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Specific Pathways from Parental Distress Reactions to Adolescent Depressive Symptoms: The Mediating Role of Youths' Reactions to Negative Life Events

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Abstract

The current multimethod longitudinal study examines how parents' distress reactions to adolescents' negative emotions may shape youths' own perceptions of negative life events and subsequent increases in depressive symptomology. Ninety adolescents (41 girls, 49 boys, average age = 16.5 years old) and their parents were assessed over three timepoints. We found that greater parent-reported distress reactions to adolescents' emotions predicted subsequent increase in youths' own self-reported negative reactions to stressful experiences over a two-week period, which in turn predicted steeper increases in youth-reported depressive symptoms across this same two-week period. Moreover, youths' negative reactions mediated the relation between parent emotion socialization and increases in adolescent depressive symptoms. These findings support the use of interventions that simultaneously target parent and child distress to prevent the onset of adolescent depression.

Keywords Depressive symptoms · Distress reactions · Parent emotion socialization · Adolescence · Negative life events

Introduction

Rates of depressive symptoms rise steeply during adolescence (Shore et al., 2018) and are linked to myriad negative mental and physical health outcomes across the lifespan, including serious mental illness (Johnson et al., 2009), substance use (Felton et al., 2015), and both suicidal ideation and behaviors (Wild et al., 2004). Central to the onset of depressive symptoms during this developmental period are concomitant changes in the capacity to regulate emotions in response to negative life events, influencing the subjective and behavioral responses youth have to stress in their environment (Powers & Casey, 2015). Leading theories of the development of depression suggest that adolescents who are unable to effectively moderate these affective responses to common stressors are consequently at heightened risk for developing depressive disorders (e.g. Hankin & Abramson, 2001; Hilt & Nolen-Hoeksema, 2009).

The frequency of exposure to negative life events also appears to increase during adolescence (Shortt & Spence, 2006), placing greater demands on youths' developing abilities to regulate their emotional responses. For adolescents with an impaired capacity to tolerate the distress associated with these events, higher rates of exposure to stressors in the environment have been shown to predict increases in

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depressive symptoms across middle and late adolescence (Felton et al., 2019). Thus, identifying specific vulnerabilities that place adolescents at risk for responding more negatively to environmental stressors is critical for appropriately targeting depression prevention efforts. The current paper examines one such pathway to the onset of depressive symptoms by evaluating the role of parents' own distress in reaction to adolescents' negative affect and its subsequent impact on adolescents' negative reactions to life events.

Parent Emotion Socialization, Child Distress, and Youth Depression

Both theory and empirical research support the critical role that parents play in the development of depressive symptoms during adolescence (Schwartz et al., 2017). One way that parents exert influence over the onset of psychopathology during this developmental period is through *parent emotion socialization* (Eisenberg et al., 1998). Parent emotion socialization broadly includes the various ways in which parents teach and coach their children around experiences of emotion. Emotion socialization shapes youths' own experience of emotions, including their ability to identify, express, and regulate their affective experiences (Chronis-Tuscano et al., 2021; Eisenberg et al., 1998). One key element of parent emotion socialization that shows strong links to adolescent psychopathology is parents' reactions to youths' negative emotions. Models of emotion socialization suggest that parents serve as youths' first and most salient example of adaptive and maladaptive responses to distressing affect (Halberstadt, 1991; Silk, 2019). Youth, in turn, may then act out these responses when exposed to distressing events in their own lives. A robust literature suggests that parents who respond to youths' negative affect with supportive emotion socialization (such as encouraging affective expression or focusing on problem- or emotion-related coping) promote better emotion regulation skills among their children (e.g. Morris et al., 2017). Conversely, children of parents who express non-supportive reactions (including minimizing the child's experience or reacting punitively) are more likely to have difficulty regulating their affective response to distress in their own environments (e.g. Fabes et al., 2002; Kerns et al., 2017; Shaffer et al., 2012), which may have subsequent implications for the onset of depressive symptoms. Indeed, a review of research on this topic found that youth whose parents respond to their negative emotions in a non-supportive manner evidenced greater rates of depressive symptoms across adolescence (Schwartz et al., 2012).

Parents who respond to youths' negative emotions by expressing elevated levels of distress specifically [referred to by Fabes et al. (2002) as a *distress reaction*] may teach youth to experience and display similar elevations in distress in response to stressful life events in their environments. Importantly, factor analytic work suggests that these types of distress reactions represent a conceptually distinct facet of parental emotion socialization from other types of non-supportive parental reactions (Fabes et al., 2002). Compared to literature examining the effects of broader domains of supportive and non-supportive reactions, however, less research has focused explicitly on the consequences of parents' distress reactions. Of the studies that have examined the effects of parents' distress reactions, most have found that parental distress reactions negatively impact youths' ability to regulate their affective response to negative stimuli (e.g. Fabes et al., 2002; Park et al., 2012). For instance, one longitudinal study of 94 preschoolers and their parents found that parent-reported distress responses predicted youths' own regulation two years later (assessed by parent report), highlighting the critical role parents' distress plays in early emotional development (Eisenberg et al., 1999).

