

Transactional models of depression via caregiver-child interactions: Evaluating conflict resolution as a source of resilience in adversity-exposed families

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ABSTRACT

Background: Youth who experienced early life caregiving adversity (ECA) are at increased risk for developing depression, which may in part reflect a heightened vulnerability to the deleterious effects of later-life stressors, including poor caregiver mental health and interpersonal conflict. Transactional models posit bidirectional influences between caregivers and children that operate over development and more proximally across interactions.

Objective: To address gaps in knowledge of bidirectional influences between caregivers and children, and differences therein based on ECA exposure, we evaluated the effects of caregiver and child depressive symptoms on their own and each other's emotion-related behavior during conflict resolution, and the effects of their behavior on their own and each other's changes in affect expression from conflict resolution to a recovery task.

Participants and setting: 161 caregiver-child dyads (child age 6–16 years; 49 % female youth; 45 % caregivers of ECA-exposed youth) participated in videorecorded conflict resolution and subsequent recovery tasks.

Methods: Caregivers reported on their own and their child's depressive symptoms. Trained coders rated caregiver and child positive and negative affect and supportive and unsupportive emotion-related behavior.

Results: Contrary to expectations derived from models of stress-sensitization, results of actor-partner interdependence models demonstrated positive associations between caregiver depressive symptoms and supportive child behavior, among ECA-exposed families. Among these families, only, child supportive behavior was also associated with greater increases in subsequent caregiver positive affect during the recovery task.

Conclusions: In contrast to models of stress-sensitization, youth supportive reactions to caregiver distress may initiate positive spirals that transcend interactions. Implications for intervention efforts are discussed.

1. Introduction

Among adolescents, depression is prevalent, impairing, and recurrent; adolescent clinical depression is often preceded by elevated levels of depressive symptoms earlier in childhood (e.g., Dolcini-Catania et al., 2020) that unleash cascades of impaired functioning across the lifespan (e.g., Bongers et al., 2003; Fergusson & Woodward, 2002). The burden of depressive problems is not equally borne: Children who experienced early life caregiving adversity, including abandonment, death, surrender, or removal from biological caregivers, are at risk for elevated

childhood and adolescent internalizing problems (Maclean, 2003; Juffer & van IJzendoorn, 2005; Heleniak et al., 2024), including depression (for meta-analysis; LeMoult et al., 2020). Early life adversity may increase youth risk for future depression by sensitizing adversity-exposed children to the deleterious effects of later interpersonal stressors (Hammen et al., 2000; McLaughlin et al., 2010). Interactions with depressed caregivers, which are a primary mode of transmitting depression risk (Goodman, 2020), compounded with normative increases in the intensity and frequency of family conflict during the transition to adolescence (Laursen, 2001), may be particularly risky for

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adversity-exposed youth. On the other hand, positive experiences with caregivers may interrupt the transmission of the consequences of early life adversity (Vrshak-Schallhorn et al., 2020) and promote resilience to depression (Hazel et al., 2008). The goal of the present investigation was to address gaps in our understanding of unique dyadic processes among youth who experienced early life caregiving-related adversity and their current caregivers, which may redirect trajectories of depression risk toward resilience.

2. Transmission of depressive symptoms via emotion-related behavior

During childhood and adolescence, parents contribute to the development of children's emotion self-regulation and psychological adjustment through emotion-related parenting behaviors, such as providing comfort and nurturance, and also labeling emotions and coaching children's problem-solving and regulatory strategy use (Eisenberg et al., 1998; Morris et al., 2007). In contrast, unsupportive emotion-related parenting (e.g., punishing or discouraging children's expression of emotions; inhibiting youth autonomy; coercive or controlling behavior) is a potent risk factor for youth depressive symptoms (Allen et al., 1994; Goodman, 2020; Labella et al., 2021; Silk et al., 2011; Yap et al., 2008). Critically, it is well-established that parental depression can compromise parenting behavior (Dix & Meunier, 2009; Goodman, 2020), such that maternal depressive symptoms can lead to less supportive (Campbell et al., 2017; Sellers et al., 2014) and more unsupportive parenting responses (Choi et al., 2023; DeRose et al., 2014; Labella et al., 2023; Lins et al., 2023; Premo & Kiel, 2016; Sellers et al., 2014). However, when mothers with emotion regulation difficulties are able to engage in supportive emotion-related parenting, offspring fare better (Lee et al., 2023).

Though etiological factors in youth depression have historically been assessed from a top-down, parent-driven perspective, children's emotional and behavioral functioning may uniquely contribute to dysregulated parenting (Eisenberg et al., 1998; Patterson, 2002). Children are not merely passive recipients of their environments, but are also active agents in driving family processes (Cummings & Schermerhorn, 2003). Youth and caregiver internalizing problems are bidirectionally linked; these bidirectional associations operate in part through depressed mothers' unsupportive parenting (Kuckertz et al., 2018). Youth elevated negative emotional reactivity and emotion regulation deficits elicit less supportive parenting (Eisenberg et al., 1998; Felton et al., 2021; Kiff et al., 2011) and are exacerbated by aversive interpersonal interactions with parents (Morris et al., 2007), which further entrenches risk for developing depression (Hammen, 2009). Yet, research has historically focused on reciprocal effects between parent and child behavior across development over a long time period (Bell, 1968; Sameroff & MacKenzie, 2003), despite rich theorizing that such processes unfold dynamically moment-to-moment during parent-child interactions (e.g., Hammen, 2009).

