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## Abstract

Mounting research supports that co-rumination, the tendency to seek peer support by engaging in extensive negatively focused discussion, is a risk factor for adolescent psychopathology. It is unclear, though, how this interpersonal tendency develops. Parental responses to adolescents' negative affect likely shape how youth utilize peer relationships to regulate distress, as they shift to reliance on peer support during this developmental stage. For example, nonsupportive parental responses may fail to instill healthy regulation strategies, resulting in ineffective forms of peer support, such as co-rumination. Conversely, high levels of supportive parental responses to adolescents' negative affect may motivate youth to also express more negative affect with peers, leading to co-rumination. Eighty-nine healthy adolescents (9-17) and their mothers completed surveys and a support-seeking interaction. Only supportive maternal responses, including maternal

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affection, were associated with adolescents' co-rumination. These analyses indicate that some forms of parental support are associated with adolescents' tendency to co-ruminate.

**Keywords**

parent-adolescent relationships, parenting processes/practices, emotion regulation, peers, risk/resilience

Co-ruminating with peers, or the tendency to engage in extensive, negatively focused discussion regarding reactions to ongoing problems (Rose, 2002), has been implicated in multiple psychosocial difficulties in adolescence, including clinical episodes and symptoms of depression (Hankin, Stone, & Wright, 2010; Rose, Carlson, & Waller, 2007; Stone, Hankin, Gibb, & Abela, 2011), social anxiety (Jose, Wilkins, & Spendelov, 2012), interpersonal stressors, peer aggression, and lower social acceptance (Hankin et al., 2010; Tompkins, Hockett, Abraibesh, & Witt, 2011) in community samples. Co-rumination appears to increase risk for internalized distress by fostering rumination (Stone & Gibb, 2015), which in turn serves to amplify negative moods and thoughts (Whitmer & Gotlib, 2013). Yet, it remains unclear how this interpersonal tendency develops, which is critical for informing prevention efforts. Recent results indicate that co-rumination functions as an emotion regulation strategy that adolescents resort to when distressed (Waller, Silk, Stone, & Dahl, 2014). Therefore, the current study examined how parents may socialize adolescents to adopt this particular regulation strategy, by linking parental responses to adolescents' negative affect and support seeking with their tendency to seek peer support via co-rumination.

Emotion regulation refers to the processes by which individuals modify their internal emotional states in order to achieve external goals (Thompson, 1994). This capacity develops across childhood, with parents playing a vital role in helping youth learn to manage their distress (Eisenberg & Morris, 2002). Specifically, the ways that parents respond to and discuss emotions shape children's understanding of appropriate emotional expression and expectations for parental support (Eisenberg, Cumberland, & Spinrad, 1998). The attachment literature supports that this process begins in infancy (Cassidy & Shaver, 1999). Across childhood, youth increasingly develop the skills to self-regulate independently (Eisenberg & Morris, 2002) but continue to seek support to regulate distress. In adolescence, a social transition occurs, whereby youth shift to relying on peers for companionship and feedback (Bukowski, Newcomb, & Hartup, 1996; Furman & Buhrmester, 1992). Thus,

peer support has a salient influence on affective development during this period. Parental responses shape youth's emotion regulation strategies within the parent-child relationship (Morris, Silk, Steinberg, Myers, & Robinson, 2007), but it is unclear how parental socialization may influence adolescents' regulation with peers. Understanding how parental responses contribute to this key transition may be vital for advancing interventions that help youth establish healthy support strategies with peers.