The link between parental distress reactions and the development of youths' depressive symptoms, however, is less clear. Some research has failed to find relations between parental distress responses and youth depressive symptoms. For instance, the longitudinal study of preschoolers described above found that while parents' distress reactions were correlated with parents' reports of child internalizing problems (including anxiety and depression) both cross-sectionally and across timepoints, parental distress did not predict *changes* in youths' subsequent internalizing symptoms, suggesting no support for causal links between these constructs (Eisenberg et al., 1999). A more nuanced relation between parental socialization and depressive symptomology emerges in other research. For example, in a sample of children ages 7–12, Suveg et al. (2011) did not find a bivariate relation between parents' unsupportive parenting (including distress reactions) and child internalizing symptoms; however, the authors did find a significant indirect effect of parental psychopathology on child internalizing via children's emotion regulation that was moderated by parent emotion socialization. Interestingly, the indirect pathway was strongest for mothers who reported lower levels of unsupportive parenting reactions. Finally, others have found that the frequency with which mothers' recall of their own "magnifying" or reacting to youths' emotions with heightened levels of distress was the only emotion socialization scale that predicted greater internalizing symptoms for emerging adults (Faro et al., 2019).

Parental Distress Reactions and the Development of Adolescent Depressive Symptoms

Importantly, the majority of research examining relations between parental distress responses, youths' own reaction to stress, and subsequent depressive symptoms has been conducted on younger children (Morris et al., 2007; c.f.

Cummings et al., 2013; Remmes & Ehrenreich-May, 2014; Klimes-Dougan et al., 2007), preceding the period of precipitous increases in depressive symptoms (Costello et al., 2006). Despite adolescence being a period during which teens begin to differentiate from their families, research suggests that parent emotion socialization continues to contribute to adolescents' emotional development in important ways (see Morris et al., 2007 for a review). Broadly, non-supportive parental reactions to adolescents' negative emotions have been shown to be associated with decreases in adolescent emotion regulation capacity and increases in the incidence of adolescent emotional and behavioral problems (Buckholdt et al., 2014; Hastings et al., 2014; Klimes-Dougan et al., 2007), while supportive parenting may buffer the impact of adolescents' ability to regulate distress (Fox et al., 2019) and subsequent internalizing pathology (Desjardins & Leadbeater, 2011; Katz et al., 2014).

Even fewer studies have examined the role of parental distress responses specifically across adolescence and their association with youths' emotional responses to environmental stressors. Of the limited literature that has evaluated these relations, parental distress appears to drive adolescents' responses to real-world stressful situations. For example, Martin et al. (2018) found that adolescents whose mothers responded to youths' negative emotions with greater personal distress had more overall difficulties with emotion regulation and were also less likely to disclose substantive details regarding a recent negative life event to their parent, which has been associated with greater risk for negative mental health outcomes (Fiering et al., 1999).

Considered together, the extant literature provides compelling (although sparse) preliminary evidence to suggest that parents' distress reactions to negative emotions may impact youths' own affective responses to negative life events. This, in turn, may represent an important pathway to the onset of adolescent depressive symptoms. However, these studies are largely limited by a number of methodological and conceptual shortcomings that prevent drawing causal inferences regarding these relations. First, although the field widely concurs that parenting behaviors fall along a number of non-orthogonal dimensions (e.g. Fabes et al., 2002; Maccoby & Martin, 1983), many studies collapse across positive and negative parenting behaviors, which prevents drawing more nuanced conclusions regarding the effects of specific domains of parenting (such as parental distress reactions). For instance, models of emotion socialization suggest that parents who respond to their children's negative emotions with personal distress may increase the likelihood of youth experiencing more extreme negative emotions in response to environmental stressors. However, these relations have not yet been examined during adolescence, despite adolescence being a critical period for the onset of depressive symptoms (Avenevoli et al., 2015) and youths' distress being an important indicator of depression (Ho, 2019; McMahon et al., 2003). Second, the field has largely relied on cross-sectional methods (e.g. Buckholdt et al., 2014; Klimes-Dougan et al., 2007) which are unable to disentangle the temporal precedence of these constructs. Longitudinal research is therefore needed to determine whether parents' distress reactions are predictive of future adolescent depressive symptoms, as opposed to pathways by which youths' depressive symptoms engender higher levels of parental distress (e.g. Schwartz et al., 2012). Third, most studies in this field have relied on single informant reports of parents' emotional reactions and youths' clinical outcomes (e.g. Eisenberg et al., 1999; Shaffer et al., 2012). Utilizing single parent- or child-reports introduces concerns regarding monomethod variance and reporter bias that may erroneously inflate the relation among these constructs. Fourth, many studies fail to consider the role of parent psychopathology. Given evidence suggesting that genetic effects are a substantial contributor to the onset of depressive symptoms during adolescence (Goodman, 2020), it is important to understand factors above and beyond the heritability of symptomology. Finally, the majority of studies examining the emotional impact of parent emotion socialization on youth have focused on broad emotion regulation capabilities (e.g. Zeman et al., 2013) rather than examining youths' reactions to specific stressors in the environment, a potentially more ecologically valid approach and which may relate more directly to risk for depression.

