



Parent-child attachment and trauma-related dissociation among youth in out-of-home care: The age-dependent roles of caregiver-child attachment and placement duration

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ABSTRACT

Background: Child maltreatment and disruptions in attachment relationships have been linked to higher levels of dissociation.

Objective: This study explored the influences of birth parent-child attachment, caregiver-child attachment, and placement duration on dissociative symptoms among youth living in out-of-home care.

Participants and Setting: Youth with histories of maltreatment who were recently placed in out-of-home care ($N = 310$; $M_{age} = 10.25$; 48.9 % female).

Methods: A moderated mediation analysis was employed to examine the effects of birth parent-child attachment on dissociation, and to examine age-conditional indirect effects through caregiver-child attachment and placement duration.

Results: Birth parent-child attachment directly influenced dissociative symptoms ($B = -3.88$, $p = 0.004$) and was partially mediated by caregiver-child attachment and placement duration. The indirect effects through caregiver-child attachment were negative and significant at *younger* ages (at age 9.36, $B = -1.34$, 95 % CI $[-3.41, -0.22]$; at age 10.25, $B = -0.51$, 95 % CI $[-1.24, -0.07]$), and nonsignificant by age 11.14. The indirect effects through placement duration with their caregivers were negative and significant among the *older* youth (became significant at 10.25, $B = -0.69$, 95 % CI $[-1.66, -0.08]$, and was strongest by age 11.14, $B = -1.90$, 95 % CI $[-4.12, -0.45]$).

Conclusion: Relational pathways linking parent-child attachment to dissociation are context-dependent. Findings emphasize the need for interventions and programs that help youth navigate relationships with their birth parents and caregivers, encourage emotional and relational safety along with placement stability, and are developmentally sensitive, adapting to changing needs over time.

High levels of dissociation are linked to increased risks of suicidality and self-harm (Sommer et al., 2021; Stein et al., 2013), more severe symptoms of posttraumatic stress disorder (PTSD) (van Huijstee & Vermetten, 2018), and worse mental and physical health

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outcomes (Boyer et al., 2022). Therefore, it is essential to identify modifiable factors that can be targeted for prevention, especially among youth in out-of-home care (OOHC) who enter the system after substantiated reports of abuse and neglect. Experiencing child maltreatment within interpersonal relationships increases the likelihood of heightened dissociative symptoms (Schimmenti and Caretti, 2016). Disruptions in parent-child attachment are associated with more frequent and severe dissociative symptoms, while healthy relationships can buffer the impacts of trauma (DePrince et al., 2007; Freyd, 1996; Kong et al., 2018; Paetzold et al., 2017). For youth in care who have faced difficulties in parent-child attachment relationships, understanding how their attachment to other caregivers influences dissociation symptoms is also crucial. However, less is known about how kinship care providers, non-relative foster parents, and guardians (hereafter referred to as caregivers), and placement stability affect the relationship between parent-child attachment bonds and dissociative symptoms among youth in care. This study explores how birth parent-child attachment affects dissociative symptoms directly and through (a) youths' attachment bonds with their current caregivers and (b) the length of time in their care. To better understand these relationships from a developmental perspective, we examine the moderating effects of youths' age.

1. Dissociation and trauma

Dissociation is a defensive mechanism that serves to protect individuals during and after experiencing severe, inescapable, chronic traumatic events. It involves overmodulation of emotion, resulting in a sense of detachment from oneself, others, and/or the surrounding environment (Lanius et al., 2012). To better capture the variation in symptom expression of PTSD, the dissociative subtype (PTSD-DS) was added to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) in 2013, which requires meeting criteria for both PTSD and dissociation. PTSD-DS criteria include the persistent and recurrent experience of *depersonalization*—disconnection from the body, feelings, thoughts, and/or sensations—and/or *derealization*—related to external awareness and characterized by a feeling of being in a dreamlike state, which involves a sense of detachment from reality and the surrounding environment, including disconnection from others (American Psychiatric Association, 2022).

1.1. Prevalence of potentially traumatic events, PTSD, and PTSD-DS

Experiencing potentially traumatic events (PTEs) is quite common; a nationally representative study in the United States found that 68.6 % of adult respondents reported experiencing at least one PTE during their lifetime (Goldstein et al., 2016). For youth involved with child welfare systems, PTEs have been reported at much higher rates, with 80.3 % reporting experiencing at least one PTE, and 61.7 % reporting two or more (Salazar et al., 2013). Adverse childhood experiences (ACEs), a subset of PTEs occurring before the age of 18, include aspects of child maltreatment and environmental risk factors that are prevalent among child welfare-involved families. In a large sample of children with child welfare experience, 78 % reported experiencing at least six ACEs (Liming et al., 2021). Federal reporting shows that among substantiated maltreatment cases, 74.9 % involved neglect, 17.5 % involved physical abuse, 9.3 % involved sexual abuse, 6.1 % involved psychological maltreatment, 2.3 % involved medical neglect, and 6.8 % involved some other form of maltreatment (Children's Bureau, 2019), exposure that increases the odds of a PTSD diagnosis. Among a sample of youth with foster care experience, 30 % met the lifetime diagnostic criteria for PTSD, compared to 7.6 % in a demographically similar sample from the general population (Pecora et al., 2009).