3. Zooming in on parent-child transactions: Examining effects of emotion-related behavior across caregiver-child interactions

According to prominent theories of emotion-related parenting, parents' supportive responses to their children's emotions are thought to alleviate children's negative emotional arousal and enhance children's positive emotions (Eisenberg et al., 1998; Morris et al., 2007), which in turn can "undo" the psychological effects of negative experiences (Davis & Suveg, 2014; Fredrickson, 1998, 2002). In contrast, unsupportive (including coercive) parent behavior may exacerbate children's negative emotional arousal (Eisenberg et al., 1998) and prevent opportunities for repair of negative affectivity. Consistent with transactional perspectives, parent behavior during conflict discussions not only shapes their children's behavior in the moment and over time, but children's aversive behavior may beget unsupportive parenting (Patterson, 2002),

with effects that spillover across discussions (Eisenberg et al., 2008).

A dyad's ability to appropriately adjust to new task demands (including their ability to "repair" negative affect elicited during conflict resolution) is a critical component of socioemotional flexibility (Hollenstein et al., 2013), and may shed light on pathways to depression via caregiver-child interaction. Dyadic affective inflexibility across changing interaction contexts is associated with longer-term outcomes, such as treatment-resistant child externalizing problems (Granic et al., 2007) and more maternal internalizing problems and lower mother-daughter relationship quality (Loughhead & Hollenstein, 2016). Rather than being "positive" during disagreements, an indicator of a well-adjusted dyad may be their ability to flexibly shift and restore neutral or positive emotional experiences following a conflict discussion (Granic et al., 2007). Yet, the focus on qualities of dyadic functioning obscures the individual drivers of bidirectional parent-child influences across changing interaction contexts, which is needed to advance understanding of dyadic processes that may perpetuate risk, especially among adversity-exposed youth who are vulnerable to the effects of later-life stress (e.g., parent-child conflict) on depression.

4. Caregiver-child transactions among post-adoptive families of adversity-exposed youth

In the present study, we focus on potentially unique dyadic processes among children who experienced early life caregiving adversity, who are at heightened risk of developing depressive problems (Maclean, 2003; Juffer & van IJzendoorn, 2005; Heleniak et al., 2024) which may be due in part to a greater sensitivity to later-life stress (e.g., Hammen et al., 2010; McLaughlin et al., 2010). Consistent with models of stress-sensitization, childhood adversity may lower youth's threshold for depressogenic reactions to recent stress (e.g., Hammen et al., 2000), particularly potential environmental threats (Soares, 2019) and interpersonal stressors (Rudolph & Flynn, 2007). At the same time, it is imperative to identify processes that promote resilience among adversity-exposed youth, which most likely stem from interactions with their caregivers (Brodzinsky, 1993; van IJzendoorn & Juffer, 2007). Caregivers who adopt or foster non-biological children may have unique strengths, including special educational training in positive parenting strategies (e.g., attunement to children's constructive behaviors and skills in selective ignoring of children's aversive behaviors; Chodura et al., 2021). Supportive caregiving by adoptive parents is prospectively related to reduced youth internalizing problems (Paine et al., 2021; van der Voort et al., 2014), and stable and supportive family relationships are consistently associated with resilience following child maltreatment and foster care system involvement (Afifi & Macmillan, 2011; Chodura et al., 2021). Yet, there is limited work on how adversity-exposed youth and adoptive/foster caregivers respond to each other's behavior, which may offer insight into unique dyadic processes that confer risk or resilience to depression. Leveraging repeated observations of caregiver and child behavior across conflictual and nonconflictual interactions, the current study addressed gaps in our knowledge of transactional processes between child and caregiver depression symptoms and emotion-related behavior, which may influence depression risk via alterations in affective recovery from conflict.

5. Current study

The current study sought to address whether bidirectional influences between children's and caregiver's depressive symptoms, behavior during conflict resolution, and subsequent changes in emotion are altered among families of youth who experienced caregiving adversity. Although adversity-exposed youth may be more sensitive to stress (e.g., effects of caregiver depressive symptoms and unsupportive behavior), caregivers may set in motion cascades toward resilience for adversity-exposed youth, by disrupting child effects on caregiver negativity. Specifically, following models of stress-sensitization, we expected (1)

caregiver depressive symptoms would predict less supportive and more unsupportive behavior during a conflict resolution task and (2) caregiver unsupportive behavior would impede subsequent emotional repair (i.e., decreased positive affect and increased negative affect), especially in adversity-exposed youth. However, drawing on promotive opportunities offered by stable caregivers, we also expected (1) weaker effects of elevated child depressive symptoms on caregiver supportive and unsupportive behavior during a conflict resolution task and (2a) weaker effects of child unsupportive behavior during a conflict resolution on subsequent emotional repair and (2b) stronger effects of child supportive behavior during a conflict resolution on subsequent emotional repair, among caregiving adversity-exposed youth and their caregivers.

6. Methods

6.1. Participants

The sample consists of 161 caregiver-child dyads from 114 families who participated in interaction tasks as part of a broader examination of the effects of early life adversity on physical, cognitive, and emotional development, the *Mind, Brain, and Body* study. Caregivers were eligible to participate in *Mind, Brain, and Body* if they were aged 18 years or older, had at least one child between 6–16 years of age, and could read and write in English. The University of California, Los Angeles IRB approved all study procedures prior to study inception.