Current Study The current study attempts to address a number of these limitations in the extant literature by examining how parents' distress reactions to youths' negative emotions are associated with adolescents' negative reactions to life events and subsequent changes in depressive symptoms over time/across adolescence (controlling for parents' own depressive symptoms). First, we sought to examine how adolescents responded to negative life events and whether more negatively valanced reactions predicted increases in depressive symptoms over a two-week period. We hypothesized that adolescents who reported experiencing more extreme negative reactions to life events across those two-weeks would evidence steeper increases in depressive symptoms during that same period. Our second goal was to extend the current emotion socialization literature by examining the indirect effect of parents' distress responses to adolescents' negative emotions on depressive symptoms. We hypothesized that greater parental distress responses would be associated with elevations in adolescents' negative responses to life events that would, in turn, predict increases in depressive symptoms over time.

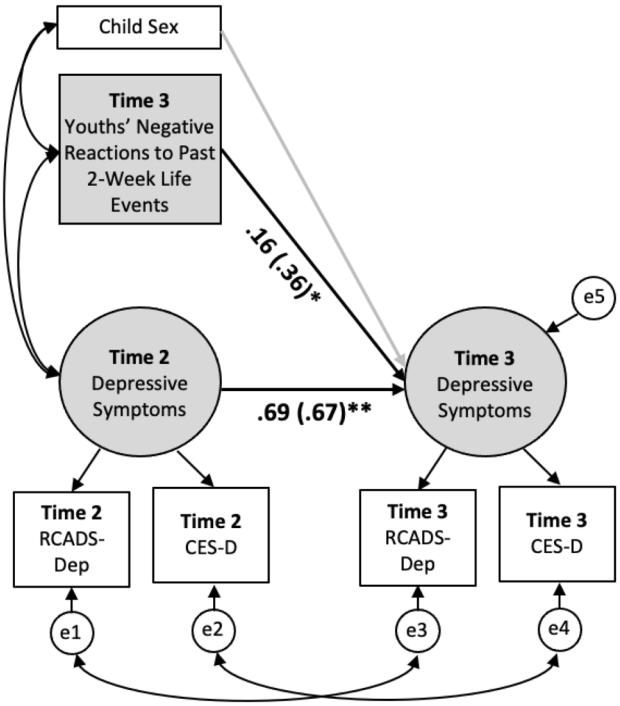

Fig. 1 Main effect model with unstandardized (and standardized) significant path estimates. RCADS-Dep = Youth-Report Depression Subscale of the Revised Children's Anxiety and Depression Scale; CES-D = Youth-Report Center for Epidemiologic Studies Depression Scale. *$p < .05$, ** $p < .01$

Method

Participants and Procedures

Participants were recruited from a subset of adolescents and their parents who took part in a longitudinal study of the development of risky behaviors (see Felton et al., 2019 for study details). As part of the original project, parents and their children ($n = 845$; 44.9% female; 38.8% White, 47.9% Black, 13.2% another race/ethnicity) were recruited from a large metropolitan area in the US across four cohorts to take part in annual data collections starting in 2005, 2008, 2012, and 2013, respectively. Families who were: (1) English speaking, (2) had at least one child between the ages 9 to 13, and (3) willing to take part in annual assessments, were eligible to participate in the study. No other inclusion criteria were used. Data collections were conducted annually through the conclusion of the grant funding period in 2015 (Phase 1) and participants received $40 for completing assessments. Following the receipt of new grant funding, 417 youth who had participated in the original study and were between 14 and 18 years old were re-contacted. Participants were called and emailed in 2017, approximately 1.5 years after the final wave of the original project was completed, and asked to take part in an additional, two-week, longitudinal study examining the effect of stress of adolescent mood (Phase 2). Of those contacted, 90 youth and their parents agreed to participate in additional study procedures. Adolescents received up to $63 for taking part in this portion of the study (depending on the study procedures they completed) and parents received $25. At the start of the second phase of the study, participants (45.6% female) in the sample were, on average, 16.47 years old ($SD = 1.25$), and 38.2% identified as White, 51.7% as Black, 3.4% as Asian and 6.7% as another race/ethnicity. Annual household income ranged from $20,000 to $300,000 ($M = 117{,}703$; $SD = 63{,}658$). Bivariate correlations were conducted examining the relation between participation in Phase 2 and key demographic variables, parental depressive symptoms and parents' distress responses to adolescents' negative affect (see "Measures" below) collected in Phase 1. There were small but statistically significant correlations between parents' ($r = .13$, $p = .046$) and adolescents' (.12, $p = .049$) ages and Phase 2 participation, suggesting that older youth and parents were more likely to enroll in the second phase of the study.

All procedures were approved by the University of Maryland Institutional Review Board for both phases of the project. Prior to taking part in Phases 1 and 2, adolescents and their parents were required to complete informed assent and consent procedures. During Phase 1 (re-labeled Time 1), parents (86.7% mothers) filled out a measure of how they typically respond to adolescents' negative emotions. As part of Phase 2, adolescent participants completed assessments regarding their current depressive symptoms and reactions to negative life events at two time points, each two weeks apart (re-labeled Time 2 and Time 3). Assessments for Time 1 and Time 2 were conducted in a University laboratory, while questionnaires collected at Time 3 were administered online using a web-based survey tool. Participants received monetary compensation at the completion of each phase of the project.