Research has largely focused on the impact of nonsupportive parental responses to children's negative affect. "Emotion dismissing" reactions (Gottman, Katz, & Hooven, 1996) include critical, punitive, mocking, or dismissive responses. Nonsupportive responses are associated with poorer emotion regulation in childhood (Eisenberg & Fabes, 1994; Eisenberg, Fabes, Carlo, & Karbon, 1992; Eisenberg, Fabes, & Murphy, 1996), presumably because these interactions fail to provide exposure to adaptive strategies (e.g., problem solving) and inhibit emotional expression and future support seeking with parents (Eisenberg et al., 1998). Similarly, in adolescence, maternal aggression (e.g., angry affective expression, combative replies) is also predictive of anxiety and depression (Schwartz et al., 2014; Schwartz et al., 2012). Thus, nonsupportive parental responses may encourage adolescents to seek support elsewhere, for example, with peers. In turn, the lack of adaptive experiential learning in nonsupportive parent-child interactions may account for adolescents' ineffective support-seeking strategies with peers, such as co-rumination. Thus, we hypothesized (H1) that nonsupportive parental responses to adolescents' negative affect would be positively associated with co-rumination, such that greater nonsupportive parental responses would be associated with a higher tendency to co-ruminate with peers.

Conversely, there is also reason to suspect that supportive parental responses to negative affect may inadvertently foster co-rumination. These "emotion coaching" strategies (Gottman et al., 1996a; comforting, encouraging emotional expression, teaching constructive coping such as problem solving) are predictive of adaptive emotion regulation, especially in early childhood (Eisenberg & Fabes, 1994; Eisenberg et al., 1996; Shortt, Stoolmiller, Smith-Shine, Eddy, & Sheeber, 2010), as these interactions presumably encourage appropriate emotional expression and support seeking. However, there is also evidence that *more* support is not necessarily better. Relative to moderate levels, both *high* and low levels of parental encouragement of negative emotional expression have been linked with children's poorer emotion regulation and adjustment (Roberts & Strayer, 1987). Similarly, another study found calm or neutral parental responses to be the most beneficial (Denham, 1993). Taken together, these studies indicate that there may be an optimal level of parental support for allowing, but not

encouraging, negative emotional expression and support seeking (Morris et al., 2007). One possibility is that high levels of parental support serves to socially reward youth's distress rather than their attempts to confront problems. If this is the case, supportive parental interactions may encourage negative affect expression and support seeking, and generalize to peers in adolescence via strategies that also elicit social rewards. Co-rumination provides ample means for validating distress and also increases friendship quality and closeness (Rose et al., 2007). There is less clarity on what amount of parental support is ideal in adolescence, but based on the curvilinear findings in childhood, we tested both linear and curvilinear associations with co-rumination. We hypothesized that in linear form (H2a), rates of co-rumination would increase with higher parental support. In curvilinear form (H2b), moderate amounts of support would be linked with less co-rumination, whereas rates of co-rumination would increase in the context of both high *and* low parental support.

In examining the link between co-rumination and parental responses, we also considered the potential moderating effect of age given that reliance on peers and rates of co-rumination (Furman & Buhrmester, 1992; Hankin et al., 2010; Rose, 2002) increase across adolescence. Thus, we hypothesized (H3) that parental responses would be more strongly associated with co-rumination among older adolescents. Hypotheses were tested in a sample of healthy adolescents and their mothers. We employed a multi-informant, multi-method approach with behavioral observation of mother-adolescent dyads' live interaction. Finally, to ensure that significant findings were specific to co-rumination, sensitivity analyses were also conducted by covarying for adolescent affect and internalizing symptoms.

## Method

### *Participants and Procedure*

Eighty-nine healthy adolescents (52 female; ages 9-17) and their mothers participated in a larger study on emotional development. Exclusion criteria for this sample included (a) Axis I psychiatric disorder, (b) major medical illness, (c) history of serious head injury, and (d) uncorrected vision difficulties (for computer tasks unrelated to current analyses). Most adolescents were Caucasian (78%), with 16% African American, 2% Asian American, 4% classified as biracial or "Other," and 1% Hispanic. Some adolescents (26%) were from single-parent households. Most mothers had pursued or completed college or university training.

Participants were recruited from community advertisements and research registries. Mothers completed a phone screen followed by two laboratory visits

with their adolescent. The current, cross-sectional analyses focus on data collected during the first visit. After informed consent and assent were obtained, parents and adolescents completed questionnaires and then behavioral interaction tasks (parent-adolescent discussions). All research procedures were approved by the University of Pittsburgh's institutional review board.

