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Longitudinal Links between Maternal and Peer Emotion Socialization and Adolescent Girls' Socio-emotional Adjustment

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Abstract

Although research has demonstrated that both parents and peers influence adolescent development, it is not clear whether these relationships also serve as contexts for emotion socialization. In the current longitudinal study, we investigated whether maternal and peer emotion socialization were related to adolescent girls' daily emotions, emotion regulation, and social and emotional adjustment. The sample included 160 adolescent girls from low-income families followed across two years. At T1, girls reported on maternal and peer emotion socialization practices during laboratory visits. At T2, girls reported on daily negative and positive affect using ecological momentary assessment across two weeks. Emotion regulation, internalizing problems, and prosocial behavior were assessed during laboratory visits at both T1 and two years later (T3). Results demonstrated that higher levels of maternal and peer emotionally supportive socialization practices were associated with lower levels of girls' daily negative affect. Mothers' supportive practices also predicted increases in girls' emotion regulation over time. Both maternal and peer unsupportive practices predicted more internalizing problems, and peer unsupportive practices predicted less prosocial behavior over time. This study supports and expands Eisenberg's heuristic model (1998a) by demonstrating that both maternal and peer emotion socialization are associated

with adolescent girls' emotional and behavioral outcomes, and maternal and peer emotion socialization have differential effects.

Keywords

emotion socialization; supportive and unsupportive relationships; internalizing problems; prosocial behavior; adolescence

Adolescence is a critical developmental period marked by biological, cognitive, social, and emotional changes which may place adolescents at risk for psychological and behavioral problems (Steinberg et al., 2006; Steinberg & Morris, 2001). Adolescents often experience novel and intense emotions (Guyer, Silk, & Nelson, 2016), and this is particularly true for girls (Rose, 2002). Emotional reactivity and emotion regulation difficulties have been identified as core mechanisms underlying adolescents' adjustment problems (Dahl, 2004). Moreover, adolescents are nested in multiple relationships, and parent-youth and peer relationships are both significant as they are critical to social and emotional development (Furman & Rose, 2015). Parent-youth interactions, specifically parental emotion socialization (ES) practices, have been linked to adolescent social competence and psychological wellbeing through the expression and regulation of emotions (Eisenberg, Cumberland, & Spinrad, 1998a; Morris et al., 2007). As children reach adolescence, they start to spend more time interacting with people outside of the family, such as friends and classmates (Steinberg, 2011). Therefore, peers likely play an important role in emotion socialization (ES) during adolescence (Criss, Houlberg, et al., 2016).

To date, there is more research on how peer relationships shape adolescents' social and behavioral adjustment compared to emotional adjustment (for exceptions see Borowski, Zeman, & Braunstein, 2018; Criss, Houlberg, et al., 2016; Klimes-Dougan et al., 2014). Investigating the roles that parents and peers play in ES may be especially salient among adolescent girls from disadvantaged backgrounds because girls from low-income families are at increased risk for emotion-related difficulties (e.g., internalizing symptoms; Breslau et al., 2017; Steinberg et al., 2006). In the current study, we focused on adolescent girls, particularly those from low-income, ethnically diverse families. The overall purpose of the current longitudinal study was to investigate how maternal and peer ES were linked to adolescent girls' positive and negative emotions (i.e., daily reports of affect intensity in real-time), emotion regulation, and girls' social and emotional adjustment (i.e., internalizing problems and prosocial behavior) over time.

Socialization of Emotion

In the last decade of the 20th century, there was a burgeoning amount of research on parental socialization of emotion including Nancy Eisenberg and colleagues' (1998a, 1998b) heuristic model of ES. Eisenberg's model influenced numerous researchers who found associations between parents' emotion-related practices and children and adolescents' emotional reactivity and regulation and thus social and emotional competence, particularly among toddlers and young children (e.g., Brophy-Herb et al., 2011; Cassano & Zeman, 2010; Cole, LeDonne, & Tan, 2013). Researchers also have found the effects of ES on

developmental outcomes were often mediated or moderated by youth's arousal or emotional competence (e.g., Eisenberg et al., 1998a, 1998b; Morris et al., 2007). In the current study, we examined parents' supportive and unsupportive ES and extend Eisenberg et al.'s (1998a) model by also examining peer ES. Guided by Eisenberg and colleagues' (1998a, 1998b) heuristic model and later empirical studies, we examined whether both maternal and peer socialization predicted adolescents' daily emotions and regulation and their socio-emotional adjustment.

Parent Emotion Socialization

During childhood and adolescence, parents are often very influential in emotional and social development, in part due to emotion-related parenting practices (Morris, Cui, Criss, & Simmons, 2018; Morris, Cui, & Steinberg, 2013). Such practices include parents' reactions to their children's emotions, parents' discussion of emotions, and parents' own expression of emotion. Unsupportive ES, such as punitive and minimizing reactions to emotions and parents feeling distressed themselves, have been linked to negative emotionality as well as social and emotional problems in children (Eisenberg et al., 1998a, 1999; Fabes, Leonard, Kupanoff, & Martin, 2001). Supportive ES behaviors include rewarding/coaching, encouraging negative emotional expression, and problem-focused reactions, which reflect the degree to which parents provide comfort, empathize, and problem solve with children regarding their emotions in a responsive and warm manner (Magai et al., 2004; O'Neal & Magai, 2005). Based on Tomkins' (1963) theory, Magai and colleagues (1997) developed a parent ES measure (Emotions as a Child Scale; EAC) and argued that supportive responses in particular promote secure attachment and healthy emotional development, whereas unsupportive responses may lead to negative outcomes and insecure attachment (Magai, Consedine, Gillespie, O'Neal, & Vilker, 2004).

Empirical evidence has consistently demonstrated the links between parent supportive ES and adolescent emotional and behavioral competence, and between unsupportive ES and the development of psychopathology (Eisenberg et al., 1998a; O'Neal & Magai, 2005). For example, some researchers have found that parents' unsupportive ES (e.g., neglect and punishment of sadness and anger, magnification of anger) is linked to both internalizing and externalizing problems, while supportive ES (e.g., rewarding or coaching of sadness and anger, overriding or distraction of sadness) is linked to adolescent emotion regulation, low negative affect and low internalizing problems (e.g., Brand & Klimes-Dougan, 2010; Katz & Hunter, 2007; O'Neal & Magai, 2005; Shortt, Stoolmiller, Smith-Shine, Eddy, & Sheeber, 2010). Intervention studies also have suggested that parents' improvement in ES is linked to reductions in somatic complaints and internalizing problems among youth (e.g., Kehoe, Havighurst, & Harley, 2014). Thus, there is ample evidence that parent ES contributes to social and emotional outcomes during adolescence.

