friend emotion socialization have both distinct and joint effects. Friends' responses provided a unique contribution to emotion regulation abilities across gender, whereas parents' responses displayed unique contributions among girls. In predicting girls' emotion regulation abilities, mothers' supportive responses explained the additional variance beyond friends' responses, whereas fathers' unsupportive responses moderated the predictive power of friends' responses. These findings clarify emotion-related socialization theories and emphasize the importance of gender specific prevention programs focusing on emotion socialization from both parents and friends in early adolescence.

Keywords Parent emotion socialization · Peer emotion socialization · Emotion regulation ability · Gender difference · Young adolescents

Introduction

Emotion regulation ability, the ability to effectively regulate and manage emotions, is crucial for youth's socio-emotional competence and adjustment (Compas et al., 2017; Schäfer et al., 2017). During early adolescence, emotion regulation development is paramount, as individuals must acquire diverse and flexible strategies to cope effectively with the approaching or existing emotional challenges of puberty (Casey et al., 2010). Research has shown that emotion regulation abilities increase with age during early adolescence (Wang et al., 2021), and this period is highly influenced by parents' and friends' emotion socialization (Eisenberg, 2020). However, prior research has primarily examined the effects of parents and friends separately (Miller-Slough & Dunsmore, 2016, for a review), leaving their joint effects on young adolescents' emotion regulation abilities largely unknown. This study extends the existing research by examining how parents' and friends' responses to negative emotions jointly affect the emotion regulation abilities of young adolescents (aged 10–14 years), including friends' and parents' unique and interactive contributions. Given the gendered world of emotional development (Brown et al., 2015), this study explores gender differences in the combined effects of friends and parents on emotion regulation abilities.

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Emotion Socialization Theories

Emotion-related socialization theories suggest that socialization agents such as parents and friends play a critical role in shaping teenagers' emotion-related skills (Eisenberg, 2020; Zeman et al., 2013). Youth acquire emotion-related skills primarily through three means: modeling, emotional climate, and emotion socialization practices (Morris et al., 2007). Modeling involves observing and imitating the emotional displays of parents and friends. The emotional climate, exemplified by relationship quality, helps regulate how youth learn emotions by influencing their emotional security. Emotion socialization practices such as how parents and friends respond to youth's emotional displays entail targeted behaviors in which parents and friends provide immediate and specific feedback on the acceptability, causes, and regulation strategies of emotions. This study specifically focused on the effects of responding to youth's emotional displays for three key reasons: First, the responses of parents and friends provide a direct pathway for socialization. Their immediate and specific responses help youth directly learn expressive norms and acquire emotion regulation strategies applicable to specific social contexts. Second, appropriate responses can be provided operationally to parents and friends. Research on this topic could directly inform and guide practical activities. Finally, few studies examine how parents' and friends' responses to emotions affect youth emotion regulation abilities during early adolescence (Hale et al., 2023).

Parents' and friends' responses to negative emotions are typically categorized as supportive or unsupportive and may promote or inhibit youth's emotion regulation development (Klimes-Dougan et al., 2014; O'Neal & Magai, 2005). Supportive responses (such as reward and overriding) are protective factors for young adolescents' emotion regulation abilities, as they can help youth accept their own negative emotions and learn adaptive strategies to regulate emotions (Borowski et al., 2018; Morelen & Suveg, 2012). For example, a reward serves to validate and encourage emotional expression by recognizing adolescents' negative emotions and discussing their causes, meaning and consequences. Additionally, overriding assists adolescents in alleviating distress by redirecting attention away from negative emotions without focusing excessively on them (Miller-Slough & Dunsmore, 2016). In contrast, unsupportive responses (such as neglect, punishment, and magnification) are risk factors for adolescents' emotion regulation abilities, as they may discourage negative emotion expression and promote the internalization of maladaptive emotion regulation strategies (Buckholdt et al., 2014; Miller-Slough & Dunsmore, 2016). For example, neglect and punishment may indicate that negative emotions are unacceptable and should not be expressed. Magnification can exacerbate negative emotions and limit opportunities for adolescents to learn effective emotion management strategies (Moed et al., 2015). Supportive and unsupportive responses are not mutually exclusive, as parents and friends can exhibit high levels of both response types. Thus, both supportive and unsupportive responses contribute to emotion regulation abilities and are necessary to understand how emotions are socialized in early adolescence (Cui et al., 2020; Dunsmore et al., 2013).

Unique Effects of Parents and Friends on Young Adolescents' Emotion Regulation

Previous research on emotion socialization has concentrated on the family context (Morris et al., 2007; Zeman et al., 2013) because of the abundance of parent-child interactions during early childhood. However, important contextual factors may change as children move into early adolescence (Lerner, 2002, 2011). During this period, friendships become particularly salient and influential, leading to an increase on research on emotion socialization among friends (Miller-Slough & Dunsmore, 2016). Compared to parent-child relationships, friendships are characterized by similar levels of social power, shared social experiences, and less stability, which requires more effort for its maintenance. Friendships also promote intimacy and belongingness (Allen, 2008), which tend to increase young adolescents' emotional disclosure to friends (Bukowski et al., 2007). Therefore, beyond the role of parents, friends seem also to exert an important influence on young adolescents' emotional development.

To date, two studies have investigated the responses of parents and friends simultaneously. However, they analyzed the effects of parents and friends separately and obtained inconsistent results (Cui et al., 2020; Miller-Slough & Dunsmore, 2016). Specifically, one study that sampled 84 adolescents (aged 13–15 years) found that friends' punishment was associated with decreased emotion regulation over time, while parents' punishment was unexpectedly associated with increased emotion regulation over time (Miller-Slough & Dunsmore, 2016). Another study with 160 adolescent girls (mostly aged between 12 and 15 years) from low-income backgrounds found that friends' responses (both supportive and unsupportive) were not associated with young adolescents' emotion regulation, while supportive maternal responses positively predicted emotion regulation two years later (Cui et al., 2020). The relatively small and heterogeneous samples in these two studies may explain these contradictory and unexpected results. More importantly, neither of them analyzed parents' or friends' responses using the same model, leaving their unique effects unknown.