### Psychiatric Screen

Mothers completed a survey that assessed their adolescent's behavior across 17 categories related to *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM-IV*; American Psychiatric Association, 1994) diagnoses: either the *Adolescent Symptom Inventory 4* (ASI-4) for youth  $\geq 12$  (Gadow & Sprafkin, 1998a) or the *Child Symptom Inventory 4* (CSI-4) for youth  $< 12$  (Gadow & Sprafkin, 1998b). The ASI-4 and CSI-4 demonstrate convergent and discriminant validity with clinician diagnoses. Families who reported elevated symptoms on the ASI-4 or CSI-4 then completed the *Schedule for Affective Disorders and Schizophrenia for School-Age Children, Present and Lifetime Version* (K-SADS-PL; Kaufman, Birmaher, Brent, Rao, & Ryan, 1996), a semi-structured interview that yields reliable Axis I diagnoses. Adolescents who met criteria for a current clinical diagnosis were excluded from this normative sample.

### Adolescents' Self-Report of Co-Rumination and Depressive Symptoms

The Co-Rumination Questionnaire (CRQ; Rose, 2002) assesses the extent to which adolescents co-ruminate with their closest same-sex friend. Adolescents responded to 27 items using a 5-point Likert-type scale ranging from *not at all true* (1) to *really true* (5). For example, "If one of us has a problem, we will spend our time together talking about it, no matter what else we could do instead." Co-rumination was calculated by averaging across all items. The CRQ has exhibited excellent psychometric properties in community samples (Rose, 2002; Rose et al., 2007), and strong internal reliability in the current study ( $\alpha = .97$ ).

The *Mood and Feelings Questionnaire* (MFQ; Angold, Erkanli, Silberg, Eaves, & Costello, 2002) was used as an established measure of youth's current depressive symptoms with excellent psychometric properties ( $\alpha = .92$ ).

### Maternal Report of Affect Responsiveness

The Emotion Socialization Measure (ESM; Klimes-Dougan et al., 2007), which was previously adapted from Magai's (1996) *Emotions as a Child* scale

(EAC), was used to assess mothers' responses to their child's expression of sadness, anger, and fear. Evidence of the ESM's reliability and validity has been documented in similar, low-risk community samples (Klimes-Dougan, Brand, & Garside, 2001; Klimes-Dougan et al., 2007). Mothers report how they typically respond to their adolescents' emotions on a Likert-type scale (1 = *not at all*, 5 = *very much*). Five strategies are assessed: *reward* (providing comfort or constructive coping), *punish* (expressing disapproval), *neglect* (ignoring emotional expression), *override* (dismissive or distracting), and *magnify* (parent matches child's affect). In the current study, three of the five strategies were utilized to test hypotheses (Override and Magnify subscales did not directly align with hypotheses and were not included in analyses). Specifically, the Reward subscale provided a general measure of supportive parental responses (hereafter termed "maternal support"): "When your child was sad (or angry/afraid), how often did you comfort him or her" or "help him or her deal with the issue." The Punish and Neglect subscales, which are both conceptualized as negative responses, were combined (averaged) to provide a measure of "maternal nonsupport": ". . . how often did you show him or her that you did NOT like them being sad (or angry/afraid)." Internal consistency was robust for maternal support across all three emotions ( $\alpha = .75-.83$ ). Maternal nonsupport exhibited more modest reliability for anger and fear ( $\alpha = .66-.64$ ). Maternal nonsupport of sadness was excluded from analyses due to poor internal consistency ( $\alpha = .49$ ).