Half of children in the sample lived continuously with their biological/birth/first parents and had never experienced maltreatment (Comparison group; $n = 89$; 55 %); the other half of children experienced significant early caregiving adversity in the form of removal/surrender from their biological/birth/first parents' care and/or maltreatment by a caregiver (Early Caregiving Adversity [ECA] group; $N = 72$; 45 %). Within the ECA group, some children were either adopted at birth or placed in foster care before they were adopted later in development ($n = 40$), others experienced placement in foster care before entering a Guardianship care arrangement (which typically results in adoption) ($n = 17$), another was maltreated by a caregiver not resulting in foster care ($n = 1$), and some were exposed to institutional/foster care abroad before being adopted by US families ($n = 14$). Most ECA-exposed children reached stable care (i.e., adoption/guardianship care) in the first 5 years of life (average age = 3.26 years) and the average age of placement did not significantly differ by type of placement. Most (56.7 %) caregivers enrolled one child in the study; the average number of children enrolled was 1.4 (range: 1–5). Sample characteristics are shown in Table 1.

Table 1
Sample Characteristics.

	Comparison ($N = 89$)	ECA- exposed ($N = 72$)
Exposure to a potentially-traumatic event – % Any Exposure	2.3	61.5
Child Age – M(SD)	11.24 (3.65)	11.16 (3.15)
Child Sex – % Male	55.1	47.2
Caregiver Race-Ethnicity – % White, non-Hispanic/Latino/a	24.7	69.4
Household Income – % above \$100,000	46.1	23.6
Study participation prior to COVID-19 pandemic – %	18.0	13.9

Note. Exposure to a potentially traumatic event is based on caregiver report on the Traumatic Events Screening Inventory (TESI).

6.2. Recruitment

Families were recruited through multiple methods, including flyers in community centers, street fairs and community gathering events, referrals from community organization partnerships, and online advertising. Families who expressed interest in participating were contacted for a brief telephone interview to assess eligibility. Exclusion criteria included lack of fluency in the English language; uncorrected vision; and caregiver-report of youth behavioral or psychological concern, learning disability, or youth-reported illicit substance use that would interfere with their ability to comply with study procedures.

6.3. Procedure

After caregivers provided informed consent and children assented to study procedures, children and their caregivers completed an assessment including questionnaires and a videorecorded caregiver-child interaction. The recorded interaction included two 6-minute interaction tasks in a fixed order: a conflict resolution task followed by a recovery task, which offered an opportunity to evaluate how dyads transitioned from a potentially frustrating task to a more positive one. In the conflict resolution task, the dyads were given 1 min to select area(s) of conflict from the Issues Checklist (Prinz et al., 1979) and were then asked to spend 5 min discussing these source(s) of conflict and to generate solutions. In the recovery task, dyads were given 1 min to choose a pleasant activity or activities from the Pleasant Events Checklist (MacPhillamy & Lewinsohn, 1982) and then asked to spend 5 min trying to plan the pleasant event(s). Data were collected from December 2019 to March 2022. Following the onset of the global COVID-19 pandemic, data collection took place remotely over Zoom, while families were in their homes; prior to the pandemic, data collection occurred in the laboratory ($n = 26$; 16.1 %).

7. Measures

7.1. Caregiver and child depressive symptoms

Caregivers reported on their depressive symptoms using the Beck Depression Inventory (BDI). Caregivers responded to 20 items using a 4-point scale from 0 to 3, and higher scores correspond to more severe depressive symptoms. In the present study, one item regarding suicidality was omitted from the original scale for ethical reasons as study staff were not equipped to respond to endorsed suicidality. Internal consistency of the scale (a conservative estimate of scale reliability) was good, Cronbach's $\alpha = 0.90$. Missing responses to at least one item were seen in 32.3 % of participants; two participants completed < 70 % of the BDI and their responses were treated as missing. A mean of responses was obtained, and then standardized for comparison with children's depressive problems.

Caregivers reported on their child's depressive symptoms using the DSM-oriented affective problems subscale of the Child Behavior Checklist (CBCL; Achenbach and Rescorla 2001; Achenbach et al. 2003). Caregivers responded to 10 items using a 3-point scale from 0 to 2, and higher scores correspond to more frequent problems. In the present study, two items regarding suicidality were omitted from the scale for ethical reasons; one item (little interest in activities) was accidentally omitted from the assessment battery. Internal consistency of the scale was good, Cronbach's $\alpha = 0.80$. Missing responses to at least one item were present in 8.7 % of participants; all participants completed > 70 % of the items. A mean of responses was obtained, and then standardized for comparison with children's depressive problems.

7.2. Observed caregiver and child behavior

The Family Interaction Macro-coding system (FIMS; Holmbeck et al., 2007; Richmond et al., 2020) was used to rate caregiver and child

nonverbal and verbal behavior during each of the two interaction tasks. The FIMS is a global coding system, with 31 individual items that are applicable to the child or to their caregiver. For each item, behavior is rated on a 5-point Likert-type scale (1 = *not at all*; 2 = *rarely*; 3 = *sometimes*; 4 = *frequently*; 5 = *very often*).

Coders participated in extensive training prior to coding the video-recorded interactions. Training involved an initial tutorial with an experienced coder, coding interactions (from an independent training dataset), and reviewing these interactions with the trainer. During training, coders independently coded five interactions for reliability assessment and achieved a minimum 90 % agreement rate (i.e., no more than a one-point difference) on practice videos before coding for the present study. Teams of two trained coders double-coded each video-recorded task for caregiver and child behavior. ICCs were checked upon completion of coding of all interactions, reflecting absolute agreement in scores when subjects were rated by multiple coders chosen at random from a larger population of possible coders and the average of their ratings was used (Shrout & Fleiss, 1979). Final item scores were obtained by averaging the two coders' scores.