Nevertheless, parents may socialize girls and boys differently (e.g., Cassano & Zeman, 2010; Chaplin, Cole, & Zahn-Waxler, 2005; Klimes-Dougan et al., 2007; Loughheed et al., 2016), and the effects of parent ES may differ among girls and boys (e.g., Shortt et al., 2016). For example, adolescents typically report closer relationships with their mothers and report being more likely to discuss emotional problems with mothers who tend to be more

involved in their children's lives compared to fathers (Updegraff, McHale, Crouter, & Kupanoff, 2001). Girls' relationships with parents (especially mothers) tend to be focused more often on emotions, and girls display higher levels of open communication and mutual emotional support compared to boys (Bardack & Obradovi, 2017; Criss, Houlberg, et al., 2016; Larson & Richards, 1994). Moreover, emotional support may be particularly important in protecting girls against mood and anxiety problems (Aupperle et al., 2016). Further, there is evidence suggesting that parents from ethnic minority and/or low-income families are more likely to use intrusive (punitive and controlling) parenting styles which create a negative family emotional climate dampening the development of emotion regulation among adolescents (e.g., Consedine, Magai, Horton, & Brown, 2012; Cui, Morris, Criss, Houlberg, & Silk, 2014; O'Neal & Magai, 2005). Adolescent girls living in high-crime and poor neighborhoods are particularly at risk for developing internalizing problems (Kliewer et al., 2004). Thus, it is critical to investigate parent ES in such families. In the current study, we also focused on mothers instead of fathers because of the high percentage of single mothers in our sample.

Peer Emotion Socialization

Due to increases in peer affiliation, friends serve a variety of functions during adolescence, such as companionship, intimacy, and social and emotional support (Rubin, Bukowski, & Bowker, 2015). Compared to peer relationships among boys, girls' friendships tend to be characterized by higher levels of self-disclosure, open communication, affection, and emotional support (Belle, 1989; Miller-Slough & Dunsmore, 2016; Rose, 2002). Peers may focus on positive emotions instead of negative emotions during social interactions (Lougheed et al., 2016). More importantly, peer relationships are critical contexts for socialization for a variety of emotional and behavioral outcomes (e.g., Rose, 2002; see Hartup, 1996 and Rubin et al., 2015 for reviews). Researchers have found that friendship quality or peer support is positively related to the use of effective emotion regulation strategies and negatively linked to ineffective strategies for both girls and boys, and girls are also more likely to endorse emotionally engaged strategies (e.g., Glick & Rose, 2011; Legerski, Biggs, Greenhoot, & Sampilo, 2015).

There is a growing body of literature focusing on peer ES and its implications (see Miller-Slough & Dunsmore, 2016 for a review). Studies particularly using Magai and colleagues' EAC measure also are increasing, and these studies have employed various research designs. Researchers using cross-sectional designs have found that friends' supportive ES behaviors (i.e., reward/coach and override) in response to their negative emotions have been associated with better emotion coping and less dysregulation, whereas friends' unsupportive ES (e.g., magnify, neglect, or punish) were positively related to internalizing and externalizing problems, particularly among adolescent girls (e.g., Borowski et al., 2018; Klimes-Dougan et al., 2014; Parr, Zeman, Braunstein, & Price, 2016). However, the use of supportive ES such as rewarding/coaching reactions are often not significantly related to developmental outcomes, and most of these studies are among European American youth from middle- and higher-income families (see Miller-Slough & Dunsmore, 2016 for a review). Moreover, Miller-Slough and Dunsmore's (2018) longitudinal study found that friends' unsupportive ES (i.e., punishment of negative emotions) predicted decreases in emotion regulation among

adolescent girls. Given the importance of friendship and psychological intimacy among adolescent peers (Rose, 2002; Rubin et al., 2015), it is informative to further investigate whether peer supportive and unsupportive ES are linked to social and emotional outcomes during adolescence, particularly among adolescent girls from disadvantaged backgrounds (e.g., Criss, Morris, Ponce-Garcia, Cui, & Silk, 2016).

Indirect Effects via Emotion Expression and Regulation

The effects of ES on developmental outcomes have been posited to be mediated by youth's arousal/expressed emotion or emotion regulation, and this has been found in a number of studies (e.g., Eisenberg et al., 1998a; Morris et al., 2007). Expressed affect has typically been assessed in laboratory settings (e.g., Cui, Morris, Harrist, Larzelere, & Criss, 2015) or by self-reports across a short period of time such as daily affect (e.g., ecological momentary assessment, EMA; Silk, Steinberg, & Morris, 2003). Daily affect intensity likely reflects emotion regulation abilities because emotional experiences require the use of regulation strategies (Guyer et al., 2016; Paus, 2009). EMA is an extremely valuable approach for examining daily emotions and regulation and is considered an ecologically valid measure. Affect intensity in daily life has been widely studied, and negative affect intensity has been linked to both internalizing and externalizing problems (e.g., Eisenberg et al., 2001; Silk et al., 2003, 2011).

Empirical research has demonstrated indirect links (via expression/regulation or emotional competence) between parenting and peer relationships and adjustment (e.g., Criss, Houltberg, et al., 2016; Cui et al., 2014; Cunningham, Kliewer, & Garner, 2009). Studies focusing on specific parent or peer ES practices showed evidence of indirect effects of ES on depressive symptoms via maladaptive emotion regulation among children and early adolescents (e.g., Tillery, Cohen, Parra, Kitzmann, & Howard Sharp, 2015; Yap, Allen, & Ladouceur, 2008; Yap, Schwartz, Byrne, Simmons, & Allen, 2010). However, very few longitudinal studies have been conducted to examine such mediational effects on adjustment outcomes, particularly changes in behavior over time, and the developmental influences of ES on outcomes. Moreover, studies focusing on positive affect and positive developmental outcomes such as prosocial behavior are scarce. Researchers have typically examined empathy or sympathy as a mediator between parent ES and prosocial behavior in such studies, particularly among young children (e.g., Eisenberg, Fabes, & Murphy, 1996; Padilla-Walker, 2014; Taylor, Eisenberg, Spinrad, Eggum, & Sulik, 2013). In the current study, in addition to examining internalizing problems and negative affect, we examined adolescent girls' positive affect, prosocial behavior, and emotion regulation to assess a broader array of factors related to parent and peer ES.