### ***Behavioral Observation of Maternal Affect Responsiveness***

Maternal affect was assessed during an 8-minute supportive discussion task (see Gilliom, Shaw, Beck, Schonberg, & Lukon, 2002). Adolescents selected a problem that they wanted their mother's help solving. Then the dyad was asked to discuss the issue as a problem the adolescent wanted support with. Although this task was designed to elicit supportive behaviors, it can also elicit a range of negative affect in families (e.g., parental expressions of frustration, irritation, and disappointment). Maternal affect was coded from videotaped observations on a second-by-second basis using a version of the Specific Affect coding system (SPAFF) that was adapted for parent-adolescent interactions (Gottman, McCoy, Coan, & Collier, 1996). Each affect code is based on facial expressions, gestures, posture, voice tone, and speech rate that capture the overall affective tone of each second. SPAFF coders were extensively trained. Approximately 25% of the interactions were coded by a master coder to estimate observer agreement, and weekly calibration meetings were held to avoid coder drift. Internal reliability, which was calculated continuously over the coding period, was excellent ( $\kappa = .92$ ).

In the current study, maternal affection provided a measure of maternal support, expressed via statements of love, caring, reassurance, concern, empathy, or physical touch. The base rate of each negative affect was low, which is typical of laboratory interactions (Snyder, Stoolmiller, Wilson, & Yamamoto, 2003). Thus, to index maternal nonsupport, a summary of time mothers spent expressing any negative affect was used (contempt, anger, fear/anxiety, sad/withdrawn, and whine/complain). Of the 89 mothers, 56% expressed negative affect, and 40% expressed affection. The expression of one variable did not predict the presence or absence of the other,  $\chi^2(89) = 0.10, p = .92$ . A summary variable was also created for adolescents' expression of negative affect.

## Results

Data were missing on the self-report surveys (CRQ, 9%; ESM, 10%; MFQ 4%), so we first examined if data were missing at random to justify estimation of missing values (Schafer & Graham, 2002). Little's missing completely at random (MCAR) test was non-significant,  $\chi^2(104) = 109.561, p = .34$ , supporting the imputation of missing values (Little & Rubin, 1987). Thus, maximum likelihood estimates of missing data were created and used in all analyses (Schafer & Graham, 2002). Analyses were conducted via step-wise multivariate regressions. The primary predictor (maternal response variable) was entered on Step 1, and demographic covariates (age, gender, and race) were entered on Step 2. Descriptive statistics and main effects with co-rumination (Step 1) are presented in Table 1. Final associations (Step 2) are reported below.

As can be seen in Table 1, results did not support our first hypothesis. Co-rumination was not significantly associated with any of the maternal nonsupport variables. We proceeded to test linear (H2a) and curvilinear (H2b) associations between co-rumination and maternal support by entering both linear and quadratic forms of the maternal variable on Step 1. Support for a curvilinear effect is found when the quadratic predictor is significant (accounts for unique variance above and beyond the effects of the linear predictor). Of the four maternal support variables, none of the quadratic predictors were statistically significant (lowest  $p = .121$ ), and thus, they were removed from each model. In support of H2a, maternal support of adolescents' expression of sadness and anger, and maternal affection were linearly associated with adolescents' co-rumination in the hypothesized direction (Table 1). Testing the strength of these effects (with covariates on Step 2), we found that maternal support in response to sadness,  $\beta = .25, t(84) = 2.40, p = .019$ , and maternal affection,  $\beta = .26, t(84) = 2.45, p = .016$ , maintained significance. The association with adolescents' expression of anger was reduced to non-significance,  $\beta = .206, t(84) = 1.93, p = .057$ .



**Table 1.** Descriptive Statistics.

| Variables                              | Range      | $\bar{X}$ | SD    | Gender<br><i>t</i> / $\chi^2$ | Age<br><i>r</i> / <i>t</i> | $\beta$ |
|--|------------|-----------|-------|-------------------------------|----------------------------|---------|
| Adolescent co-rumination               | 1.00-4.70  | 2.27      | 0.83  | -0.36                         | .04                        | —       |
| Maternal support sad                   | 8.00-15.00 | 13.39     | 1.74  | 0.00                          | -.02                       | .22*    |
| Maternal support angry                 | 8.00-15.00 | 12.25     | 2.06  | -0.49                         | >.01                       | .21*    |
| Maternal support afraid                | 8.00-15.00 | 12.56     | 2.17  | -0.58                         | -.10                       | .17     |
| Maternal expression of affection       | 0.00-85.54 | 6.80      | 15.23 | 0.74                          | -.45                       | .21*    |
| Maternal nonsupport angry              | 6.00-14.00 | 8.66      | 2.48  | -2.10*                        | .04                        | -.13    |
| Maternal nonsupport afraid             | 6.00-14.00 | 7.58      | 2.01  | -0.51                         | .09                        | -.06    |
| Maternal expression of negative affect | 0.00-94.06 | 4.49      | 11.13 | 0.60                          | .46                        | -.14    |