A recent study examined parents' and friends' emotion socialization practices simultaneously among 209 young adolescents aged 10 to 16 years ($M_{age} = 12.66$). They found that friends' reward, overriding, and punishment provided incremental predictive power in explaining young adolescents' anger regulation beyond parents' responses, whereas among parental responses, only magnification provided incremental predictive power beyond friends' responses (Hale et al., 2023). However, this study did not distinguish between the influence of fathers and mothers. Moreover, different informants were used when measuring parents' (parent-reported) and friends' (adolescent-reported) responses, making it difficult to compare the influence of parents and friends. To clarify the relative effects of different socialization agents, this study measured the responses of fathers, mothers, and friends through adolescent reports. As prior literature has shown that parents still matter in early adolescence (Butterfield et al., 2021), this study expects that both parents' and friends' responses would provide unique contributions to young adolescents' emotion regulation abilities.

The Interactive Effect of Parents and Friends

In addition to these unique contributions, how parental and friend emotion socialization interactively contributes to emotion regulation abilities in early adolescence is also a core question. Developmental contextualism holds that multiple contexts are dynamic and can interact with one another (Lerner, 2002, 2011). From this perspective, the effect of emotion socialization in one context (e.g., the peer context) on individuals' emotional development may be affected by emotion socialization in another environment (e.g., the family context). The effects of parents' and friends' emotion socialization on young adolescents' emotional development may be interactive. Empirical research on the interactive effects of parental and friend responses on negative emotions in youth is limited (Eisenberg, 2020). Nevertheless, the literature on the interactions between different attachment figures may provide insights to this issue, given that attachment relationships are another important component of emotion socialization (Morris et al., 2007).

Previous research proposed two interactive patterns between parent-child attachment and peer attachment. One is the buffering pattern, which means that good friendships can compensate for the negative effect of poor parent-child relationships on adolescents' emotional development (e.g., internalizing problems and well-being) and vice versa (Zhao et al., 2015; Schacter & Margolin, 2019). The second is a synergistic pattern, which means that children can achieve optimal emotional development when they establish good attachment relationships with both parents and peers (Sentse & Laird, 2010; Wang et al., 2019). For example, Sentse and Laird (2010) found that low friendship conflict undermined the risk of parent-child conflict in promoting adolescents' antisocial behaviors, which was consistent with the buffering effect model. Their study also indicated that the role of parental support in reducing adolescents' depressive mood was significant only when friendship support was high, which supports a synergistic pattern. Given that buffering and synergistic patterns of interactions are both plausible, this study assumes that interaction effects between parents' and friends' responses to young adolescents' negative emotions on their emotion regulation abilities are significant but does not make specific assumptions about the pattern of the interactive effects.

The Effects of Parents and Friends May Differ Based on Adolescent Gender

The effects of parents and friends may vary depending on young adolescent gender. Regarding their separate effects, parents may have a greater influence on girls than boys. According to gender-differentiated emotional display rules, girls are allowed to be more emotionally expressive than boys in many societies (Chaplin & Aldao, 2013). As a result, girls are more willing than boys to express emotions toward parents, which provides more opportunities for parents to shape emotional development (Aldrich & Tenenbaum, 2006). Moreover, girls may be more sensitive than boys to parents' reactions (Assary et al., 2021). They benefit more from supportive parental responses and experience greater negative effects from unsupportive parental responses (Perry et al., 2017; Yap et al., 2008). From this perspective, girls' emotion regulation abilities might rely more on parents' responses than boys'. Based on this, this study assumes that parents' responses are more important for girls' than for boys' emotion regulation abilities.

In contrast to the gender-differentiated effects of parents' responses, the impact of friends' responses on young adolescents' emotion regulation abilities may be similar across the gender. Few studies have explored the moderating role of gender in the effects of friends' responses, and most did not find significant gender differences (Hale et al., 2023; Parr et al., 2016). Therefore, this study assumes that friends' responses have comparable effects on both girls and boys.

Regarding the interactive effects between parents' and friends' responses, this study claims that the interactive effects may differ between boys and girls but does not make specific assumptions due to its complexity. First, as mentioned earlier, the interactions between parents' and friends' responses encompassed multiple possibilities, making it difficult to hypothesize a specific pattern. Furthermore, guided by gender-differentiated socialization, fathers and mothers may affect offspring differently (Brand & Klimes-Dugan, 2010; Brown et al., 2015). For example, supportive maternal responses relate to adolescent emotion regulation

skills, whereas unsupportive paternal responses relate to adolescent emotion regulation difficulties (Hurrell et al., 2015). Gender differences may be more complex when considering the distinct effects of fathers and mothers on young adolescent emotion regulation abilities. Therefore, considering rationality, this study would differentiate the responses of fathers and mothers, and explore whether the unique and interactive effects of mothers/fathers and friends on young adolescent emotion regulation abilities vary by young adolescent gender. However, given these complex possibilities, no specific hypothesis has been proposed about this interaction. Clarifying the potential interaction patterns between parent and friend emotion socialization without a predetermined hypothesis is needed.