The Current Study

The goal of the current study was to examine how maternal ES was linked to adolescent girls' emotional functioning and thus their socio-emotional adjustment as predicted by Eisenberg and colleagues' (1998a, 1998b) model and to expand the model by investigating whether peer ES would have similar effects. Specifically, we tested 1) whether T1 maternal supportive and unsupportive ES predicted adolescent girls' emotional functioning (i.e., T2

daily affect and T3 emotion regulation; ER) and T3 adjustment outcomes (i.e., internalizing problems, and prosocial behavior) controlling for T1 ER and outcomes; 2) whether T1 peer supportive and unsupportive ES predicted girls' emotional functioning and T3 adjustment controlling for T1 ER and outcomes; 3) whether girls' emotional functioning (i.e., T2 daily affect and T3 ER) mediated the associations between ES and outcomes. We hypothesized that both maternal and peer supportive ES would be positively related to adolescent girls' emotional functioning and adjustment outcomes. In contrast, maternal and peer unsupportive ES would be negatively linked to girls' emotional functioning and adjustment. We expected both daily affect and ER would mediate the links between maternal and peer ES and adjustment. We examined both positive and negative daily affect, because the regulation of positive emotions is important in adolescent psychopathology but is often ignored in empirical studies (e.g., Gilbert, 2012; Loughheed et al., 2016).

Method

Participants

Data were collected from 160 adolescent girls (M age = 13.94 years, SD = 1.23, Age Range = 12-17.92 years; the majority were 12-15 years-old, five were between 16 and 18 years; 45% African American, 25% European American, 3.1% Latino American, 15.6% Native American, 11.3% other ethnic groups) and their female primary caregivers (86.9% biological mothers, 3.8% adoptive mother, 3.1% stepmother, 3.8% grandmother, 1.3% aunt, 0.6% foster mother, 0.6% other, referred to as mothers) at T1 from predominantly low-income families ($Median$ annual income = \$24,000; 47.4% of families living below poverty line) with 41.2% of families headed by single parents. Data from 8 biological father-daughter and 3 stepfather-stepdaughter dyads were excluded from analyses. Two years later, 129 families (80.6% of original sample) with adolescent girls (M age = 15.61, SD = 1.26; Age range = 13-20; 42.1% African American, 27% European American, 3.2% Latino American, 15.1% Native American, 12.6% other ethnic groups) and their primary caregivers ($Median$ annual income = \$36,000, 37.6% single parent families) continued to participate in the study.

Procedure

Institutional Review Board (IRB) approval from Oklahoma State University (approved protocol number "HE1136", titled "Promoting mental health in adolescent girls") was obtained prior to recruitment and data collection at all time points. Participants were recruited from communities with high percentages of ethnic minority and low-income families through fliers distributed at local Boys and Girls Clubs and public facilities, such as the Young Men's Christian Association (YMCA). Snowball sampling was also used (had participants give study fliers to friends). At T1 (week 1), parents and adolescents participated in a 2½-hour university laboratory assessment consisting of questionnaires and observational discussion tasks. In the next two weeks after the T1 laboratory visit (T2, weeks 2-3), the girls participated in daily phone interviews using Ecological Momentary Assessment (EMA; Silk et al., 2003, 2011). Specifically, girls were randomly called twice on weekdays (after 4 PM) and four times on weekends (after 10 AM) for a possible total of 36 calls. If the girls did not answer the call, alternative phone numbers provided by the girls

were used. A total of 5,355 calls were completed for a successful response rate of 87%. During the phone interviews, adolescents were asked questions about what they were doing, where they were, whom they were hanging out with, and how they were feeling (their current emotional intensity). Approximately two years later (T3), the parent and adolescent returned to the university laboratory for a one-hour assessment during which both completed a series of questionnaires.

Measures

Emotion socialization (ES).—At T1, we used the Emotions as a Child measure (EAC; Magai & O’Neal, 1997) to assess the female primary caregivers’ ES (referred to as maternal ES). Both anger and sadness measures were used. Wording was adapted for reports on peer ES. Participants were asked to report on a female friend of a similar age; they reported knowing their friend for an average of 6.56 years ($SD = 4.56$). Adolescents rated the items using a 5-point Likert scale, 1 (*Not at all*), 3 (*Sometimes*), and 5 (*Very much*), e.g., “When you have been angry/sad, how often did your parent/friend help you deal with the problem? (reward)” “...tell you to change your attitude/to cheer up? (override)”, “...get angry with you/ tearful and cry? (magnify)”, “...not notice/not be around (neglect)”, “...say you should be ashamed/give you a disgusted look (punish)”. Sadness override, reward, punish, and anger reward, neglect, and magnify subscales were used as they showed adequate internal consistency (Cronbach’s α s were .78, .85, .74, .90, .62, and .73 for reports on mothers, and .65, .78, .65, .86, .65, and .63 for reports on peers; similar reliabilities were found in other ethnic diverse samples of adolescents, e.g., O’Neal & Magai, 2005). Sadness neglect and magnify, and anger override and punish subscales were discarded as they showed low internal consistency (below .40) in the current study.

Daily affect.—At T2, across two weeks adolescents reported on how they were feeling at the moment they were called for their telephone interview. Positive and negative emotions were chosen from the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). For example, they were asked “how would you rate how happy (good, satisfied) you are” on a 5-point Likert scale, 1 (*Very slightly or not at all*), 2 (*A little*), 3 (*Moderately*), 4 (*Quite a bit*), and 5 (*Extremely*). Eight emotions were reported on, including “happy (good, satisfied)”, “sad (blue, unhappy)”, “cheerful (full of good spirits)”, “nervous (worried, uneasy)”, “upset (disturbed or agitated, emotional or mental distress)”, “interested (really paying attention to something, being involved in what you were doing)”, “angry (feeling or showing anger)”, and “excited (waiting for something good)”. A composite score of *positive affect* intensity, and a composite score of *negative affect* intensity were created across the two weeks. Correlations between the four positive emotions (i.e., happy, cheerful, excited, interested) ranged from .63 to .86, and correlations between the four negative emotions (i.e., sad, nervous, upset, angry) ranged from .58 to .87.

Self-reported emotion regulation (ER).—At both T1 and T3, adolescents reported on their own anger and sadness regulation using the Children’s Emotion Management Scale: Sadness and Anger scales (CSMS, Zeman, Shipman, & Penza-Clyve, 2001; CAMS, Zeman et al., 2002). The sadness and anger coping subscales were used in this study as indicators of adolescent ER. The sadness subscale includes 5 items such as “When I am feeling sad, I

control my crying and carrying on” and “I stay calm and don’t let sad things get to me” (Cronbach’s α was .59 at T1 and .68 at T3). The anger subscale included 4 items such as, “When I am feeling mad, I control my temper” and “I can stop myself from losing my temper” (Cronbach’s α was .65 at T1 and .79 at T3). The scale ranges from 0 (*Not true*) to 2 (*Very true*). Previous studies have demonstrated adequate internal validity of the scales with a Cronbach’s α ranging from .62 to .77 (e.g., Sullivan, Helms, Kliewer, & Goodman, 2010; Zeman et al., 2001, 2002). This measure has also been validated in similar ethnically diverse low-income samples (e.g., Criss, Morris, et al., 2016; Cui et al., 2014). Sadness and anger coping subscale scores were averaged to create a composite score for adolescent ER ($r = .45$, $p < .001$ at T1; $r = .48$, $p < .001$ at T3).