7.3. Supportive and Unsupportive Emotion-Related Behavior

In the present study, supportive behavior was captured by the "Supportiveness" code, which reflects an individual's use of positive listening skills that demonstrate understanding and acceptance to their partner. Unsupportive behavior was captured by the "Pressures to Agree" code, which reflects the extent of an individual's direct and indirect attempts to pressure their partner to change their position. Interrater reliability was between good to excellent in both tasks, for both caregiver and child (ICC range: 0.67 – 0.88) (Cicchetti & Sparrow, 1981). Notably, whereas ratings on other FIMS behavior codes are influenced by the other dyad member's behavior, the FIMS codes of "Supportiveness" and "Pressures to Agree" were selected because they are rated *independent* of the other dyad member's response, allowing for rigorous assessment of the drivers of bidirectional influences.

7.4. Change in Emotion Expression

Expression of negative emotion was captured by five items: "Intensity of negative affect", "frequency of negative affect," "intensity of dysphoric affect," "frequency of dysphoric affect," and "anger" codes. Interrater reliability was between good and excellent, for both caregiver and child (ICC range: 0.78 – 0.88). Items were averaged to yield a mean score; higher scores indicate more intense and frequent negative affect expression. Reliability for the total score was excellent (Cronbach's alpha for caregiver during recovery task = 0.98; Cronbach's alpha for caregiver during conflict task = 0.96; Cronbach's alpha for children during recovery task = 0.96; Cronbach's alpha for children during conflict task = 0.95). Change in negative emotion expression was operationalized as the standardized residual of the regression of negative emotion during the recovery task on negative emotion during the conflict resolution task.

Expression of positive emotion was captured by two items: "Intensity of positive affect," and "frequency of positive affect" codes. Interrater reliability was good, for both caregiver and child (ICC range: 0.73 – 0.80). Items were averaged to yield a mean score; higher scores indicate more intense and frequent positive affect expression. Reliability for the total score was excellent (Cronbach's alpha for caregiver during recovery task = 0.91; Cronbach's alpha for caregiver during conflict task = 0.92; Cronbach's alpha for children during recovery task = 0.95; Cronbach's alpha for children during conflict task = 0.96). Change in positive emotion expression was operationalized as the standardized residual of the regression of positive emotion during the recovery task on positive emotion during the conflict resolution task.

7.5. Potential covariates

Potential covariates included caregiver-reported characteristics that may influence caregivers' use of specific emotion-related behaviors and/or the antecedents or consequences of these behaviors (Eisenberg et al., 1998): child age, child biological sex (0 = male, 1 = female), and parent race/ethnicity (0 = white, not Hispanic/Latino/a, 1 = racial/ethnic minority). We also evaluated whether primary variables differed depending on whether families participated in the study in the laboratory pre-pandemic or in their homes during the pandemic.

8. Analytic strategy

Our hypotheses regarding the effects of depressive symptoms on supportive or unsupportive behavior and in turn changes in emotional expression were tested using four actor-partner interdependence models (APIMs; Cook & Kenny, 2005), in a structural equation framework. Our expanded APIM (see Fig. 1) simultaneously evaluated (a) the effects of depressive symptoms on behavior during conflict resolution and (b) the effects of behavior during conflict resolution on change in emotional expression from the conflict resolution to the recovery task, while accounting for the nonindependence of data obtained from caregiver-child dyads. The APIM enables rigorous disentanglement of intrapersonal *actor effects* from focal interpersonal *partner effects*, which refer to the extent to which (a) a person's behavior during conflict resolution can be predicted from their partner's depressive symptoms and (b) a person's change in emotional expression can be predicted from their partner's behavior. Following the traditional APIM for distinguishable dyads, there are two sets of actor and partner effects, one for each member of the dyad. By including the covariance between the two exogenous variables, actor effects are estimated while controlling for partner effects, and partner effects are estimated controlling for actor effects. The covariances between the residuals control for additional sources of nonindependence not explained by the model, such as family effects (Cook & Kenny, 2005). Multigroup analyses were conducted to examine the pattern of results separately within the subsample of caregiving adversity-exposed youth and their caregivers and the non-adversity exposed subsample.

Analyses were conducted with MPlus v.8.4 (Muthén and Muthén, 1998–2017). Continuous exogenous variables were grand mean-centered. Analyses were conducted with full information maximum likelihood estimation with cluster-robust standard errors, which adjusts for nonindependence due to clustering of child participants within caregivers and is also acceptable for non-normal data. The following fit indices were used as guidelines for acceptable model fit: comparative fit index (CFI) > 0.95, root mean square error of approximation (RMSEA) ≤ 0.08 and standardized root mean square residual (SRMR) < 0.08 (Hu & Bentler, 1999).

8.1. Statistical power

Sample size was determined by the broader parent study for this project. Post hoc power analyses were conducted using the APIMPower Program (Ackerman & Kenny, 2016). Power analyses suggested that, given moderate actor effects and moderate correlations of actor and partner variables and their errors, the full sample (N = 161 dyads) had 0.95 power to detect small partner effects of size 0.25. Within the subsample of families with adversity-exposed youth (n = 72 dyads), there was 0.66 power to detect small partner effects.