Note. Maternal support indices = Emotion Socialization Measure, Reward subscale. Maternal nonsupport indices = Emotion Socialization Measure, Sum of Neglect and Punish subscales. Maternal expression of affection and negative affect = dichotomized SPAFF codes of dyadic interactions (present = 1, absent = 0). Gender Boys = 0, Girls = 1.  $\beta$  = bivariate associations between primary predictors and co-rumination (Step 1 of multivariate regressions). SPAFF = Specific Affect coding system.

\* $p < .05$ .

We next conducted sensitivity tests of both significant predictors to ensure effects were specific to co-rumination. Maternal support of sadness maintained significance when also covarying for adolescents' expression of negative affect,  $\beta = .22$ ,  $t(83) = 2.07$ ,  $p = .042$ , and depressive symptoms,  $\beta = .25$ ,  $t(83) = 2.45$ ,  $p = .017$ . Maternal affection also exhibited unique effects when covarying for adolescents' negative affect,  $\beta = .24$ ,  $t(83) = 2.29$ ,  $p = .025$ , and depressive symptoms,  $\beta = .23$ ,  $t(83) = 2.16$ ,  $p = .034$ .

Finally, we tested whether age moderated the effect of maternal response on co-rumination (H3) by centering adolescents' age as a continuous variable and adding the interaction term on Step 2 (Age  $\times$  Maternal Response). Adolescents' age did not moderate any of the associations between maternal response variables and co-rumination (lowest  $p = .188$ ).

## Discussion

The current study examined whether maternal responses to adolescents' expressions of negative emotions and support seeking were associated with adolescents' tendency to co-ruminate with peers. Supportive maternal

responses were linearly associated with higher co-rumination (H2a). Importantly, this finding was consistent across multiple indices (maternal report of support in response to sadness and behavioral observation of maternal affection), and both associations were maintained after the inclusion of covariates. In contrast, results did not support an association between non-supportive maternal responses and co-rumination (H1).

The interpretation and potential implications of the current pattern of findings warrant careful consideration. First, it is noteworthy that there is a substantial literature supporting the benefits of positive parental responses on emotion regulation and adjustment, particularly in early childhood (e.g., Shortt et al., 2010; for review, see Eisenberg et al., 1998). Thus, we do *not* believe that positive responses are harmful or that parents should not respond supportively to their adolescents. Rather, the current results contribute to a growing body of literature indicating potential developmental differences in the qualitative versus quantitative effects of parental support during early childhood (quantitative) versus adolescence (qualitative). The association found between maternal support and co-rumination was not moderated by age (H3) in the current sample (spanning early to mid-adolescence), suggesting a positive linear association between maternal support and co-rumination across adolescence. This finding contrasts with prior research in *early childhood* supporting a curvilinear association. Whereas high (Mount, Crockenberg, J6, & Wagar, 2010) and low levels of parental encouragement of young children's expression of negative affect have been linked with poorer emotion regulation and adjustment, moderate levels of encouragement and neutral responses have been found to be beneficial (Denham, 1993; Roberts & Strayer, 1987). Given these prior results, it is somewhat surprising that the associations between maternal support and co-rumination in the current adolescent sample were not also curvilinear. One explanation is that there are developmental differences in adaptive parental support, such that for young children, there is an optimal level or *quantity* of support for encouraging emotional expression and helping youth identify and understand their emotions. For older children and adolescents, though, the *quality* or type of support provided may be more critical. Taken at face value, the current linear association suggests that greater parental support in adolescence is detrimental. We propose that this interpretation is likely too simplistic and dangerously misleading. The *type* of parental support given to adolescents is likely to yield a stronger predictor of adjustment. That is, parental support that emphasizes constructive coping (problem solving) may assist adolescents' transition to navigating conflicts more effectively (Eisenberg et al., 1998). Initial evidence supports this link between parental problem solving and adaptive emotion regulation in older youth (Sheeber, Allen, Davis, & Sorensen, 2000).