Internalizing problems.—Adolescent internalizing problems were assessed as anxiety and depressive symptoms. At both T1 and T3, the Screen for Child Anxiety Related Disorders (SCARED; Birmaher et al., 1999) was used to assess adolescent anxiety symptoms, which included 41 items such as “I get stomachaches at school”, “When I get frightened, I feel like I am going crazy”, and “I worry about what is going to happen in the future.” Adolescents reported on their anxiety symptoms during the last three months on a 3-point scale, 0 (*Not true or hardly ever true*), 1 (*Somewhat true or sometimes true*), and 2 (*Very true or often true*). Cronbach’s α were .94 at T1 and .95 at T3, and items were averaged for a composite score.

At both T1 and T3, adolescents also reported on their own depressive symptoms during the last two weeks using the Child Mood & Feelings Questionnaire (MFQ-C; Angold & Costello, 1987) on a 3-point scale, 0 (*Not true*), 1 (*Sometimes*), and 2 (*True*). This measure includes 33 items such as “I felt miserable or unhappy”, “I was less hungry than usual”, and “I thought there was nothing for me in the future.” Cronbach’s α were .94 at T1 and .96 at T3 and items were averaged for a composite score. Anxiety and depressive symptom composite scores ($r = .62$, $p < .001$ at T1 and $r = .67$, $p < .001$ at T3) were further averaged to create composite internalizing problems variable.

Prosocial behavior.—At both T1 and T3, adolescents reported on their prosocial behavior during the past year using 5 items from the Strengths and Difficulties Questionnaire (SDQ, Goodman & Scott, 1999) based on a 3-point scale, 0 (*Not True*), 1 (*Sometimes*), and 2 (*True*). Sample items included “I try to be nice to other people”, “I care about their feelings”, and “I usually share with others.” Cronbach’s α were .84 at T1 and .81 at T3 (similar reliabilities were found in previous studies of similar populations, e.g., Cui, Morris, Harrist, Larzelere, Criss, et al., 2015b).

Results

Analytical Strategy

There were approximately 18% missing data due to participant dropout. Little’s MCAR test suggested that the data were missing completely at random, $\chi^2(97) = 96.14$, $p = .51$. Descriptive and correlational analyses were conducted in SPSS 25. For the purpose of data reduction, exploratory factor analyses with oblique rotation on EAC subscale scores were conducted to extract higher order factors. Results showed that sadness override and reward,

and anger reward loaded together as one factor, with factor loadings of .89, .92, .91 respectively for reports on mothers and .82, .91, .90 for reports on peers, and we labeled this factor as supportive ES. Sadness punish, anger neglect and magnify loaded together as a second factor, with factor loadings of .71, .72, .79 respectively and .63, .77, .81 for reports on peers, and we labeled this factor as unsupportive ES. The same structure held for reports on both mothers and peers ($r = -.23$ between maternal supportive and unsupportive factors and $r = -.04$ between peer factors). Such categorization also fit with previous studies using EAC (e.g., Magai et al., 2004; Miller-Slough & Dunsmore, 2018). Latent variables of supportive and unsupportive ES were created for further analyses.

To answer our research questions, we conducted a series of structural equation models (SEM) using *Mplus* 7.3 (Muthén & Muthén, 1998-2017) by testing mother and peer effects in separate models. We included maternal and peer supportive and unsupportive ES factors in the same measurement model and found that maternal and peer unsupportive ES were highly correlated, $r = .80$, $p < .001$, and the supportive ES latent factors were also highly correlated, $r = .49$, $p < .001$, likely because these variables were all reported by adolescents. Thus, maternal and peer ES latent factors were tested in separate structural models to avoid multicollinearity. After testing the measurement models for both maternal and peer ES, we tested longitudinal links using adolescent positive and negative affect as mediators and then tested the model using adolescent self-reported ER as a mediator in the structural models, while controlling for T1 variables and adolescent age (Figures 1-4). Given our moderate sample size, daily affect intensity and emotion regulation were tested in separate models to increase statistical power. Family annual income reported at T1 was included as a control variable but trimmed due to its nonsignificant association with outcome variables. We employed maximum likelihood (ML) for parameter estimation to account for missing data. Model fit indices were examined for adequate fit (CFI $> .05$, RMSEA $< .06$, SRMR $< .08$; Marsh, Hau, & Wen, 2004).

Descriptive Analyses

As shown in Table 1, T1 maternal and peer ES factors were generally related to positive and negative affect at T2 in the expected directions, were related to both T1 and T3 ER, and T1 prosocial behavior. T1 internalizing problems were positively related to T2 negative affect and negatively linked to T3 ER. T1 prosocial behavior was positively linked to T2 positive affect and T3 ER. T2 positive affect was positively related to T3 ER and prosocial behavior. T2 negative affect was positively associated with internalizing problems and negatively related to ER at T3. ER, internalizing problems, and prosocial behavior were moderately stable across time. Positive and negative affect were also positively correlated.

ANOVA analyses revealed significant ethnic differences on T1 and T3 prosocial behavior (comparing European, African, and Native Americans), $F(2, 131) = 4.72$, $p = .01$ and $F(2, 103) = 8.08$, $p = .001$, respectively. Post hoc tests suggested that African American girls reported lower levels of prosocial behavior compared to European American girls at T1 ($M_s = 1.36$ vs. 1.62) and compared to both European and Native American girls at T3 ($M_s = 1.46$ vs. 1.68 and 1.84). No other ethnic differences were found.

Effects of Maternal Emotion Socialization

The measurement model with maternal supportive and unsupportive latent factors fit the data well, $\chi^2(8) = 14.35, p = .07$; CFI = .98; RMSEA = .07; SRMR = .05. To test the effects of maternal ES on girls' emotional functioning and adjustment outcomes, we first examined daily positive and negative affect as mediators (Figure 1). Model modification indices suggested that we should specify the link between T1 internalizing problems and T2 negative affect. We made this change and the final model fit the data well, $\chi^2(49) = 59.51, p = .14$; CFI = .98; RMSEA = .04; SRMR = .05. The results showed that T1 maternal supportive ES was negatively related to girls' negative affect at T2. T1 maternal unsupportive ES predicted internalizing problems at T3 after controlling for T1 internalizing problems. Moreover, T1 internalizing problems positively predicted T2 negative affect. Maternal supportive ES was positively associated with prosocial behavior concurrently at T1. The mediational effects of daily affect were not significant. Girls' age was negatively related to their T2 negative affect, $\beta = -.20, p = .006$, and T3 internalizing problems, $\beta = -.35, p < .001$, and positively related to T3 prosocial behavior, $\beta = .19, p = .008$, suggesting that older girls showed less negative affect and internalizing problems but more prosocial behavior.