Measures

Parents' Distress Reactions to Adolescents' Negative Emotions

In order to assess parents' distress reactions to adolescents' negative emotions, the Personal Distress subscale of the parent report of Coping with Children's Negative Emotions Scale – Adolescent version (CCNES—A; Fabes et al., 1990) was administered at Time 1. The tool consists of 9 hypothetical situations in which adolescents express a negatively-valanced emotion (e.g. anger, sadness). For each item, parents are provided with 6 possible responses that correspond to the 6 different subscales. An example hypothetical situation includes, "When I see my teenager becoming angry at a close friend, I usually…" while an example of a response indicating personal distress includes, "become uncomfortable and uneasy in dealing with his/her anger."

For each situation, parents are instructed to indicate their likelihood of acting that way for each of the 6 responses on 7-point Likert scale (1 = very unlikely; 4 = medium; 7 = very likely). Only the 9 responses that correspond to the personal distress subscale were used for the purposes of this study. The total score of the subscale was computed by adding parents' scores on each individual item corresponding to subscale. Previous research indicates that the subscales of the CCNES-A have good internal consistency and are reliabile when administered to parents of adolescents (e.g. Daughters et al., 2014; Ehrlich et al., 2014).

Parent Depressive Symptoms

Given that past research has demonstrated links between parental depression and parent socialization of their children's emotions (e.g. Cummings et al., 2013), we controlled for parents' levels of depression at Time 1. We used the Center for Epidemiologic Studies – Depression scale (CES-D; Radloff, 1977) to measure parents' depressive symptoms. The tool contains 20 items; parents were instructed to report the frequency with which they experienced the symptoms associated with depression during the previous week on a 4-point scale (0 = rarely/none of the time; 1 = some of the time; 2 = occasionally or a moderate amount of time; 3 = Most or all of the time). Sample items include, "I had crying spells", and "I could not get going." Total scores were calculated by summing the responses for each item. Higher scores indicated greater levels of depression. The CES-D has been used widely in studies utilizing community samples (e.g. Airagnes et al., 2016, Matta et al., 2019) and has been validated across wide age ranges (Lewinsohn et al., 1997). The tool has sound psychometric properties, good sensitivity and specificity, and high internal consistency (Lewinsohn et al., 1997).

Adolescent Depressive Symptoms

In order to measure adolescent depressive symptoms, we administered the Major Depression subscale from the Revised Children's Anxiety and Depression Scale (RCADS; Chorpita et al., 2000) at Times 2 and 3. The RCADS is a youth self-report measure of anxiety and depression symptoms. The depression subscale consists of 10 items. Youth were asked to rate how often each item applied to them on a 4-point Likert scale (0 = never, 1 = sometimes, 2 = often, 3 = always). Sample items include "I feel sad or empty" and "I have trouble sleeping." The total score was computed by summing the scores for each individual item; higher scores indicated greater levels of depression. The RCADS is a psychometrically sound tool with good factor structure, reliability, and validity in school-based and clinical samples (Chorpita et al., 2000, 2005).

We also administered the Center for Epidemiologic Studies Depression Scale (CESD; Radloff, 1977) at Times 2 and 3, which is a 20-item self-report measure of depression. Youth were instructed to reflect over the past week and indicate the extent to which they experienced each item on a 4-point Likert scale (0 = rarely or none of the time; 1 = some of the time, 2 = occasionally or moderate amount of time, 3 = most or all of the time). Sample items include, "I was bothered by things that usually don't bother me," and "I did not feel like eating, my appetite was poor." Positive items were reverse-scored, and items were summed to obtain total scores; higher scores indicated greater levels of depression. The measure has been used extensively in previous research on adolescents (e.g. Calvete et al., 2019; Slavich et al., 2019).

Adolescents' Negative Reactions to Life Events

Participants completed the Adolescent Perceived Events Scale (APES; Compas et al., 1987) at Time 3 regarding their experiences over the past two weeks (since Time 2). The measure is a 90-item self-report assessment of youth's responses to commonly experienced negative and positive life events (including major events and daily hassles). Youth were first instructed to indicate if they had experienced any of the events during the last six months; for events that they had experienced, they were then asked to rate how they perceived the event to be on a 9-point Likert scale, (-4) = extremely bad, 0 = neutral, 4 = extremely good. Sample items include, "fight with or problems with a friend" and "arrest of a family member." Because we were interested in youth's reactions to negative life events, only items that were perceived as negative in nature were included in the summed score. The absolute value of this sum was then computed, such that higher values represent more negative reactions. At Time 2, youth reported experiencing, on average, 38.2 events ($SD = 15.5$). The tool has been used with high school students in the past and the measure has demonstrated good psychometric characteristics (e.g., Compas et al., 1989; Newcomb & Harlow, 1986).

Demographics

Basic demographic information, including participant sex,[1] age, race/ethnicity, and annual income were self-reported at Time 1.

[1] As adolescent participants and their parents/guardians were specifically asked to report their sex, the term "sex" (which refers to a biological construct) is used throughout the manuscript rather than "gender" (which refers to the social roles associated with sex).