Current Study

As children transition into early adolescence, the agent of emotion socialization extends from parents to friends. However, how parents and friends jointly affect emotion regulation abilities and how their joint effects vary by gender in this period is unclear. Therefore, this study aimed to examine the joint effects of parents' and friends' responses to young adolescents' negative emotions on their emotion regulation abilities using a one-year follow-up design. It extends previous research by examining the unique contribution of parents and friends and their interactive contributions to the change in young adolescents' emotion regulation abilities. In addition, this study aimed to examine whether and how the effects of parents' and friends' responses vary according to young adolescent gender. Based on emotion-related socialization theories and empirical findings in the field, four hypotheses were proposed. First, supportive/unsupportive responses from fathers, mothers, and friends were expected to be positively/negatively correlated with changes in emotion regulation abilities during early adolescence (Hypothesis 1). Second, parents' and friends' responses, both supportive and unsupportive, would explain the unique variations in emotion regulation abilities over and above each other (Hypothesis 2). Third, there would be significant interactive effects between fathers'/mothers' and friends' responses to emotion regulation abilities during early adolescence (Hypothesis 3). The interactions may follow a buffering pattern in which highly supportive (or low unsupportive) responses from friends may compensate for the development of emotion regulation abilities when responses from fathers/mothers are low supportive (or highly unsupportive). Alternatively, the interactions may follow a synergistic pattern in which highly supportive (or low unsupportive) responses from friends could predict emotion regulation abilities when responses from fathers/mothers are highly supportive (or low unsupportive). Finally, the main and interaction effects mentioned above would differ by young adolescent gender (Hypothesis 4). Given the various possibilities, this study only assumes that parents' responses would have a greater impact on girls' emotion regulation abilities. No specific patterns of gender differences in the other effects were assumed.

Methods

Participants

A total of 450 participants were recruited from a public elementary school and junior middle school in Zhejiang, China. Data from 12 participants were excluded because they did not complete the investigation of any of the main study variables. Thus, 438 (55.7% girls) valid participants remained as an initial sample (T1), aged between 10 and 14 years ($M = 11.39$, $SD = 1.28$). They were from fourth Grade ($N = 173$, $M_{age} = 10.22$ years, $SD = 0.34$), fifth Grade ($N = 145$, $M_{age} = 11.22$ years, $SD = 0.30$), and seventh Grade ($N = 120$, $M_{age} = 13.28$ years, $SD = 0.29$). Of the initial sample, 94.98% (N = 416) also participated in the investigation one year later (T2).

Participants reported the type of registered permanent residence and parents' education level at Time 1. A total of 85.2% of young adolescents were born in urban areas and 10.5% in rural areas; the remaining 4.3% did not answer this question. Parents' educational level was divided into four levels: 1 = below junior high school (father: 25.1%; mother: 23.3%), 2 = high school (father: 32.0%; mother: 30.1%), 3 = bachelor's degree (father: 35.4%; mother: 38.1%), and 4 = graduate (father: 2.3%; mother: 2.7%). Education levels of the remaining fathers (5.3%) and mothers (5.7%) were missing. The type of registered permanent residence and parental education level were excluded from the final analysis presented in this article, as the former was only correlated with emotion regulation abilities at T1 ($r = 0.151$, $p = 0.002$), but not at T2 ($r = 0.022$, $p = 0.655$), and the latter was not correlated with emotion regulation abilities at both measurement times ($r = 0.029$–0.084, $ps > 0.05$).

Measures

Parents' responses to negative emotions

The adapted Emotional as a Child Scale (EAC, Magai, 1996) was used to assess parental responses to the child's negative emotions at T1. The EAC has 15 items, including six supportive responses such as reward (e.g., "ask me about what made me unhappy") and overriding (e.g., "tell me not to

worry"), and nine unsupportive responses like magnification (e.g., "express that he/she feels the same as me"), neglect (e.g., "ignore the fact that I feel unhappy") and punishment (e.g., "tell me that I am acting younger than my age"). The EAC is composed of three subscales that measure parental responses to children's emotions: anger, sadness, and worry. The scores of each response strategy across discrete emotions were similar and often averaged as a composite index in previous studies (McCord & Raval, 2016; Miller-Slough & Dunsmore, 2019). Therefore, this study did not distinguish between specific negative emotions to reduce the burden on participants. Instead, this study combined the three subscales into one and asked participants, "You experienced something terrible, and you are not happy (e.g., angry, sad, worried). If your parents know that you are unhappy and are with you, how will they respond?" Participants were asked to report their perception on a five-point scale (1 = *never*, 5 = *always*). The average scores for supportive and unsupportive response items were calculated for the analysis, and therefore could vary from 1 to 5.

Before the main study, a pilot study was conducted with another sample with 534 adolescents ($M_{age} = 12.71$ years, $SD = 0.62$) to test the construct validity of the scale. The participants reported how their parents responded to their negative emotions. Parallel analysis supported a two-factor solution, consistent with prior indigenous research (Luo et al., 2020). Furthermore, an exploratory factor analysis (EFA) was conducted. Referring to the criteria that the Root Mean Square Error of Approximation (RMSEA) should be less than 0.08, and the Comparative Fit Index (CFI) and the Tucker-Lewis Index (TLI) should be above 0.90 (Hu & Bentler, 1999), the fit indices of the two-factor model in EFA were qualified ($\chi^2(76) = 216.203$, $p < 0.001$, RMSEA = 0.064, CFI = 0.941, TLI = 0.919). As expected, six supportive items were divided into one factor and nine unsupportive items were divided into another. In the main study, confirmatory factor analysis (CFA) showed that the two-factor models for both fathers ($\chi^2(89) = 172.087$, $p < 0.001$, RMSEA = 0.046, CFI = 0.950, TLI = 0.941) and mothers ($\chi^2(89) = 210.524$, $p < 0.001$, RMSEA = 0.056, CFI = 0.924, TLI = 0.911) were acceptable and factor loadings varied from 0.312 to 0.754 for all items. Cronbach's alphas for the supportive dimension were $\alpha = 0.813$ for fathers and $\alpha = 0.789$ for mothers, those for the unsupportive dimension were $\alpha = 0.802$ for fathers and $\alpha = 0.807$ for mothers.

Friends' responses to negative emotions

The You and Your Friend Questionnaire (YYF) was used to assess best friends' responses to individuals' negative emotions at T1. The YYF scale was developed in a previous study based on the EAC (Klimes-Dougan et al., 2014). It has 15 items, including five response strategies that can be divided into supportive (six items) and unsupportive (nine items) responses, similar to the EAC. The items of the YYF correspond one-to-one with the EAC, but the statements are more suitable for peer situations. Similarly, the three subscales (anger, sadness, and worry) were combined into one scale. Participants responded on a five-point scale (1 = *never* and 5 = *always*). The average scores of the supportive and unsupportive response items were used in the analysis and could vary from 1 to 5.