Next, we tested the effects of maternal ES by examining ER as a mediator (Figure 2). Model modification indices suggested that we should specify the link between T1 internalizing problems and T3 ER in the model. We made this change, and the final model also fit the data well, $\chi^2(50) = 66.34, p = .06$; CFI = .97; RMSEA = .05; SRMR = .06. The results showed that the effect of maternal unsupportive ES on internalizing problems and associations between girls' age and T3 outcomes remained the same as the previous model. Age also was marginally linked to T3 ER, $\beta = .13, p = .07$. Further, T1 maternal supportive ES positively predicted T3 ER after controlling for T1 ER. T1 internalizing problem negatively predicted T3 ER after controlling for T1 ER. The mediational effects of ER were not significant.

Effects of Peer Emotion Socialization

The measurement model with peer supportive and unsupportive latent factors fit the data adequately, $\chi^2(8) = 20.78, p = .01$; CFI = .96; RMSEA = .10; SRMR = .06. To test the effects of peer ES on girls' emotional functioning and adjustment outcomes, we first tested daily positive and negative affect as mediators first (Figure 3). The final model fit the data well, $\chi^2(49) = 65.05, p = .06$; CFI = .96; RMSEA = .05; SRMR = .06. Most of the direct effects and associations were the same as the mother model (Figure 1) except that T1 peer unsupportive ES also negatively predicted T3 prosocial behavior after controlling for T1 prosocial behavior.

The model with ER as a mediator also fit the data well (Figure 4), $\chi^2(49) = 79.97, p = .003$; CFI = .93; RMSEA = .06; SRMR = .07. Most of the effects were the same as the mother model (Figure 2) except that T1 peer ES did not significantly predict T3 girls' ER after controlling for T1 ER, and T1 peer unsupportive ER negatively predicted T3 prosocial behavior after controlling for T1 prosocial behavior. We did not find significant mediational effects of either daily affect or ER, suggesting effects were direct. Interestingly, peer

supportive ES was not significantly associated with peer unsupportive ES, whereas maternal supportive ES was negatively and significantly associated with maternal unsupportive ES.

Discussion

The purpose of this longitudinal investigation was to examine how parent and peer relationships, specifically ES, related to adolescent emotional functioning and adjustment. To test and expand Eisenberg and colleagues' (1998b) heuristic model of ES, we examined how maternal and peer ES were linked to adolescent girls' daily affect and ER and subsequently socioemotional adjustment outcomes. We expanded ES research by including peers as ES agents and by examining girls' daily positive and negative affect intensity as underlying mechanisms using a longitudinal design among a low-income ethnically diverse sample of adolescent girls. In subsequent sections, we first discuss the effects of ES from both mothers and peers, and then discuss the differential effects of maternal and peer ES.

Effects of Maternal ES

Supporting Eisenberg and colleagues (1998b) original model, our findings demonstrated that maternal supportive ES was significantly related to adolescent girls' lower levels of negative affect. Supportive ES also predicted better ER over time, controlling for T1 ER. Our results are consistent with previous findings that maternal supportive ES practices facilitate the alleviation of negative affect and facilitate the development of ER (e.g., Katz & Hunter, 2007; Shortt et al., 2010). Girls from low-income, ethnic diverse backgrounds in the current study reported similar levels of ES compared to previous studies using the same measure as reported by both adolescent girls and boys, who were from samples of mostly European or African American youth and more broader socioeconomic backgrounds (e.g., Klimes-Dougan et al., 2007; O'Neal & Magai, 2005). Similar to inductive discipline, maternal supportive ES may foster the internalization of adaptive emotion regulatory strategies and reduce negative affect (Criss, Morris, et al., 2016). Such supportive reactions from mothers when youth feel negative emotions may help them understand their emotions and problem solve to regulate their emotions when negative events occur.

Consistent with the predictions based on Eisenberg and colleagues (1998b) model, we also found that maternal unsupportive ES significantly predicted more internalizing problems. These findings add to the quite robust evidence that parent unsupportive ES places adolescents at risk for developmental problems, particularly internalizing difficulties (e.g., Brand & Klimes-Dougan, 2010; Klimes-Dougan et al., 2007; O'Neal & Magai, 2005; Shortt et al., 2016; also see Miller-Slough & Dunsmore, 2016 for a review). Maternal unsupportive ES practices such as neglecting and magnifying negative emotions (e.g., anger) and punishing or invalidating a negative emotion (e.g., sadness), may sustain these negative emotions rather than teach girls effective regulatory strategies, which may lead to increases in internalizing problems (e.g., Miller-Slough & Dunsmore, 2018).

Effects of Peer ES

Similar to parent ES models, we found that peer supportive ES significantly predicted girls' lower negative affect. Girls in our sample reported similar levels of peer ES as adolescent

participants did in previous studies (e.g., Borowski et al., 2018; Klimes-Dougan et al., 2014). Our finding adds to the literature that peer supportive ES practices such as providing comfort, helping to solve problems, and cheering friends up when their friends feel sad and angry are effective ways to reduce negative affect. Such peer socialization efforts may be particularly salient among girls given the importance of psychological intimacy during adolescence (Rose, 2002; Rubin et al., 2015). More research is warranted to examine how peer supportive ES contribute to adolescents' daily emotions and the development of ER. Peer unsupportive ES also significantly predicted more internalizing problems across time. This finding is consistent with emerging evidence that unsupportive ES is associated with various internalizing problems (e.g., Klimes-Dougan et al., 2014; Parr et al., 2016; also see Miller-Slough & Dunsmore, 2016 for a review). This finding further suggests that similar to parent unsupportive ES, peer unsupportive ES, particularly punishing or invalidating sadness, neglecting and even magnifying anger, may also put adolescent girls at risk for anxiety and depressive symptoms.

We also found that peer unsupportive ES significantly predicted less prosocial behavior across time. Such unsupportive practices within peer relationships may limit adolescent girls' prosocial tendencies. It is possible that peers' unsupportive ES may lead to youth's reduced empathy, which may lead to less prosocial behavior. Indeed, research has indicated that parent ES is linked to empathy and prosocial behavior particularly among preschoolers and young children (e.g., Taylor et al., 2013). However, research on the link between peer ES and prosocial behavior among adolescents is less common. More research is needed to examine the links between both supportive and unsupportive ES and youth's positive developmental outcomes such as prosocial behavior in the future.