Data Analytic Approach

Preliminary analyses, including bivariate correlations, were examined between all key study variables. Consistent with model building procedures, demographic variables that were significantly correlated with key constructs of interest were then included in subsequent analyses.

To evaluate our first hypothesis, we examined whether youths' negative reactions related to life events predicted changes in depression symptoms over a brief, two-week, period. We created a two-wave structural equation model using M*plus* 6 (Muthén & Muthén, 2010) in which latent depressive symptom factors at Times 2 and 3 were indicated by the same-wave RCADS-depression subscale and CES-D. Cross-wave correlations were allowed between the disturbance terms of the repeated depressive symptom measures at Time 2 and Time 3, as recommended by Cole et al. (2007). Latent depressive symptoms at Time 3 were regressed onto our measure of youths' negative reactions to life events over the past two weeks, controlling for a latent Time 2 depression symptom factor and relevant covariates.

Next, we examined our second hypothesis that youth's negative reactions to life events would mediate the relation between parents' distress reactions and subsequent youth depression symptoms. A three-wave, cross-lag structural equation model was utilized to evaluate mediation. Youth's depressive symptoms at Time 3 were regressed onto youth's negative reactions to life events over the past two weeks (controlling for Time 2 depressive symptoms) which, in turn, was regressed onto parents' distress reactions (see Fig. 1). Indicated covariates were also included as predictors of all endogenous variables. In order to account for the intergenerational transmission of depressive symptoms, parents' depressive symptoms at Time 1 were also added as a predictor of youths' depressive symptoms. The significance of the mediation effect (i.e. parents' distress reactions to youths' negative emotions → youths' negative responses to life events → youths' depression symptoms) was determined by examining a 95% confidence interval (CI) band around the indirect effect using bootstrapping procedures (Preacher & Hayes, 2008). A 95% CI that does not include zero indicates significant statistical mediation.

Four fit indices were used to estimate how well each model fit the data: the χ^2 statistic, the Comparative Fit Index (CFI; Bentler, 1990), Tucker-Lewis Index (TLI; Tucker & Lewis, 1973), and the Root Mean Square Error of Approximation (RMSEA; Steiger, 1990). Consistent with standards in the field, CFI and TLI values above 0.90 were deemed to represent good fit and 0.95 reflect excellent fit (Hu & Bentler, 1999). RMSEA values below 0.05 were considered close fit, while values below 0.10 represent marginal fit (Browne & Cudeck, 1993).

Full information maximum likelihood (FIML) estimation methods were used to handle missing data. FIML provides less biased parameter estimates than procedures such as listwise deletion, pairwise deletion, or single imputation methods under the missing at random assumption (Little & Rubin, 1987). Thus, all analyses were conducted on the full sample of 90 youth.

Results

Missing Data Patterns and Descriptive Statistics

First, patterns of missing data were examined using Little's Missing Completely at Random (MCAR) test. The test was not significant: $\chi^2(20) = 23.67$, $p = .257$, supporting the assumption that data could be considered MCAR. All variables were initially examined for univariate normality and found to be well within expected ranges for skew and kurtosis (≤ 10.0). Bivariate correlations were also examined for all key variables. Of note, we found significant relations between sex and scores on the measures of parents' distress responses to youths' negative emotions and both measures of depressive symptoms, indicating that girls experienced higher levels of parents' distress responses to their negative emotions and depressive symptoms at both timepoints. Thus, sex was retained as a covariate in all models. Youths' negative reactions to life events were also positively associated with depressive symptoms at all timepoints, suggesting that more extreme negative reactions were associated with greater depressive symptomology. Moreover, and as expected, questionnaires measuring the same constructs within and across waves were strongly correlated. Descriptive statistics and correlations are reported in Tables 1 and 2.

Table 1 Means (percentages), standard deviations and reliabilities of key study variables

	Mean	*SD*	alpha
T1 Parent-Report CCNES-Parent Distress	2.11	1.11	.83
T1 Parent-Report CES-D	11.69	9.08	.89
T3 Youth-Report APES-negative reactions	15.05	16.18	.94
T2 Youth-Report RCADS-Depressive Symptoms	30.52	19.41	.85
T3 Youth-Report RCADS-Depressive Symptoms	30.80	21.95	.86
T2 Youth-Report CES-D	14.26	8.72	.67
T3 Youth-Report CES-D	12.26	8.50	.75
Sex (female)	45.6%		
Age	16.37	1.34	

CCNES Coping with Children's Negative Emotions Scale, *CES-D* Center for Epidemiologic Studies Depression Scale, *APES* Adolescent Perceived Event Scale, *RCADS* Revised Children's Anxiety and Depression Scale

Table 2 Summary of bivariate correlations between key study variables

		1	2	3	4	5	6	7	8
1	T1 (PR) CCNES-PD	-							
2	T1 (PR) CES-D	.38**	-						
3	T3 (YR) APES-neg	.24	.23	-					
4	T2 (YR) RCADS-Dep	.13	.24	.42**	-				
5	T3 (YR) RCADS-Dep	.19	.34*	.51**	.70**	-			
6	T2 (YR) CES-D	.07	.24*	.27*	.73**	.63**	-		
7	T3 (YR) CES-D	.15	.35*	.48**	.62**	.71**	.62**	-	
8	Sex	–.23**	–.10	.04	–.21**	–.23	–.22*	–.29*	-
9	Age	–.03	–.17	–.18	–.06	–.16	–.13	–.22	.04