9. Results

9.1. Preliminary analyses

9.1.1. Missing data

There was minimal (<2%) missing data on primary observed

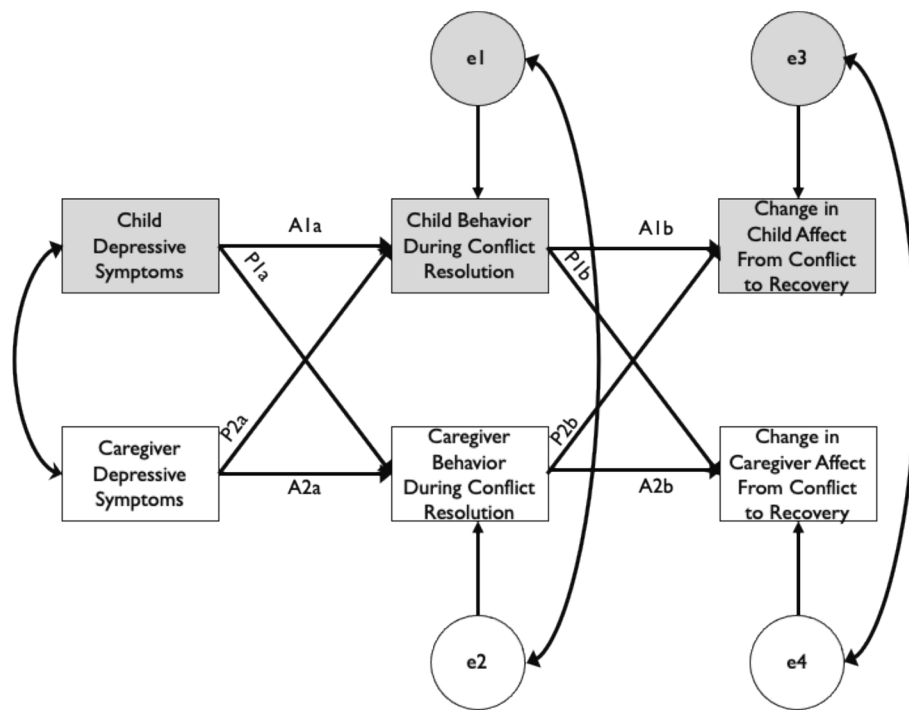


Fig. 1. Conceptual model of bidirectional emotion-related processes across interaction tasks. Note. Paths are labeled with the convention: A = Actor Effect. P = Partner Effect. 1 = Child-driven. 2 = Caregiver-driven. a = Path from depressive symptoms to emotion-related behavior during the conflict resolution task. B = Path from emotion-related behavior during the conflict resolution task to change in emotion expression from the conflict resolution to recovery task. Covariate effects not shown for visual clarity.

variables; 4.3 % of participants were missing on child depressive symptoms and 19.30 % were missing on caregiver depressive symptoms.

9.1.2. Task differences

Results of paired samples *t*-tests (see [Supplementary Table 1](#)) indicated medium to large changes (Cohen's *d* = -0.79–0.50) in child and caregiver affect expression from the conflict resolution to recovery task. As expected, across the full sample, children and caregivers displayed more positive affect and less negative affect in the recovery task than they did in the conflict resolution task (all *p*'s < 0.001).

9.1.3. Covariate selection

Associations between potential covariates and primary variables or covariates with missingness can be found in the [Supplemental Material](#). Only child age remained statistically significant in the primary analyses and was retained in the final models presented here.

9.1.4. Descriptives

[Supplementary Table 2](#) shows differences in primary variables among families with adversity-exposed and comparison youth. Relative to the Comparison group, children from the ECA group had more depressive symptoms, $t(101.43) = -4.25$, $p < 0.001$, a medium-sized difference. At a descriptive level, there were small, non-significant differences between groups, such that relative to Comparison children, ECA-exposed children showed less unsupportive behavior during the conflict discussion and had caregivers who showed greater increases in positive affect from the conflict discussion to the recovery task.

[Supplementary Table 3](#) presents bivariate correlations among primary variables, by group (adversity-exposed versus comparison). All primary variables were normally distributed, except for change in caregiver and child negative affect; as noted above, non-normal data was handled with robust maximum likelihood estimation. Due to the moderate-to-large correlations between emotion-related behaviors and between positive and negative affect (Cohen, 1988) and model complexity (i.e., number of covariances required by the APIM

framework), four separate SEMs were conducted examining the effects of emotion-related behavior (either supportiveness or pressure to agree) on changes in positive or negative affect.

10. Primary analyses

10.1. Effects of caregiver's and children's depressive symptoms on each other's emotion-related behavior during the conflict task and from the conflict to the recovery task

We first conducted a set of base models predicting caregiver and child behavior during the conflict resolution task from caregiver and child depressive symptoms (shown in [Supplementary Table 4](#)). We then conducted our four primary multigroup APIMs predicting caregiver and child behavior during the conflict resolution task from change in affect from conflict resolution to the recovery task and depressive symptoms. Standardized estimates of covariances and regression path coefficients from our primary model results are shown in [Tables 2 and 3](#). Note the pattern of results in our primary models was consistent with the base models. Caregiver-to-child and child-to-caregiver effects are described in the text below.

10.1.1. How do caregiver and child depressive symptoms relate to each other's supportive and unsupportive behavior during the conflict task?