Nonsignificant Findings of Maternal and Peer ES

We did not find significant associations between maternal and peer supportive ES and positive affect, likely because these supportive practices were specifically targeting negative emotions (i.e., anger and sadness) in our sample of adolescent girls from disadvantaged backgrounds. This may suggest that positive relationships with mothers and peers are not sufficient in helping to maintain positive affect among adolescent girls, as biological factors such as hormonal changes also may play important roles in adolescent emotion experiences during adolescence (Steinberg et al., 2006; Steinberg & Morris, 2001). This pattern of findings also could be attributed to our relatively small sample size. Future research with larger sample sizes should continue to examine the association between supportive ES and positive daily emotion experiences of adolescents, particularly among at-risk samples such as ours (e.g., living in poverty, ethnically diverse, single-parent, exposure to high levels of violence).

We did not find significant associations between either mother or peer supportive ES and prosocial behavior or internalizing problems. Some previous studies have found that supportive ES, such as parental emotion coaching, was related to reduced aversive and dysphoric affect during mother-youth interaction (Katz & Hunter, 2007) and that improving parents ES skills reduced adolescents' internalizing problems (Kehoe et al., 2014). However, researchers were not able to control for unsupportive ES in these studies. Our findings

suggest that unsupportive ES may play a more important role in adolescent's psychopathology compared to supportive ES, and this may be true for both maternal and peer ES.

Generally, the indirect effects of maternal and peer ES on outcomes via daily affect and ER were not significant. Most previous studies of ES have been cross-sectional. It is difficult to build mediation models while controlling for previous waves of outcome variables. The nonsignificant links are likely due to our longitudinal design and the time interval (T2 measures were completed soon after the T1 laboratory visit, and T1 and T3 were two years apart). The associations between positive affect and prosocial behavior, negative affect and internalizing problems, and ER and both adjustment outcomes were significant across time without controlling for T1 outcomes. Developmental pathways may be established earlier in life (Morris et al., 2007), and the effects of ES may be difficult to observe across a relatively long (two years in our case) period of time. More carefully designed longitudinal studies are warranted to examine such indirect effects. Nevertheless, it should be noted that the effects of parent and peer ES on adjustment were still significant after two years.

Differential Effects of Maternal and Peer ES

Although peer involvement tends to increase during adolescence (Steinberg, 2011), parents (particularly mothers) continue to influence girls to a large extent across adolescence regardless of their backgrounds (Morris et al., 2013, 2018). Our findings have revealed some differential effects of maternal and peer ES, however, and similar effects on negative affect and internalizing problems. Specifically, we found that maternal supportive ES predicted increases in ER, and peer unsupportive ES predicted decreases in prosocial behavior across two years. These results support the notion that both family and peer relationships likely provide unique and complementary experiences and are critical contexts for development throughout adolescence (Hartup, 1996; Rubin et al., 2015).

Previous studies have indicated that both parent and peer factors were uniquely related to behavioral adjustment when examined simultaneously (Ingoldsby et al., 2006; Lansford, Criss, Pettit, Dodge, & Bates, 2003). This may also be true for maternal and peer ES factors. For example, Tillery and colleagues (2015) examined parent and peer ES in the same model and revealed differential effects on ER and depressive symptoms among young children in a cross-sectional study. However, in our study, maternal and peer ES factors were highly correlated, so we were not able to test unique effects of maternal versus peer ES simultaneously in the same models. Nonetheless, our findings from separate mother and peer models do provide preliminary evidence for differential effects. More longitudinal studies are warranted to examine multiple ES agents among adolescents.

Other Findings

Interestingly, we also found that T1 internalizing problems predicted decreases in ER at T3 and was positively associated with T2 negative affect. This supports the effects of child and adolescent adjustment outcomes on their emotional functioning (e.g., Eisenberg et al., 1998a, 1998b; Morris et al., 2007, 2013). Adolescents suffering from internalizing problems may already have problems managing their emotions, which further contribute to future ER

skills (Morris et al., 2007). We were not able to test effects of adjustment outcomes on parent and peer ES as we did not have ES measures at T3. Future longitudinal studies should continue to test bidirectional effects between ES, emotional functioning, and adjustment (Figure 1). It should be noted that girls' positive and negative affect were positively correlated, which is consistent with other studies of positive and negative affect reported by adolescents (e.g., Briant et al., 2018). This may suggest generally intensive and fluctuating emotions during adolescence (Guyer et al., 2016; Rose, 2002) and that both positive and negative emotions are typical daily affective experiences.

Strengths and Limitations

The current study contributed to the understanding of ES processes by supporting and expanding the significant and innovative heuristic model of ES developed by Eisenberg and her colleagues (1998b). One strength of the study was the inclusion of both maternal and peer ES factors. To the best of our knowledge, very few studies have incorporated comparable ES variables from the parent and peer relationships. In addition, the current investigation contributed to the field by the inclusion of an ecologically-valid measure of adolescent (positive and negative) affect intensity. We also included supportive ES, both positive and negative affect and positive outcomes (i.e., prosocial behavior), to shed light on adolescent positive development, particularly among low-income and ethnically diverse girls. Finally, the current investigation benefited from the longitudinal design.

It should be acknowledged that our findings cannot be generalized to other types of families (e.g., European, middle to upper socioeconomic class), as our sample consisted of predominantly low-income, single parent, and ethnic minority families. Neither can our findings be generalized to adolescent boys or to fathers, as all of our participants were female and most of the primary caregivers were biological mothers. It is possible that different patterns of findings may be found for boys given the sex differences in friendship qualities for different parent-child combinations (e.g., father-daughter, mother-son, father-son), as some research suggests (Cassano & Zeman, 2010; Chaplin et al., 2005; Klimes-Dougan et al., 2007). Thus, future research will benefit from the inclusion of different parent-child pairs, particularly fathers as they may play a critical role in socializing child and adolescents' emotions. Findings should also be interpreted cautiously because all our measures were adolescent self-report, but utilized different methods (i.e., EMA versus self-reports). However, adolescents' perceptions are particularly important when reporting and predicting internalizing problems and emotion regulation (Mussatto et al., 2014).

Conclusions and Implications

Using a predominantly low-income, single parent, and ethnic minority sample, our study suggests that both mothers and peers have important roles in influencing adolescent girls' negative mood on a daily basis and their internalizing problems over time. In general, these findings suggest that educators and practitioners may want to target both parents and peers in teaching youth to use supportive strategies and reduce unsupportive strategies in response to the expression of negative emotions. For example, the Tuning in to Teens program is particularly effective in improving parents' emotion socialization practices and reducing youth internalizing problems (Kehoe et al., 2014). In addition, peers also seem to influence

the effectiveness of programs (see Lansford, 2006 for a review). Involving both parents and peers in programs may be particularly beneficial for the success of prevention and intervention efforts targeting emotion regulation and socio-emotional development (e.g., Baker & Berenbaum, 2008; Gatzke-Kopp, Greenberg, & Bierman, 2015), especially among predominantly low-income, ethnic minority families.