The 534 participants in the pilot study also reported how their best friends responded to their negative emotions. The parallel analysis and EFA both supported the two-factor solution, $\chi^2(76) = 218.595$, $p < 0.001$, RMSEA = 0.064, CFI = 0.933, TLI = 0.907. In the main study, CFA also supported the two-factor structure of the YYF: $\chi^2(89) = 245.453$, $p < 0.001$, RMSEA = 0.064, CFI = 0.914, and TLI = 0.897. The factor loadings of all items varied from 0.284 to 0.831. Cronbach's alphas for the supportive and unsupportive dimensions were 0.831 and 0.773, respectively.

Emotion regulation ability

The emotion regulation subtest of the Emotional Intelligence Test for adolescents (A-EIT, Wang et al., 2021) was used to assess emotion regulation abilities at both T1 and T2. This subtest consists of 13 items, each comprising a situation with an emotional goal and four strategic options. These situations describe salient emotional events that occur to adolescent parents, teachers, peers, or themselves. Participants were asked to select the best and worst options to achieve an emotional goal. For example, "Wanghong quarreled with her deskmate in public because of a small matter. She felt pretty angry. What action would be most effective in sensibly helping her calm down and resolve the conflict? What action would be the least effective?" Regarding scoring, both the best and worst strategy selections adopted 0–1–2 points: 0 points for unreasonable options, 1 point for possibly reasonable options, and 2 points for plainly reasonable options. The points for the best and worst strategies were averaged as the scores for each item. Thus, the score for each item ranges from 0 to 2. Higher scores indicate a higher level of emotion regulation ability. Cronbach's alpha for the emotion regulation abilities was 0.765 at T1 and 0.802 at T2.

Procedure

This study was approved by the Ethics Committee of the First Author's Institute. Written informed consent was obtained from all students and their parents through the school teacher. At T1, participants completed the test to assess emotion regulation abilities and reported their parents' and friends' responses to negative emotions. At T2,

participants completed the emotion regulation ability test only. All measurements were administered to the students by the first author and postgraduate students in psychology. It took approximately 35 min for students to complete T1 and approximately 20 min for T2. To compensate for participating in the survey, students received small gifts at each measurement time point and individual feedback on the survey results in the third month following the completion of the second survey.

Analytic Plan

Three steps were used to explore the unique and interactive effects of parental and friend responses to negative emotions on emotion regulation abilities during early adolescence. First, repeated-measures analysis of variance (ANOVA) was conducted to explore the developmental characteristics of the study variables. Second, partial correlations with emotion regulation abilities at T1 and young adolescent age as covariates were conducted to describe the separate links between the responses from each agent of emotion socialization (parents and friends) and emotion regulation abilities at T2 (testing Hypothesis 1). To examine the unique contributions of parents and friends to changes in emotion regulation abilities, the present study performed four multiple regression models with emotion regulation abilities at T2 as the dependent variable. For Model 1, only emotion regulation abilities at T1, young adolescent age and gender were considered. Models 2 to 4 sequentially added the main effects of mothers, fathers, and friends based on Model 1 (testing Hypothesis 2).

Five points need to be noted concerning testing interaction effects (Hypotheses 3 and 4). First, this study did not examine the interactions between fathers and mothers for two reasons. The primary focus of this study was to investigate how emotion socialization in the family context interacts with that in the peer context, rather than examining the interaction between fathers and mothers within the family context. Additionally, the high correlations between fathers' and mothers' responses (r is approximately 0.7 in this study) may cause multicollinearity (the values of variance inflation factor would be greater than the critical value of 5, Belsley, 1991) if their interaction terms were included.

Second, referring to prior literature (McElwain et al., 2007), the current study focused on interaction terms created by the same response dimensions (e.g., father support × friend support). The results concerning the interactions between different response dimensions (e.g., father nonsupport × friend support) are reported in the supplemental analyses. Third, even when focusing only on interactions between the same response dimensions, there are four triple-interaction terms and 10 double-interaction terms. These excessive interaction terms may increase type I errors by increasing the overall number of model parameters (Gelman & Hill, 2007). Hence, to reduce the type I error, Models 5 to 8 were established by adding only one triple interaction term and its corresponding three double interaction terms to Model 4. For instance, Model 5 included two control variables, seven independent variables, three double interaction terms (father support × friend support, father support × gender, friend support × gender), and one triple interaction term (father support × friend support × gender). Fourth, Model 9, with the control variables, main effects, and significant interaction terms included in Models 1–8, was established as the final model. Finally, each interaction term was created by standardizing and multiplying the corresponding independent variables.

The multiple regression models mentioned above were examined using robust maximum likelihood estimation (MLR) in *Mplus 8* (Muthén & Muthén, 1998–2017). Missing data were addressed using the information maximum likelihood (FIML), which maximizes the use of available data and produces unbiased estimates (Enders & Bandalos, 2001).

Results

Descriptive Results

Table 1 presents the means and standard deviations of the study variables. Three repeated-measures ANOVAs were conducted to examine the developmental characteristics of young adolescents' emotion regulation abilities as well as their perceived supportive and unsupportive responses from the three socializers (father, mother, and best friend). The main results showed: (a) emotion regulation abilities of young adolescents were increased one year later, $F\,(1, 414) = 6.727$, $p = 0.010$, $\eta_p^2 = 0.016$; (b) girls scored higher on emotion regulation abilities than boys, $F\,(1, 414) = 8.989$, $p = 0.003$, $\eta_p^2 = 0.021$; (c) both boys and girls perceived more