Sex is coded as 0 = female, 1 = male; T1 (PR) CCNES-PD = Time 1 Parent-Report Coping with Children's Negative Emotions Scale – Personal Distress Subscale; T1 (PR) CES-D = Time 1 Parent-Report Center for Epidemiologic Studies Depression Scale; T3 (YR) APES-neg = Time 3 Youth-Report Adolescent Perceived Event Scale-Negative Reactions; T2 (YR) RCADS-Dep = Time 2 Youth-Report Depression Subscale of the Revised Children's Anxiety and Depression Scale; T3 (YR) RCADS-Dep = Time 3 Youth-Report Depression Subscale of the Revised Children's Anxiety and Depression Scale; T2 (YR) CES-D = Time 2 Youth-Report Center for Epidemiologic Studies Depression Scale; T3 (YR) CES-D = Time 3 Youth-Report Center for Epidemiologic Studies Depression Scale

*$p < .05$, **$p < .01$

Main Effect Model

To examine the first hypothesis that adolescents who respond more negatively to life events would experience greater increases in depressive symptoms, we examined a two-wave structural equation model. The model fit the data well: $\chi^2_{(df=5)} = 7.09$, $p = .214$; CFI = 0.99; TLI = 0.96; RMSEA = 0.06 (90% CI = 0.00 – 0.16). Adolescents' negative reactions to life events over the previous two weeks predicted changes in depressive symptoms across that same time period (see Fig. 1), indicating that more negative reactions were associated with steeper increases in depressive symptoms over time in support of hypothesis one.

Mediation Model

In order to test the second hypothesis that parent-reported distress reactions to youths' negative emotions predicted youths' own negative reactions to life events, which, in turn, drives changes in adolescent-reported depression symptoms, we examined a mediation model (described above). The model provided an excellent fit to the data: $\chi^2_{(df=10)} = 12.12$, $p = .277$; CFI = 0.98; TLI = 0.96; RMSEA = 0.05 (90% CI = 0.00 – 0.13). As predicted, parents' distress reactions to youths' negative emotions significantly predicted adolescents' negative reactions to life events, indicating that higher rates of parental distress were predictive of youths' more extreme negative reactions. In turn, youths' negative reactions to life events were significantly associated with changes in depressive symptoms over time, suggesting that greater negative reactions to events experienced over the previous two weeks led to steeper increases in depressive symptoms. Of note, neither parents' depressive symptoms at Time 1 (unstd. est. = –.06, $p = .666$) nor adolescent sex (unstd. est. = –.06, $p = .577$) significantly predicted changes in adolescent depressive symptoms, and the direct effect of parents' distress reactions on youth depressive symptoms was not significant (unstd. est. = –.06, $p = .529$; see Fig. 2).

Finally, we examined the indirect pathway from parent-reported distress reactions to youths' negative emotions to changes in youth-reported depressive symptoms via adolescents' reported negative reactions to life events (controlling for youth sex and parental depressive symptoms). The indirect effect was significant (std. ind. eff. = 0.13, $SE = 0.07$, 95% CI = .003 to .264), indicating that parents' distress reactions to youths' negative emotions influenced increases in youths' depressive symptoms via their effects on youths' own negative responses to stressful events.

Discussion

The current study examined parents' distress reactions and youths' negative responses to life events as key factors underlying the marked increase in risk for depression that emerges during adolescence. Our findings support the prospective link between adolescents' negative reactions to life events over a two-week period and subsequent increases in depressive symptoms over that same time period. We also found support for the risk pathway in which adolescents' negative reactions to life events operated as a mediator of the relation between parental distress reactions and adolescent depression over time. In the current design, we narrowed our conceptual approach by focusing specifically on