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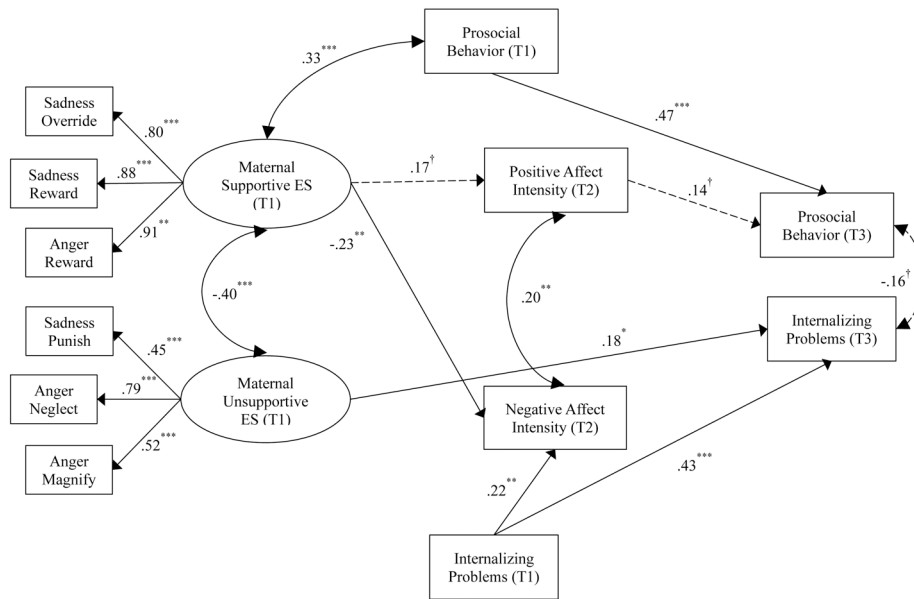


Figure 1. Longitudinal links between maternal ES and girls’ adjustment via positive and negative affect.
Note. All coefficients are standardized. Adolescent age was controlled (results not shown here). Non-significant links were omitted while creating the figure to avoid confusion.
 $^{\dagger} p < .10$. $^* p < .05$. $^{**} p < .01$. $^{***} p < .001$.

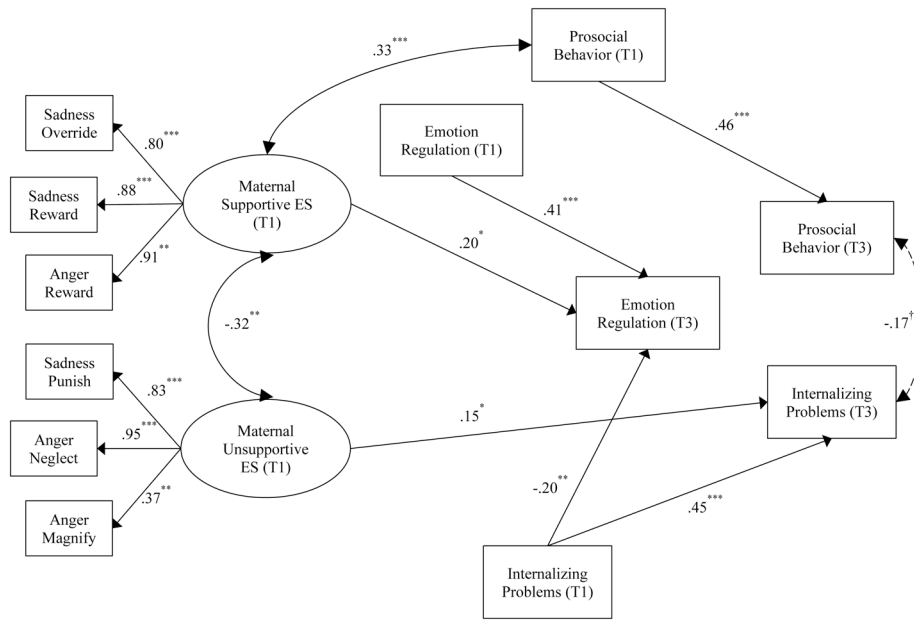


Figure 2. Longitudinal links between maternal ES and girls’ adjustment via ER.
Note. All coefficients are standardized. Adolescent age was controlled (results not shown here). Non-significant links were omitted while creating the figure to avoid confusion.
 $^{\dagger} p < .10$. $* p < .05$. $** p < .01$. $*** p < .001$.

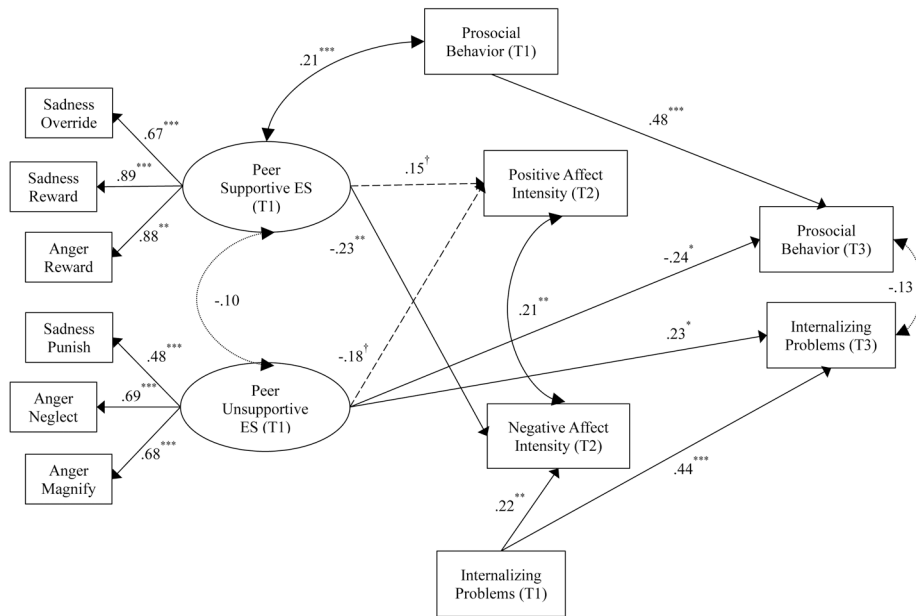


Figure 3. Longitudinal links between peer ES and girls’ adjustment via positive and negative affect. *Note.* All coefficients are standardized. Adolescent age was controlled (results not shown here). Non-significant links were omitted while creating the figure to avoid confusion. † $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