Table 1 Mean and standard deviation of the study variables

	Boys		Girls		Total	
	M	*SD*	*M*	*SD*	*M*	*SD*
ERA T2	1.61	0.29	1.66	0.26	1.64	0.28
ERA T1	1.55	0.27	1.64	0.23	1.60	0.25
Father support	2.93	1.05	2.7	0.99	2.80	1.02
Mother support	3.23	1.00	3.08	0.96	3.15	0.98
Friend support	3.31	1.11	3.48	0.94	3.41	1.02
Father nonsupport	1.70	0.70	1.52	0.63	1.60	0.67
Mother nonsupport	1.68	0.68	1.57	0.66	1.62	0.67
Friend nonsupport	1.69	0.65	1.53	0.55	1.60	0.60

ERA emotion regulation ability

Table 2 Results of bivariate and partial correlation analyses

	1	2	3	4	5	6	7	8	9	10
1 ERA T2	1			0.001	0.184^{***}	0.164^{***}	0.177^{***}	-0.110^{*}	-0.116^{*}	-0.208^{***}
2 ERA T1	0.495^{***}	1								
3 Age	−0.040	0.212^{***}	1							
4 Gender	0.088^{+}	0.189^{**}	0.181^{***}	1	-0.154^{**}	-0.113^{*}	0.040	−0.083	−0.036	−0.066
5 Father support	0.234^{***}	0.189^{***}	0.011	-0.112^{*}	1	0.665^{***}	0.416^{***}	-0.268^{***}	-0.140^{**}	−0.019
6 Mother support	0.256^{***}	0.241^{***}	0.031	−0.075	0.684^{***}	1	0.413^{***}	−0.071	-0.198^{***}	−0.016
7 Friend support	0.248^{***}	0.228^{***}	0.176^{***}	0.084	0.416^{***}	0.423^{***}	1	0.018	0.011	−0.089
8 Father nonsupport	-0.220^{***}	-0.263^{***}	−0.039	-0.133^{**}	-0.309^{***}	-0.129^{**}	−0.040	1	0.693^{***}	0.333^{**}
9 Mother nonsupport	-0.269^{***}	-0.304^{***}	−0.062	−0.077	-0.203^{***}	-0.268^{***}	−0.056	0.721^{***}	1	0.335^{***}
10 Friend nonsupport	-0.275^{***}	-0.257^{***}	-0.148^{**}	-0.130^{**}	−0.072	−0.070	-0.157^{***}	0.364^{***}	0.377^{***}	1

The values in the lower triangle are coefficients of bivariate correlation analysis, and those in the upper triangle are coefficients of partial correlation analysis after controlling for emotion regulation ability at T1 and young adolescents' age

ERA Emotion regulation ability

Gender is coded as 0 = boys, 1 = girls

$^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

supportive responses from friends compared to that from fathers and mothers; (d) boys generally perceived more unsupportive responses than girls, F (1, 431) = 8.724, $p = 0.003$, $\eta_p^2 = 0.020$. See the Supplemental Materials for further details.

Bivariate and partial correlation analyses were performed as shown in Table 2. The results of the partial analysis showed that the three socializers' supportive responses were all positive ($r = 0.161$–0.184) and unsupportive responses were all negatively ($r = -0.105$ to -0.198) correlated with emotion regulation abilities at T2, after controlling for emotion regulation abilities and age at T1. These results supported Hypothesis 1.

The Unique Effects of Fathers'/Mothers' and Friend's Responses

As shown in Table 3, Model 1 included emotion regulation abilities at T1, young adolescents' age and gender, explained 28.6% of the variance in emotion regulation abilities at T2. The results from Models 2 and 3 showed that maternal supportive ($\beta = 0.127$, $t = 2.889$, $p = 0.004$) and unsupportive ($\beta = -0.096$, $t = -2.100$, $p = 0.036$) responses predicted emotion regulation abilities one year later. After incorporating paternal responses, only paternal supportive responses predicted emotion regulation abilities one year later ($\beta = 0.124$, $t = 2.066$, $p = 0.036$). Model 4 considered the main effects of all three socialization agents and explained an additional 4.7% of the variance in emotion regulation abilities at T2 compared to Model 1. In this model, only friends' supportive responses positively ($\beta = 0.099$, $t = 2.133$, $p = 0.033$) and unsupportive responses negatively ($\beta = -0.126$, $t = -2.407$, $p = 0.016$) predicted an increase in emotion regulation abilities one year later. No main effects of the parental variables were found in Model 4. These results partially supported Hypothesis 2, which stated that friends' responses had a unique effect on changes in young adolescents' emotion regulation abilities, while parents' responses did not have an effect after controlling for gender. These results suggested that friend-versus-parent emotion socialization contributed more to emotion regulation abilities during early adolescence.

Gender Differences in the Interactive Effects of Fathers'/Mothers' and Friend's Responses

As shown in Table 4, the final model (Model 9) presents the significant interaction terms included in Models 5–8. Results showed that maternal supportive responses exhibited a significant interaction with gender ($\beta = 0.112$, $t = 1.962$, $p = 0.050$). Moreover, a significant tripe interaction was observed, where the interaction effect between fathers' and friends' unsupportive responses varied by gender ($\beta = 0.169$, $t = 2.493$, $p = 0.013$).

Furthermore, boys and girls were analyzed separately. For girls, maternal supportive responses predicted emotion regulation abilities one year later at a marginal significance level ($\beta = 0.152$, $t = 1.930$, $p = 0.054$). Friends' unsupportive responses ($\beta = -0.145$, $t = -2.092$, $p = 0.036$) and their interaction with paternal unsupportive responses ($\beta = 0.134$, $t = 2.317$, $p = 0.021$) significantly predicted emotion regulation abilities in girls at T2. The interaction pattern is shown in Fig. 1: friends' unsupportive responses negatively predicted girls' emotion regulation abilities at T2 when their fathers had low unsupportive responses ($\beta = -0.252$, $t = -2.567$, $p = 0.010$), but not when their fathers had high unsupportive responses ($\beta = -0.054$,

Table 3 Parents' and friends' responses as predictors of emotion regulation ability at Time 2