10.1.1.1. Adversity-exposed families. As shown in [Supplementary Table 4](#), among adversity-exposed families, higher caregiver depressive symptoms were associated with more supportive child behavior during the conflict task, $Est = 0.267$, $SE\ Est = 0.124$, $p = 0.032$, which was surprising. Caregiver depressive symptoms were not associated with unsupportive child behavior during the conflict task; child depressive symptoms were not associated with supportive or unsupportive caregiver behavior during the conflict task.

Table 2

APIMs predicting caregiver and child behavior and change in positive affect.

		Supportive Behavior		Unsupportive Behavior	
		Comparison	ECA-exposed	Comparison	ECA-exposed
Covariances					
Caregiver-Child		0.557	0.265	0.555	0.238
Symptoms					
Caregiver-Child		0.494	0.473	0.503	0.599
Behavior					
Caregiver-Child Pos. Affect		0.667	0.614	0.651	0.621
Actor path regression coefficients					
Predictor	Outcome				
Caregiver	Caregiver	-0.121	0.118	0.048	-0.092
Symptoms	Behavior				
Caregiver	Caregiver	0.186	-0.073	0.029	0.154
Behavior	Affect				
Child	Child	-0.055	-0.144	0.174	0.186
Symptoms	Behavior				
Child	Child	0.177	0.149	-0.234	-0.002
Behavior	Affect				
Partner path regression coefficients					
Predictor	Outcome				
Caregiver	Child	-0.034	0.267	-0.199	-0.219
Symptoms	Behavior				
Caregiver	Child	-0.007	-0.071	-0.074	0.165
Behavior	Affect				
Child	Caregiver	0.022	-0.188	-0.154	0.204
Symptoms	Behavior				
Child	Caregiver	0.072	0.311	-0.275	-0.133
Behavior	Affect				
Model Fit					
CFI		1.000		1.000	
RMSEA [90 % CI]		0.000 [0.000, 0.099]		0.000 [0.000, 0.102]	
SRMR		0.044		0.045	

Note. Standardized effects are reported. ECA = Early caregiving adversity. APIM = actor-partner interdependence model. Pos. = Positive. Estimates shown in bold are statistically significant, $p < 0.05$. We evaluated whether significant effects differed between the comparison and ECA families using Wald χ^2 tests. * Indicates statistically significant difference in effects for comparison families relative to families with caregiving adversity-exposed youth, $p < 0.05$.

10.1.1.2. Comparison families. As shown in [Supplementary Table 4](#), in comparison families, neither caregiver nor child depressive symptoms were associated with each other's supportive or unsupportive behavior during the conflict task.

10.2. Effects of Caregiver's and Children's Emotion-related Behavior During the Conflict Task on Change in Each Other's Positive Affect from the Conflict to the Recovery Task

10.2.1. How do caregiver and child supportive and unsupportive behavior during the conflict task relate to changes in each other's positive affect from the conflict to the recovery task?

10.2.1.1. Adversity-exposed families. As shown in [Table 2](#), in adversity-exposed families, caregiver supportive behavior was not associated with changes in children's positive affect from the conflict to the recovery task. However, among adversity-exposed families, greater child supportive behavior was associated with greater increases in caregiver positive affect from the conflict to the recovery task (Est = 0.311, SE Est = 0.135, $p = 0.021$).

In adversity-exposed families, neither caregiver nor child unsupportive behavior were associated with change in each other's positive affect.

Table 3

APIMs predicting caregiver and child behavior and change in negative affect.

		Supportive Behavior		Unsupportive Behavior	
		Comparison	ECA-exposed	Comparison	ECA-exposed
Covariances					
Caregiver-Child		0.557	0.265	0.555	0.238
Symptoms					
Caregiver-Child		0.494	0.473	0.505	0.599
Behavior					
Caregiver-Child Neg. Affect		0.730	0.412	0.721	0.370
Actor path regression coefficients					
Predictor	Outcome				
Caregiver	Caregiver	-0.121	0.118	0.048	-0.092
Symptoms	Behavior				
Caregiver	Caregiver	-0.356*	0.476	-0.083	-0.344
Behavior	Affect				
Child	Child	-0.052	-0.144	0.171	0.186
Symptoms	Behavior				
Child	Child	-0.026	-0.040	0.260	0.071
Behavior	Affect				
Partner path regression coefficients					
Predictor	Outcome				
Caregiver	Child	-0.034	0.267	-0.198	-0.219
Symptoms	Behavior				
Caregiver	Child	-0.172	0.077	-0.013	-0.228
Behavior	Affect				
Child	Caregiver	0.025	-0.188	-0.154	0.204
Symptoms	Behavior				
Child	Caregiver	0.168	-0.205	0.227	-0.024
Behavior	Affect				
Model Fit					
CFI		1.000		1.000	
RMSEA [90 % CI]		0.000 [0.000, 0.067]		0.000 [0.000, 0.072]	
SRMR		0.037		0.044	

Note. Standardized effects are reported. ECA = Early caregiving adversity. APIM = actor-partner interdependence model. Neg. = Negative. Estimates shown in bold are statistically significant, $p < 0.05$. We evaluated whether significant effects differed between the comparison and ECA families using Wald χ^2 tests. * Indicates statistically significant difference in effects for comparison families relative to families with caregiving adversity-exposed youth, $p < 0.05$.

10.2.1.2. Comparison families. As shown in [Table 2](#), in comparison families, neither caregiver nor child supportive behavior during the conflict task were associated with changes in each other's positive affect from the conflict to the recovery task. In comparison families, caregiver unsupportive behavior during the conflict task was not associated with change in child positive affect from the conflict to the recovery task, all p 's > 0.27 . However, greater child unsupportive behavior in the conflict task was marginally associated with decreases in caregiver positive affect from the conflict to the recovery task (Est = -0.275, SE Est = 0.161, $p = 0.088$).