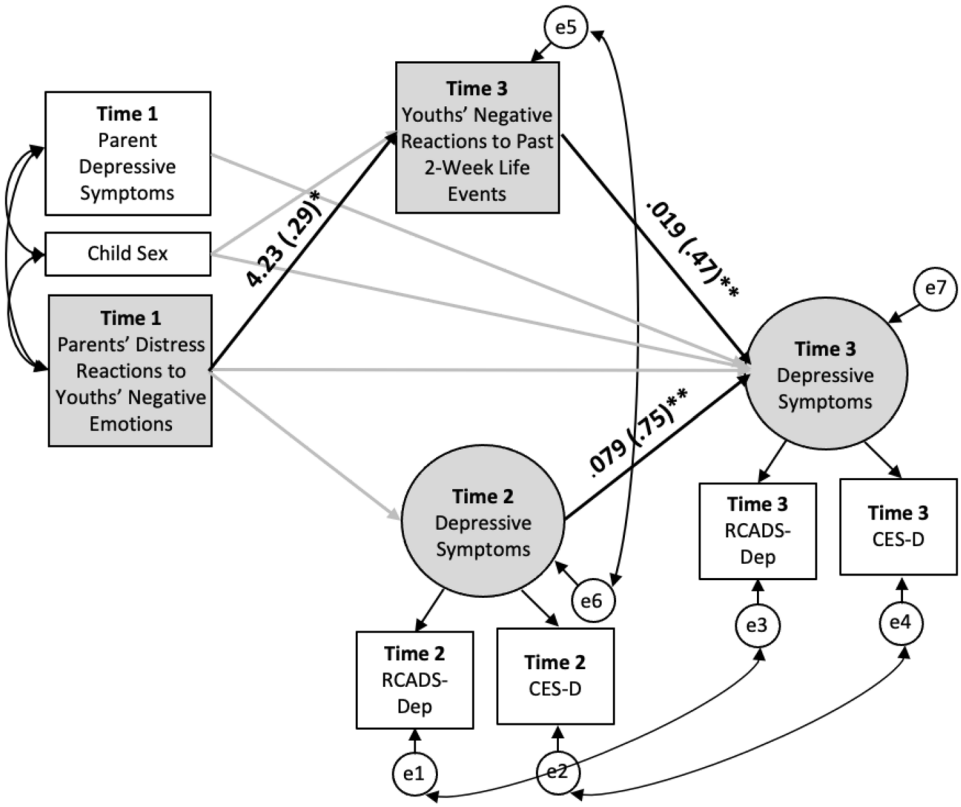

Fig. 2 Mediation model with unstandardized (and standardized) significant path estimates. RCADS-Dep = Youth-Report Depression Subscale of the Revised Children's Anxiety and Depression Scale; CES-D = Youth-Report Center for Epidemiologic Studies Depression Scale. *$p < .05$, ** $p < .01$

parental distress reactions to adolescents' negative emotions as a theoretically-driven and domain-specific parenting predictor of adolescents' negative reactions to life events. This study contributes to the field by identifying one mechanism through which parent emotion socialization impacts depression symptoms among youth. Elucidating risk mechanisms that emerge in the high-stress developmental window of adolescence – when rates of depression show a marked increase – holds promise for identifying impactful targets for prevention and intervention efforts aimed at minimizing risk for depression.

Our findings contribute to the mixed findings documenting the association between parental distress reactions and depression symptoms (Eisenberg et al., 1999; Faro et al., 2019; Suveg et al., 2011). The current study underscores the importance of indirect effects and highlights youths' negative reactions to life events as a key factor explaining this link. Mixed findings in the literature could be related to the specific emotion socialization dimensions considered, and the extent to which specificity of the emotion socialization dimension is appropriately paired with the target outcome. In the current study, we applied a theoretically-driven selection of parental *distress reactions* as the uniquely important element of emotion socialization as it relates to adolescents' own reactions to stressful events and subsequent risk for depression. Our findings are consistent with others showing specificity of the distress reactions element in driving risk for offspring internalizing problems (Faro et al., 2019). Results from the current study indicate that parental distress reactions may serve to model and teach adolescents about how to cope and manage distress, which informs how youth then react to their own experiences of stressful events.

In addition to our examination of a domain-specific mediated risk mechanism predicting depression risk, we fill an important gap in the literature by examining these processes during the high-stress and high-risk window of adolescence. Stressful life events and negative interpretation of such events increases rapidly during the adolescent years, highlighting the importance of youths' ability to regulate, respond adaptively, and manage reactions to stressful events. Youths' negative reactions and maladaptive processing of stressful events translates directly to the cognitive- and affective-based elements of depression risk, including cognitive distortions, negative attributional styles, and negatively-biased interpretations (e.g., Deal & Williams, 1988; Shirk et al., 2013). Our assessment of youths' negative reactions to these events thus increases its ecological validity and applies most directly to the nuance of how youth may cope with real-world stressful events.

Confidence in our findings is further strengthened since we accounted for both parental and child depression symptoms over time. Inclusion of parental depression symptoms serves as a proxy for the genetic contributions to depressive symptomatology. Although we did not find an effect for parental depression in the current study, this could be

explained by our community-based sample with comparatively lower psychopathology risk than a clinical sample. Future work may benefit from examining the link between parental distress reactions and youths' depression risk in clinical populations where parents and/or adolescents meet criteria for a depressive disorder. Indeed, maternal clinical depression has been associated with more non-supportive emotion socialization behaviors (Silk et al., 2011). Future research may also benefit from examining how genetic risk and emotion socialization behaviors interact to predict adolescents' coping with stressful events and ultimately depression risk, consistent with diathesis-stress models of depression (e.g., Monroe & Simons, 1991).

The current study makes a novel contribution to the literature by examining a domain-specific risk mechanism linking parental distress reactions to youth depressive symptoms via youths' negative reactions to stressful events. Our method allowed for a stringent test of mediation with a longitudinal design and control of prior levels of depression symptoms, as well as utilization of latent variables that model the effect of "true" score variations separate from "error" within the model. Additional strengths include our inclusion of parental depressive symptoms in order to disentangle the effects of parental emotion socialization and the heritability of depressive symptoms. Moreover, this is the first study to test the prospective associations between parents' distress reactions, youths' reactions to discrete life events, and depressive symptoms in the adolescent years. Finally, we employed a multi-informant strategy in assessing the primary constructs of interest, limiting concerns regarding monomethod bias.