		Model 1		Model 2		Model 3		Model 4	
		β	*t*	β	*t*	β	*t*	β	*t*
Control variables	Emotion regulation ability at T1	0.539	10.436***	0.476	11.373***	0.474	11.292***	0.444	7.498***
	Age	−0.158	−3.515**	−0.158	−3.733***	−0.158	−3.755***	−0.183	−4.117***
Study variables	Gender	0.026	0.603	0.037	0.879	0.046	1.077	0.028	0.637
	Father support					0.124	2.066*	0.083	1.313
	Mother support			0.127	2.889**	0.050	0.800	0.032	0.469
	Friend support							0.099	2.133*
	Father nonsupport					−0.005	−0.076	0.003	0.043
	Mother nonsupport			−0.096	−2.100*	−0.081	−1.202	−0.049	−0.653
	Friend nonsupport							−0.126	−2.407*
R^2		0.286		0.314		0.318		0.333	

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

$t = -0.736$, $p = 0.462$). In boys, only friends' supportive responses positively predicted emotion regulation abilities at T2 ($\beta = 0.175$, $t = 2.636$, $p = 0.008$). The interaction effect between fathers' and friends' unsupportive responses on boys' emotion regulation abilities at T2 was not significant ($\beta = -0.088$, $t = -1.453$, $p = 0.146$). Overall, as expected in Hypotheses 3 and 4, an interaction effect between unsupportive responses from fathers and friends was found, which varied by young adolescent gender.

Supplementary Analysis

Regression models (Models S1 to S5) concerning the interactions between different response dimensions (e.g., paternal non-support × friend support) were conducted and are presented in Supplemental Table S1. As shown in Model S5, a marginally significant triple interaction was detected ($\beta = -0.113$, $t = -1.864$, $p = 0.062$). The interaction between fathers' unsupportive responses and friends' supportive responses was marginally significant among girls ($\beta = -0.110$, $t = -1.818$, $p = 0.069$) but not among boys ($\beta = 0.054$, $t = 0.803$, $p = 0.442$). This interaction effect also supported a synergistic pattern (see Fig. S1), where friends' supportive responses positively predicted girls' emotion regulation abilities one year later only when their fathers had low unsupportive responses ($\beta = 0.167$, $t = 2.092$, $p = 0.036$). These results were similar to the interaction results between the fathers' unsupportive responses and friends' supportive responses, which together support the robustness of the regression results.

Discussion

Early adolescence is a crucial period in which agents of emotion socialization extend from parents to friends. A thorough understanding how family and peer contexts collectively shape individual emotion regulation abilities is necessary. However, previous research has primarily examined the effects of parents and friends separately. How parents and friends jointly affect emotion regulation abilities development and whether their joint effects vary by young adolescent gender is unclear. To address these gaps, this study used a one-year follow-up design to examine how emotional responses from parents and friends uniquely and interactively affect young adolescent emotion regulation abilities and potential gender differences on their effects. Results in this study contribute to the age-specific emotion socialization process by demonstrating that although both parents and friends are influential as emotion socializers, friends are more influential than parents in early adolescence for emotion regulation development. This study further contributes to the process of gender-differentiated emotion socialization by revealing gender differences in the effects of parents' responses and their interactions with friends' responses on emotion regulation abilities. In summary, focusing on early adolescence, the present study highlighted the increasing power of friends in emotion regulation abilities and revealed the gender-differentiated emotion socialization process in this period. The results provide targeted recommendations for interventions that promote positive developmental outcomes among adolescents.

As hypothesized, this study showed that both parents and friends acted as emotional socializers during early adolescence. The supportive/unsupportive responses of parents and friends were both positively/negatively related to the increase in emotion regulation abilities one year later. These results were consistent with Hypothesis 1 and emotion-related socialization theories, which describe the facilitating role of supportive responses and the impeding role of unsupportive responses to negative emotions in the development of emotion regulation abilities (Miller-Slough &

Table 4 Parents' and friends' responses and their interaction terms created by corresponding dimensions as predictors of emotion regulation ability at T2

		Model 5		Model 6		Model 7		Model 8		Model 9	
		β	*t*	β	*t*	β	*t*	β	*t*	β	*t*
Control variables	Emotion regulation ability at T1	0.440	7.282***	0.428	7.122***	0.465	7.689***	0.456	7.520***	0.459	7.367***
	Age	−0.178	−3.952***	−0.178	−4.032***	−0.190	−4.257***	−0.186	−3.929***	−0.192	−4.067***
Study variables	Gender	0.040	0.893	0.032	0.674	−0.004	−0.093	0.004	0.106	−0.009	0.298
	Father support	0.057	0.633	0.093	1.478	0.082	1.306	0.077	1.257	0.087	1.225
	Mother support	0.024	0.342	−0.094	−1.154	0.034	0.508	0.031	0.359	−0.062	−1.384
	Friend support	0.140	2.313*	0.184	2.797**	0.104	2.251*	0.110	2.416*	0.119	2.818**
	Father nonsupport	0.003	0.044	0.022	0.337	0.038	0.437	−0.014	−0.258	0.035	0.388
	Mother nonsupport	−0.047	−0.618	−0.065	−0.852	−0.062	−0.807	−0.003	−0.036	−0.066	−0.508
	Friend nonsupport	−0.134	−2.517*	−0.142	−2.643**	−0.111	−1.506	−0.140	−1.876+	−0.120	−1.733
Interactions	Father × Friend support	0.002	0.034								
	Father support × Gender	0.059	0.825								
	Friend support × Gender	−0.070	−1.145	−0.104	−1.587						
	Father × Friend support × Gender	−0.062	−1.023								
	Mother × Friend support			−0.023	−0.421						
	Mother support × Gender			0.154	2.289**					0.112	1.962*
	Mother × Friend support × Gender			−0.054	−0.928						
	Father × Friend nonsupport					−0.072	−1.114			−0.075	−1.208
	Father nonsupport × Gender					−0.033	−0.465			−0.025	−0.361
	Friend nonsupport × Gender					−0.027	−0.394	0.004	0.050	−0.022	−0.321
	Father × Friend nonsupport × Gender					0.160	2.384*			0.169	2.493*
	Mother × Friend nonsupport							−0.009	−0.119		
	Mother nonsupport × Gender							−0.065	−0.79		
	Mother × Friend nonsupport × Gender							0.086	1.164		
R^2		0.335		0.340		0.344		0.338		0.348	