10.3. Effects of Caregiver's and Children's Emotion-related Behavior During the Conflict Task on Change in Each Other's Negative Affect from the Conflict to the Recovery Task

10.3.1. How do caregiver and child supportive and unsupportive behavior during the conflict task relate to changes in each other's negative affect from the conflict to the recovery task?

10.3.1.1. Adversity-exposed families. As shown in [Table 3](#), in adversity-exposed families neither caregiver nor child supportive or unsupportive behavior during the conflict task were associated with changes in each other's negative affect from the conflict to the recovery task.

10.3.1.2. Comparison families. As shown in Table 3, in comparison families, neither caregiver nor child unsupportive behavior during the conflict task was associated with change in child negative affect from the conflict to the recovery task all p 's > 0.27 . Among comparison families, caregiver unsupportive behavior during the conflict task was not associated with change in child negative affect from the conflict to the recovery task; however, greater child unsupportive behavior during the conflict task was marginally associated with increases (or smaller decreases) in caregiver negative affect from the conflict to the recovery task, $Est = 0.227$, $SE\ Est = 0.118$, $p = 0.053$.

11. Discussion

Using observational data collected among a sample of children who had or had not been exposed to early life adversity, the current study examined how early adversity shapes family interactions, focusing on unique dynamics involving the interpersonal influences of depressive symptoms and conflict behaviors on emotional expression. Results provided limited support for our hypotheses, along with some surprising findings that shed light into dynamics operating within adversity-exposed families. Overall, our results demonstrated moderately-sized concurrent associations between caregivers' and their children's observed behavior and affect across the interaction tasks, as well as somewhat surprising small interpersonal effects of child supportive behavior among adversity-exposed families. Contrary to models of stress-sensitization, adversity-exposed youth exhibited more supportive behavior in response to elevated caregiver depressive symptoms, and their caregivers were uniquely susceptible to the salutary effects of child supportive behavior on their emotional repair. Taken together, these results underscore that early life adversity shapes how children respond to the caregiving environment (e.g., caregiver depressive symptoms); rather than reflecting mechanisms of risk, transactions between children and their caregivers may reflect unique potential sources of resilience among adversity-exposed youth in stable care.

11.1. Positive emotional recovery from conflict among adversity-exposed families

Our results provided compelling evidence that, even after accounting for the positive concurrent caregiver-child associations and intrapersonal effects, greater child supportive behavior during a conflict task was associated with greater subsequent increases in caregiver positive affect into the recovery task, only among adversity exposed families. Though all families were presented with an opportunity to "boost" positive affect and repair any ruptures incurred during the conflict discussion when participating in a subsequent recovery task, not all individuals exhibited increased positive affect during the recovery task. Relative to biological/birth/first caregivers, caregivers of adversity-exposed children exhibited marginally greater increases in positive affect after this discussion. Our results also point to the unique susceptibility of caregivers of adversity-exposed youth to "positive spirals" (Fredrickson, 1998, 2002) emanating from conflict resolution discussions. Critically, these data extend theory and literature that focuses on positive spirals that may be set into motion by parents' supportive behavior (e.g., Davis & Suveg, 2014) by suggesting they may also be initiated by children's supportive behavior (e.g., positive listening). Over time, repeated interactions between children and their caregivers shape the family's emotional climate, including caregiver emotional expressivity, and directly and indirectly shape children's developing emotion regulation abilities (Eisenberg et al., 1998; Morris et al., 2007).

11.2. Early life adversity and resilience to negative spirals from unsupportive behavior

The present study focused on a specific form of unsupportive behavior – pressure to agree – which features prominently in

transactional models of child development (Patterson, 2002). Integrated with the literature on adversity-induced stress sensitization (e.g., McLaughlin et al., 2010), we proposed that unsupportive behavior would escalate negativity in ways that "spilled over" to subsequent interactions and prevented opportunities for repair, especially for adversity-exposed youth who are hypervigilant to threat cues in their environment (e.g., Shipman et al., 2005). However, in contrast to previous findings that experiences of early adversity shape children's interpretation of caregiver emotion socialization behavior (Shipman et al., 2005; Shipman & Zeman, 2001), children (regardless of adversity exposure) did not show a change in negative affect in response to prior caregiver unsupportive behavior. Pressuring children to agree and take the parent's point of view, a mild form of coercion seen in the present study, may be positively appraised as caregiver's involvement in children's daily lives or as efforts that scaffold the conversations and promote compromise. Future investigations that include children's and caregiver's appraisals of behavior are needed to understand this surprising finding, as are methods that capture more severe forms of harsh or unsupportive parenting (e.g., psychological aggression, physical discipline).

Consistent with prior work, our results demonstrate negative child-driven effects (e.g., Kiff et al., 2011), such that children's unsupportive behavior positively predicted change in caregiver negative affect (i.e., increases or smaller decreases in negative affect), but only among comparison families. These results are complemented by a small, nonsignificant effect of greater child unsupportive behavior on decreases (or smaller increases) in caregiver positive affect, only among comparison families. In contrast to comparison families, adoptive caregivers may have greater access to dispositional resources (e.g., emotion regulation ability) or professional resources (e.g., parent training) that allow them to notice immediate reactions to children's behavior and engage in compensatory strategies that prevent them from becoming entrenched in negative spirals. An alternative possibility is that the effects may be weaker in adversity-exposed families, as these children exhibited somewhat less unsupportive behavior during the conflict resolution discussion, which may have made it more difficult to detect child-driven effects.