Emphasizing constructive coping may be especially relevant to co-rumination. First, it is worth noting that co-rumination has adaptive components: emotional expression and support seeking are typically considered adaptive regulation strategies (Connor-Smith, Compas, Wadsworth, Thomsen, & Saltzman, 2000). However, co-ruminators appear to get stuck at the support-seeking stage. Using peer interactions to repeatedly seek validation and comfort may feel like active attempts to problem-solve, and relieve distress momentarily. But ultimately, co-rumination may be best characterized as an avoidance strategy, whereby problems are rehashed rather than confronted. This would account for the adjustment trade-offs of co-ruminating. The negative, intimate interactions are socially reinforced via friendship quality (Rose et al., 2007). Meanwhile, ruminating in isolation occurs in an effort to maintain prior distress relief but serves to increase problems and internalizing symptoms (Hankin et al., 2010).

Therefore, in addition to emphasizing constructive coping with parents, another clinical implication to discourage co-rumination is that parental support should occur non-contingently. Contingent parental support, which only occurs in response to adolescents' distress, may also encourage youth's negative emotional expression and dysregulation (Sheeber et al., 2000). If this is the case, adaptive parental support would emphasize constructive coping when adolescents' are distressed, but would also include support in the forms of affection and comfort across contexts (when adolescents are calm as well as distressed). Risky parental support would emphasize affection and comfort that primarily occurs only when adolescents are distressed. However, the measure of maternal support in the current study was a general index consisting of both comfort and problem-solving items. Longitudinal work that can disentangle the effects and contexts of specific parental responses is needed to test these risky versus adaptive parenting models.

The current study benefited from multi-informant assessments as well as behavioral observation of parent-adolescent discussions. However, several limitations should be noted. First, the large age range and small sample size may have limited our power to detect moderation effects. Furthermore, focusing on a healthy adolescent sample makes it likely that the entire range of co-rumination was not represented. For example, adolescents meeting criteria for a depressive disorder were excluded from this sample: this may have also excluded the highest co-ruminators. In addition, we focused specifically on maternal responses to adolescents' expression of negative affect, as co-rumination is comprised of negative self-disclosure, but dampening maternal responses to adolescents' positive affect have also been linked with dysregulation and depression risk (e.g., Schwartz et al., 2014; Yap, Allen, & Ladouceur, 2008), and thus may also impact social regulation strategies.

Another consideration is that we were not able to consider the role of maternal psychopathology. As depressed mothers exhibit more negative and less positive responses to children's negative affect (Goodman, 2007; Silk et al., 2011), it is possible that parental socialization of co-rumination may differ between youth of healthy versus depressed mothers. Finally, the current study's cross-sectional design limited the capacity to test a broader model for how parental socialization of emotion predicts adolescents' social regulation strategies with peers. Longitudinal research is needed to test directional effects of how adaptive parental responses may foster co-rumination with peers, and explore these potential moderators.

In summary, the current results provide preliminary evidence that maternal responses to adolescents' distress and support seeking may predict how they regulate distress with peers. Higher levels of maternal support may inadvertently socialize adolescents to co-ruminate. Potential implications are that parents should provide consistent support (particularly via constructive coping strategies) that is not contingent on adolescents' expression of negative affect. However, longitudinal examinations on how maternal support affects youth's negative affect expression and support seeking across childhood and adolescence with parents, to predict co-rumination with peers, are warranted to inform clinical implications.

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