$^{+}p < 0.07$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

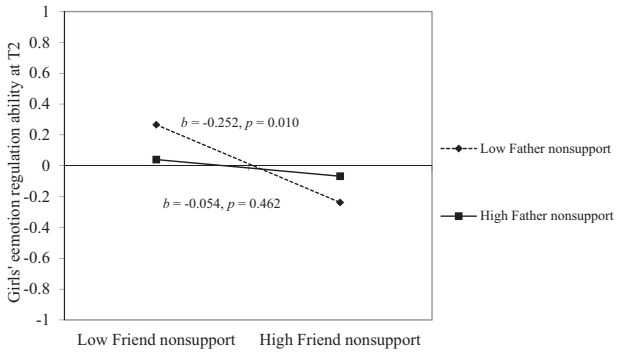

Fig. 1 Best friend's unsupportive responses predicting emotion regulation ability at T2 by father's unsupportive responses among girls. High and low values were mean ± 1 *SD*, respectively

Dunsmore, 2016). Moreover, parents and friends both displayed unique influences on emotion regulation abilities during early adolescence. Friends' responses predicted emotion regulation abilities one year later when parents' responses were controlled for, while parents' responses predicted emotion regulation abilities one year later among girls when friends' responses were taken into account. These findings suggested that improving emotion socialization practices among both parents and friends is crucial, especially during this critical period of early adolescence when emotion regulation abilities are still under development (Wang et al., 2021).

More importantly, this study stresses that in early adolescence, friends tend to play a more important role than parents in the domain of emotion regulation development. Specifically, friends' responses made unique contributions to both girls' and boys' emotion regulation abilities surpassing parents' responses. Parents' responses only contributed to girls' emotion regulation abilities after including friends' responses. These results were consistent with a meta-analysis on empathy, which found that empathy was more related to peer relationships than to parent-child relationships (Boele et al., 2019). A recent study also found that friends' responses (reported by young adolescents) were more saliently related to anger regulation than parents' responses (reported by parents) (Hale et al., 2023). However, compared to the study by Hale et al. (2023), the current study improved comparability between parents and friends by measuring parents' and friends' responses from the same informant (both reported by young adolescents). Moreover, evidence in prior research is based on intercept findings that reflect cross-sectional data (Hale et al., 2023). The present study supported the relative importance of friends over parents after controlling for the initial emotion regulation abilities at T1, thus enhancing the credibility of the evidence.

From the perspective of gender-differentiated emotion socialization, this study found that girls' emotion regulation abilities may rely more on parents' responses than boys'. Controlling for the effects of friends' responses, boys' emotion regulation abilities were not predicted by their parents' responses; In contrast, girl's emotion regulation abilities were still predicted by mothers' supportive responses and by the interaction term between fathers' and friends' unsupportive responses. Although prior research also showed that girls are more sensitive than boys to parents' reactions (Perry et al., 2017; Yap et al., 2008), they did not control the effects of friends' responses. As friends' responses are another important source of emotion socialization in early adolescence, the present study added new and more solid evidence to these gender differences in the relative importance of parental and peer responses. Future studies should explore the factors that contribute to these gender differences. For example, differences in young adolescents' preferences for seeking support from parents or friends may help explain these differences (Wright et al., 2023).

The differential influences of fathers and mothers on girls' emotion regulation abilities provide new evidence for parental gender-differentiated socialization of emotions (Eisenberg, 2020; Endendijk et al., 2017). Consistent with a previous study (Hurrell et al., 2015), mothers' supportive (rather than unsupportive) responses and fathers' unsupportive (rather than supportive) responses showed relative importance in this study. In predicting girls' emotion regulation abilities, mothers' supportive responses explained the additional variance beyond friends' responses, whereas mothers' unsupportive responses did not. Mothers usually provide more supportive responses than fathers to daughters. Thus, daughters' emotion regulation abilities may benefit more from their mother's supportive responses (Klimes-Dougan et al., 2007). By contrast, fathers' supportive responses did not provide additional predictive power, but their unsupportive responses moderated the predictive power of friends' responses, partially supporting Hypothesis 3.

Based on previous empirical findings, no evidence has been presented regarding the specific patterns (e.g., buffer or synergistic) in which parents and friends jointly influence young adolescents' emotion regulation abilities. For the first time, the present study revealed that fathers' and friends' unsupportive responses seem to work together in a synergistically interactive pattern. Due to girls' sensitivity to unsupportive responses, unsupportive responses from fathers might potentially hinder girls' emotion regulation abilities, thereby limiting the impact of unsupportive responses from friends. Only when fathers' unsupportive responses were low, friends' unsupportive responses significantly predicted girls' emotion regulation abilities. In other words, unsupportive responses from fathers and friends exhibit a synergistic pattern of interaction (Sentse & Laird, 2010; Wang et al., 2019). In contrast, mothers' supportive response is more influential for girls. As

mothers' and friends' support appear to function as relatively independent systems during early adolescence (Helsen et al., 2000), they showed no interactive effect on girls' emotion regulation abilities. Future studies could make more effort to investigate why fathers' and mothers' responses might be combined with friends' responses in distinct patterns among young adolescent girls.