11.3. Depression and emotion-related behavior

As expected, among biological/birth/first comparison families, caregiver's and children's depressive symptoms were positively correlated, and children in these families exhibited substantially fewer depressive symptoms than their adversity-exposed counterparts. However, within adversity-exposed families, children's and caregiver's depressive symptoms were not associated, which may reflect lower shared genetic influences and/or the enduring effect of children's early life adversity exposure prior to placement with their current caregiver. In neither comparison nor adversity-exposed families did children's depressive symptoms predict subsequent caregiving behavior. The null findings of child depressive symptoms on their caregivers' behavior may be due to dyads' hypothetical discussion of conflict, which may have been less likely to elicit children's ineffective conflict strategies than a situation that elicited *in vivo* conflict (Rinaldi & Heath, 2007). Although the present study benefited from observational assessment of behavior, which minimized potential bias due to shared assessment methods, it is also possible that the effects of child depressive symptoms operate through parents' perceptions of caregiver-child interactions rather than through observable differences in behavior.

Yet, contrary to expectations, there was evidence that for adversity-exposed youth, greater caregiver depressive symptoms elicited *more* supportive child behavior. The literature on early life adversity has often adopted a deficit perspective, suggesting children may become sensitized to the deleterious effects of subsequent stress (e.g., McLaughlin et al., 2010). However, in the context of prior adversity, children may have developed unique strengths, including greater empathic concern

and prosocial behavior following adversity (Li et al., 2013). From this perspective, heightened supportive presence during conflict may reflect a positive adaptation to the current caregiving context, which is supported by evidence that child supportive behavior elicited greater increases in caregiver positive affect during the emotional recovery task.

11.4. Strengths and limitations

The present study benefited from several strengths. Notably, the present study benefited from observations of caregiver and youth behavior and affect, across two ecologically-valid interaction contexts. Extant research is limited by its overreliance on questionnaire-based measures of dispositional parenting; however, weak correspondence between parent- and youth-reports of parent behavior suggests these reports may be influenced by other factors, including reporter biases (Schwartz et al., 2012). Our use of APIM allowed us to elucidate bidirectional effects of depressive symptoms and specific behaviors that exist independent of other shared influences (e.g., task demands, genetic influences) that may account for similarity between dyad members. Further, the APIM approach afforded rigorous disentanglement of caregiver- versus child-driven effects, independent of concurrent covariation and intrapersonal effects, highlighting the often-overlooked role children play in shaping caregiver-child interactions. Finally, the present study also contributed to the limited work on emotion-related parenting among adoptive/guardian families of adversity-exposed youth. In contrast to work that has evaluated maladaptive emotion processes in youth in foster care (e.g., Shipman et al., 2007), our results highlight a unique potential source of resilience among families of children in stable placement following early adversity exposure.

At the same time, our results must also be considered in light of the study's limitations. Whereas affect was assessed with multiple indicators, behavior was assessed with two specific behavior codes (supportiveness and pressures to agree) that were carefully selected to align with influential transactional theories of emotion socialization and coercive dynamics (Eisenberg et al., 1998; Patterson, 2002) and were coded independent of partner's behavior. In contrast, prior work that has adopted a more severe view of unsupportive parenting (e.g., psychological aggression or spanking) has demonstrated bidirectional effects with youth behavior problems (Kuckertz et al., 2008; MacKenzie et al., 2014). It is also plausible that the behaviors under study may bear different consequences in other cultural groups depending on caregiver and child racial and ethnic identity (Raval & Walker, 2019), which the present study was not powered to detect. As the families in the present study were recruited from the community and exhibited relatively little unsupportive behavior and negative affect, our results may not generalize to treatment-seeking families who may exhibit more negativity and more severe depressive symptoms.

Our study was composed of distinct subgroups of ECA and Comparison families for whom we evaluated these processes; however, our study was underpowered to detect potential differences between these groups, or potential differences due to child gender or age. Girls may have a lower threshold of reactivity to interpersonal stress following adversity exposure, which may be catalyzed by the suite of biological and social changes instantiated by pubertal onset (McLaughlin et al., 2010). Bidirectional effects between children and their caregivers may also experience a period of recalibration during adolescence, which typically brings with it temporary increases in conflict and decreases in relational closeness (Branje, 2018). Interestingly, past research has shown that youth shift from a state of neurobiological and socioemotional dependence on their parents to a state of greater independent regulation and self-reliance in adolescence, such that there may be reduced parent-driven influence in adolescence (Hostinar et al., 2015; Gee et al., 2014). Replication and extension of our results in larger samples is needed to evaluate between-group differences in transactional effects between children and caregivers.

12. Conclusion

The present study suggests potential sources of resilience among families of adversity-exposed youth: Adversity-exposed youth adapt to caregiver's depressive symptoms by showing more supportive behavior during conflict resolution, which supports their caregiver's emotional repair; their caregivers are also less sensitive to their children's unsupportive behavior during conflict. Our results bear important implications for refining and innovating prevention and intervention programs, and warrant replication and extension in further research, including investigation of both short- and long-term effects of bidirectional caregiver-child interaction effects with respect to depressive symptoms. Prevention and intervention programs may benefit from capitalizing on children's abilities to adapt to their caregiving environment.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.childyouth.2024.107945>.

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