The results of the current study must be considered in light of several limitations. Our sample size of 90 may be considered relatively small, though it is also consistent with seminal articles related to parent emotion socialization processes using similar methodological approaches (e.g., Eisenberg et al., 1999). Future studies should seek to replicate these findings utilizing larger sample sizes to ensure that these relations are not sample-specific (Maxwell et al., 2015). Additionally, we intentionally selected a specific measure of youths' negative reactions to life events as an affective measure of a facet of emotion regulation. This was chosen as an ecologically-valid indicator of youths' coping and management of daily stressful events. While this is a critical element of emotion regulation particularly during the adolescent years when stress increases overall, this measure of negative reactions to life events does not tap the full breadth of the multifaceted construct of emotion regulation which, as a whole, underlies risk for adolescent psychopathology (e.g., Shadur & Lejuez, 2015). Similarly, although we intentionally focused on distress reactions consistent with theory, the broader elements of parent emotion socialization were not examined in the current study. Additionally, our study included only one parent (either the mother or father) per adolescent, and future research should examine the possible buffering effects of other caregivers' or adults' emotion socialization in protecting against risk for depressive symptoms even when one caregiver shows high distress reactions to youths' negative emotions. Moreover, future studies should consider parent gender-specific differences with regard to the effect of maternal vs. paternal reactions to youths' negative emotions (e.g. Brand & Klimes-Dougan, 2010).

We also note that our findings are most generalizable to community-based youth and may not apply to higher-risk or clinical samples. Nonetheless, understanding risk mechanisms in community-based samples is critical for identifying subthreshold or prodromal symptoms of depression, and thus such mechanisms can be applied in broader prevention efforts even when indicated risk may be low. As discussed above, testing these mechanisms in clinical samples will be an important area for future research.

Extensions of the current study point to several additional promising areas for future research related to parental distress reactions and youth psychopathology. The current study and work from others collectively highlight the unique importance of *distress reactions* as a specific domain of emotion socialization predictive of how youth respond to stress and their risk for depression (Faro et al., 2019). Deeper examination of the distress reactions dimension itself may be warranted. For example, two distinct dimensions of distress reactions uniquely characterized by "internalizing" parental distress reactions versus more "externalizing" parental distress reactions have been identified among mothers in addiction treatment (Shadur & Hussong, 2019). Teasing apart the unique associations between these sub-dimensions of distress reactions and specific youth psychopathology factors may be a fruitful area for future research. Additionally, we focused specifically on a parent-driven prospective model, and future work should examine the transactional processes and child-driven models in which youths' reactions elicit specific parental reactions. Specifically, recent research suggests important bidirectational relations between parent and child emotion regulation (i.e. Chan et al., 2021; Felton et al., 2021). Longer periods of follow-up could examine both transactional relations as well as providing insight into how parent socialization of distress reactions may impact the phenomenology of depressive symptoms in their offspring as they reach adulthood. The current study also utilized a short-term retrospective approach to measuring emotional reactions. Future studies should include prospective reports and observational measures to decrease the risk of reporter biases. Finally, future research should examine the role of biological sex and gender in these relations. Given some research suggesting that the relation between maternal psychopathology and adolescent depressive symptoms is more

pronounced among girls than boys (e.g. Mason et al., 2017; c.f. Schleider et al., 2014), further examination of these processes both within sex (mother-daughter, father-son) and across sex (father-daughter, mother-son) pairs should be examined.

Findings from the current study hold implications for prevention and intervention efforts, pointing to parental distress reactions as a compelling treatment target for minimizing youths' depressive symptomatology risk. Teaching parents to shift their emotion socialization behaviors toward more positive emotion-coaching reactions to youths' distress may bolster youths' development of adaptive responses to negative life events and ultimately decrease risk for interpretation of these events within a depressive cognitive style. Interventions focused on modifying parent emotion socialization behaviors have also shown promise (Havighurst et al., 2009) and may apply to the treatment and prevention of adolescent depression. Our findings further suggest that even in the context of unsupportive parent emotion socialization, fostering adolescents' own emotion regulation, coping, and healthy responding to negative life events could help buffer risk for depression. Cognitive-behavioral approaches may be particularly effective in targeting and shifting youths' cognitive and affective reactions, emotion regulation, attributional styles, and cognitive interpretations of stress and negative events (Brown et al., 2018; Calvete et al., 2019; Shirk et al., 2013; Weersing et al., 2017). The current study indicates that a combined approach jointly targeting parenting behaviors and adolescents' distress (e.g. Chronis-Tuscano et al., 2013) and processing of stressful life events may be potentially impactful in minimizing risk for depression during the critical developmental stage of adolescence.

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Declarations

Ethical Approval All procedures performed in the study were in accordance with the ethical standards of the institution and with the 1964 Helsinki Declaration and its later amendments.

Conflict of Interest Julia W. Felton, Julia M. Shadur, Mazneen Havewala, Jude Cassidy, Carl W. Lejuez and Andrea Chronis-Tuscano declare that they have no conflict of interests.

Informed Consent Informed consent and assent was obtained from allparticipants included in the study.

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