This study focused on young adolescents to examine the combined effects of parental and friend emotion socialization on emotion regulation abilities, thus providing insights into age-specific emotion socialization processes (Eisenberg, 2020). Early adolescence is a key period for emotion regulation development (Wang et al., 2021), and the transition in which communication and trust with parents decreases while communication and trust with friends increase (Keijsers & Poulin, 2013; Park et al., 2023). In other words, early adolescence is a period of significant change in both internal development and external social environment. Focusing on the joint effects of parents' and friends' responses to emotion regulation abilities, this study showed the importance of understanding the dynamic processes of emotion socialization in this population. Compared with studies that emphasize the importance of parents in childhood (Morris et al., 2007; Johnson et al., 2017) and friends in adolescence (Miller-Slough & Dunsmore, 2016), this study suggests that early adolescence is a turning point when friends' responses matter more than parents' responses. Further research is required to delve into the joint effects of multiple socializers during this period. For example, parents' and friends' relative and multiplicative roles in socializing internalizing emotions (e.g., sadness) and externalizing emotions (e.g., anger) may be different (Hale et al., 2023).

Using a situational judgment test to assess emotion regulation abilities, this study verified the effect of emotion socialization on emotion regulation from a more objective perspective. Prior research adopted subjective report rating scales to assess the use of typical emotional strategy (e.g., Borowski et al., 2018) and regulation outcomes (e.g., Miller-Slough & Dunsmore, 2019). The results of the present and previous studies supported each other, pointing out the importance of emotion socialization in affecting young adolescents' emotion regulation abilities. To further examine how parents and friends jointly affect the flexibility of strategy use, habitual strategies, and regulation outcomes of young adolescents' emotion regulation, future research should use both situational tests and subjective rating scales. This may strengthen the evidence of the effects of emotion socialization on emotion development in early adolescence.

Practically, the findings highlight that more attention should be paid to emotion socialization during early adolescence, especially emotion socialization among friends. Prevention programs based on emotion socialization, such as Tuning in to Kids (TIK, Bjørk et al., 2022), mainly focus on parents' role. However, this study found that friends' responses contributed more to increased emotion regulation abilities in young adolescents. This finding suggested that friends' emotion socialization should be included as an important prevention pathway, at least in early adolescence. Of note, this study highlights the importance of friend emotion socialization but does not negate the importance of parental emotion socialization. The results of the interaction analysis showed that girls had relatively higher levels of emotion regulation abilities when mothers had more supportive responses, and when both fathers and friends had less unsupportive responses. These results underline that, for young adolescent girls, a better way to promote their emotional abilities might be to carry out emotional learning programs in both family and school contexts. In the family context, girls' mothers could focus more on increasing supportive responses, whereas fathers could focus more on reducing unsupportive responses. In the school context, using supportive responses and avoiding unsupportive responses should be taught to young adolescents.

Some limitations should be listed and addressed in future research. First, the study used only a sample in early adolescence, and it remains unclear how parents' and friends' emotion socialization jointly influence emotion regulation abilities in mid and late adolescence. According to attachment literature, parent-child relationships worsen from early to middle adolescence but then improve in late adolescence, while attachment to peers continues to increase throughout the entire adolescent period (Allen, 2008). These changes in relationship quality may alter emotional interactions, and thus produce different patterns of joint effects on late adolescents' emotional abilities. Future research can answer this question by examining the longitudinal patterns of emotional responses from both parents and friends and comparing the joint contributions of these responses to emotional abilities between early, middle, and late adolescent samples.

Second, this study did not distinguish between best friends. The participants were asked to report their perceived responses from only one best friend. According to the literature, adolescents usually nominate several best friends (You et al., 2013), and different best friends may not respond equally to individual emotions. To obtain a more complete understanding of friend emotion socialization, future research should examine the responses of different best friends.

Finally, this study used a single reporter and method to assess the study indices, which may limit the understanding of the role of emotion socialization in young adolescents' emotional development from multiple perspectives. Although this approach improved the comparability between parents and friends, it would be interesting to compare results based on multiple informants. It is also important to explore the role of

parent-adolescent and friend-adolescent perception discrepancies. Additionally, both emotion socialization and emotion regulation involve conscious and nonconscious processes, and the unconscious components are difficult to measure using scales and tests (Yuan et al., 2015). The use of observation methods, qualitative interviews, and records of physiological data such as heart rate reactivity can provide more comprehensive information.

Conclusion

During early adolescence, the development of emotion regulation ability is crucial and the sources of emotion socialization expand from parents to friends. However, scarce research has examined the unique and interactive effects of parental and friends' emotion socialization on young adolescents' emotion regulation abilities. This study addresses this gap by investigating fathers, mothers, and friends as agents of emotion socialization, while considering young adolescent gender. To conduct the analysis, data was collected from a longitudinal survey with a one-year interval, encompassing young adolescents aged from 10 to 14 years. The findings revealed noteworthy insights. To begin with, friends' responses uniquely contributed to the development of emotion regulation abilities across genders, while parents' responses only impact girls' emotion regulation abilities. Additionally, the study uncovered distinct patterns in the influences of mothers and fathers on girls. In girls, mothers' supportive responses significantly predicted better emotion regulation abilities, while fathers' unsupportive responses did not directly predict but moderated the effect of friends' responses. These findings extend existing theories on emotion-related socialization by revealing age-specific and gender-specific processes in multiple-emotion socialization contexts. This extension underscores the vital significance of considering multiple socialization agents, encompassing both the family and peer contexts, while also addressing gender differences. Such considerations are crucial for effectively promoting healthy emotional development during early adolescence.

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Authors' Contributions J.W. conceived of the study, leaded the design, investigation, analysis, and writing of original draft; M.Z.W. participated in the analysis and design, and helped to edit and revise the draft; X.P.D. participated in interpretation of the data, contributed to editing and revising the draft; K.M.P.V. supported the writing of review and editing; K.H. supported the statistical analysis and interpretation; H.Z. supervised the conceive, design, measurement, and analysis. All authors read and approved the final manuscript.

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Data Sharing and Declaration The dataset analyzed during the current study is not publicly available but is available from the corresponding author on reasonable request.

Compliance with Ethical Standards

Conflict of Interest The authors declare no competing interests.

Ethical Approval All procedures performed in this study involving human participants were in accordance with the ethical standards of Beijing Normal University and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent All participants and their parents in this study provided informed consent.

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