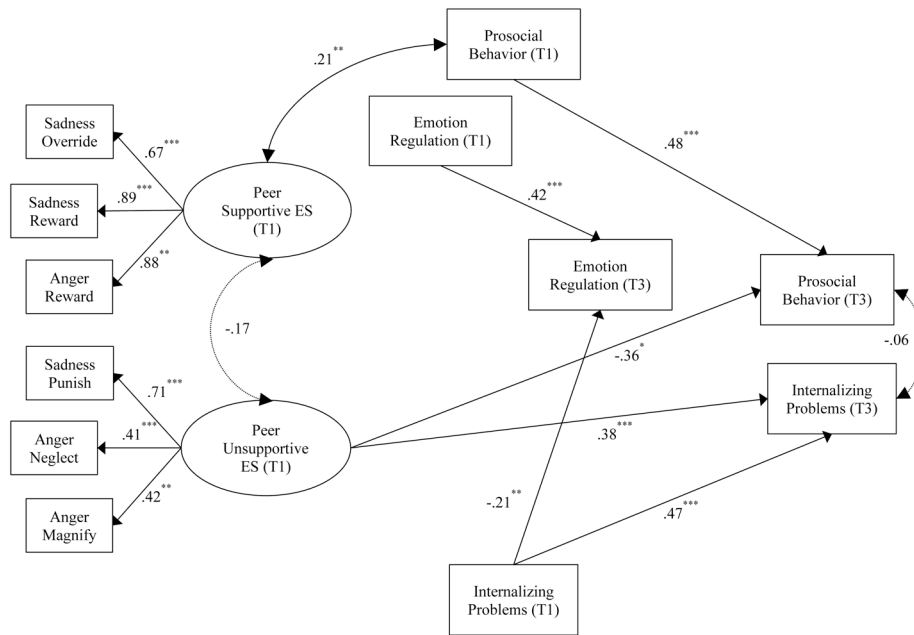


Figure 4. Longitudinal links between peer ES and girls' adjustment via ER.
Note. All coefficients are standardized. Adolescent age was controlled (results not shown here). Non-significant links were omitted while creating the figure to avoid confusion.
 $\dagger p < .10$. $* p < .05$. $** p < .01$. $*** p < .001$.

Table 1

Descriptive analyses and correlations among study variables

	Mean	SD	N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
1. Youth Age	13.51	1.18	160	--																					
2. Maternal Sadness Override (T1)	3.44	1.09	160	-.10	--																				
3. Maternal Sadness Reward (T1)	3.81	1.14	160	.001	.73***	--																			
4. Maternal Sadness Punish (T1)	1.18	0.51	160	.06	-.14 [†] **	-.22**	--																		
5. Maternal Anger Reward (T1)	3.34	1.18	160	-.04	.74***	.79***	-.25**	--																	
6. Maternal Anger Neglect (T1)	1.43	0.68	160	.20*	-.27**	-.32***	.33***	-.28**	--																
7. Maternal Anger Magnify (T1)	1.85	0.88	160	.15 [†]	-.02	-.01	.33***	-.06	.38***	--															
8. Peer Sadness Override (T1)	3.19	0.99	160	.05	.41***	.26**	.03	.34***	-.12	-.01	--														
9. Peer Sadness Reward (T1)	3.83	1.04	160	.08	.36***	.40***	-.12	.35***	-.21**	-.002	.64***	--													
10. Peer Sadness Punish (T1)	1.18	0.54	160	.11	-.01	-.08	.34***	-.14 [†] **	.18*	.09	-.002	-.11	--												
11. Peer Anger Reward (T1)	3.49	1.11	160	.03	.43***	.40***	-.06	.46***	-.20*	-.01	.61***	-.13	--												
12. Peer Anger Neglect (T1)	1.42	0.65	160	-.02	-.09	-.11	.33***	-.11	.39***	.22**	-.06	-.13	.21**	-.05	--										
13. Peer Anger Magnify (T1)	1.59	0.76	160	.06	.01	.02	.27**	-.03	.26**	.35***	.07	.10	.29***	.11	.45***	--									

	Mean	SD	N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
14. Emotion Regulation (T1)	1.07	0.39	157	.15 [†]	.15 [†]	.20 [*]	-.17 [*]	.13	-.05	-.03	.08	.26 ^{**}	.05	.09	-.15 [†]	-1 ⁶	--	--	--	--	--	--	--	--	--
15. Internalizing Problems (T1)	0.94	0.32	157	.10	-.09	.02	.02	.02	.10	.30 ^{***}	-.04	.02	-.04	.03	.01	.17 [*]	-.10	--	--	--	--	--	--	--	--
16. Prosocial Behavior (T1)	1.48	0.48	156	.01	.33 ^{***}	.29 ^{***}	.03	.31 ^{***}	-.16 [*]	.03	.20 [*]	.20 [*]	-.05	.21 ^{***}	-.06	.01	.17 [*]	-.08	--	--	--	--	--	--	--
17. Positive Affect (T2)	2.81	0.74	159	-.1 ⁴	.16 [*]	.12	-.07	.19 [*]	-.10	-.06	.18 [*]	.09	-.16 [*]	.12	-.04	-.0	.12	-.02	.16 [*]	--	--	--	--	--	--
18. Negative Affect (T2)	1.28	0.31	159	-.1 ²	-.19 [*]	-.26 ^{**}	.10	-.22 ^{**}	.10	.10	-.15 [†]	-.21 ^{**}	.001	-.24 ^{**}	.05	.11	-.21 ^{**}	.23 ^{**}	-.10	.16 [*]	--	--	--	--	--
19. Emotion Regulation (T3)	1.15	0.43	129	.18 [*]	.20 [*]	.25 ^{**}	.05	.24 ^{**}	-.04	-.04	.16 [†]	.13	-.02	.16 [†]	-.08	-.2 ⁰	.46 ^{***}	-.20 [*]	.28 ^{**}	.21 [*]	-.30 ^{**}	--	--	--	--
20. Internalizing Problems (T3)	0.54	0.37	129	-.1 ⁴	-.12	-.06	.10	-.07	.15 [†]	.16 [†]	-.04	-.04	.14	-.05	.11	.12	-.05	.51 ^{***}	-.13	.07	.28 ^{**}	-.28 ^{**}	--	--	--
21. Prosocial Behavior (T3)	1.59	0.43	129	.15 [†]	.17 [†]	.15 [†]	-.05	.13	-.13	.001	.09	.12	-.10	.08	-.16 [†]	-.1	.14	-.16 [†]	.53 ^{***}	.20 [*]	-.14 ^{**}	.26 ^{**}	-.1 ⁹	--	

Note. Youth age was a continuous variable. Skewness ranged from $-.91$ to 1.88 and kurtosis ranged from -1.06 to 1.95 (within the acceptable range of -2 to 2).

[†] $p < .10$.

* $p < .05$.

** $p < .01$.

*** $p < .001$.