PTSD-DS may be underreported due to diagnostic complexity, commonly co-occurring with mental health, substance use, and personality disorders (Swart et al., 2020). Among adults with PTSD in a large global survey, 14.4 % reported symptoms of PTSD-DS (Stein et al., 2013). In outpatient settings, rates of PTSD-DS among the total sample have ranged from around 12 % to 30 % (Kim et al., 2019), with higher rates in inpatient settings (Hill et al., 2020) and among child welfare-involved youth (Choi et al., 2019). Among treatment-seeking child welfare-involved youth aged 12 to 16, 23.8 % met diagnostic criteria for PTSD, 23.3 % of the total sample reported dissociative symptoms, and 53.7 % of those who met the criteria for PTSD reported symptoms of derealization and depersonalization (Choi et al., 2019).

1.2. Childhood maltreatment and other risk factors

Certain types of PTEs increase the risk of PTSD-DS, including sexual abuse (Hagan et al., 2018; Lassri et al., 2022), childhood physical abuse and neglect (Boyd et al., 2018; Stein et al., 2013), combat and first-responder related trauma (Boyd et al., 2018), and peritraumatic dissociation—dissociation that occurs during or shortly after the traumatic event (Bennett et al., 2015; Modrowski & Kerig, 2017). Chronic, prolonged, and severe traumatic events are associated with PTSD-DS (Kisiel et al., 2020), especially among those who experience both physical and sexual abuse, who experience chronic abuse by their parent, and whose symptoms present early in life (Vonderlin et al., 2018).

The developmental stage during which a PTE occurs also affects PTSD-DS symptom presentation and severity (Hagan et al., 2018; Olff et al., 2007). The younger a child is when a trauma occurs, the more likely a dissociative response will be employed over hyperarousal adaptation—or increased fear-based responses, such as hypervigilance (Olff et al., 2007). Differences in symptom presentation by age have also been documented (Choi et al., 2019; Kisiel et al., 2020). For example, among two samples of child welfare-involved youth ($N_1 = 27,737$; $N_2 = 5758$; ages 3 to 18), dissociation was highest among youth under age 14 and among those with cumulative and severe trauma (Kisiel et al., 2020). There are also differences in how PTSD-DS presents among adolescents, and more research is needed to understand symptom presentation from a developmental perspective (Choi et al., 2019).

1.3. Attachment, betrayal, and dissociation

When a parent is the source of maltreatment, disruptions in attachment may occur, resulting in dissociation and difficulty in other important relationships throughout the lifespan (Bailey & Brand, 2017). Betrayal Trauma Theory suggests that betrayal by a person or institution relied upon for meeting basic needs creates significant internal conflict (DePrince et al., 2007; Freyd, 1996). When faced with unpredictable or unsafe parent behavior, dissociation may serve as a protective mechanism, allowing a child to maintain a relationship with their parent, who is necessary for survival. Such an adaptation may come at the cost of a sense of self, and experiences of detachment from mind and body can disrupt biopsychosocial development (Schimmenti and Caretti, 2016).

Children learn emotion regulation and coping strategies within the context of their primary attachment relationships (Bowlby, 1973). Even in the absence of abusive or neglectful experiences, parents who have experienced PTEs, disorganized attachment, emotion regulation problems, or difficulty in effective coping strategies may demonstrate behavior that leads to similar insecure attachment patterns and dissociative symptoms among their children (Byun et al., 2016). In addition to missed opportunities to view adaptive coping from their parents, children may struggle to make sense of their own traumatic experiences in the absence of a trusted adult who can be present with them and their experiences.

1.4. Protective capacity of building secure relationships

The pathways to healing are also relational (Birrell & Freyd, 2006; Gómez et al., 2015). It is crucial for youth who have experienced maltreatment to have opportunities to form healthy and supportive relationships to prevent and mitigate adverse outcomes. Having at least one caring adult in a youth's life whom they perceive as safe and protective may moderate the impact that ACEs have on mental and physical health outcomes (Crouch et al., 2019). Mentoring interventions for youth with foster care experience, such as Fostering Healthy Futures (FHF), have demonstrated a reduction in dissociative symptoms (Taussig et al., 2019). In a study examining the impact of the quality of youths' relationships on FHF mentoring program efficacy, birth parent-child attachment and current caregiver-child attachment were positively correlated, and attachment to both the caregivers and birth parents was significantly negatively correlated with PTSD and dissociative symptoms. However, the program showed less impact on trauma symptoms for youth who experienced more lifetime caregiver transitions, and the impacts on quality of life were greatest for youth expressing more negative relationships with their birth parents and fewer caregiver transitions (Weiler et al., 2022).

Caregivers of youth in OOHC play a significant role in key aspects of their well-being, and establishing secure relationships between youth and their caregivers has been shown to improve youths' well-being (Rayburn et al., 2018; Storer et al., 2014). While children's relationships with their birth parents continue to be important, the quality of relationships with their current caregivers may be especially protective. For example, a Dutch study of foster youth attachments to their birth parents and current caregivers found that while youth identified positive feelings toward both birth and foster parents, aspects of well-being were most closely tied to their relationships with their caregivers (Maaskant et al., 2015). The quality of relationships between birth parents and caregivers, as well as their ability to establish trusting relationships, can help alleviate the tension felt by children and youth in care, contributing to improved outcomes (Nesmith et al., 2017).

Establishing trusting relationships remains a core component of facilitating a healing environment for youth who have experienced trauma (Perry, 2009), and quality caregiver-child relationships among youth in care have been shown to buffer the impacts of violence exposure in the home of origin on symptoms of PTSD (Rayburn et al., 2018). Similarly, establishing warm and trusting relationships with other caregivers appears to moderate the relationship between trauma and internalizing symptoms among youth with foster care experience (Wojciak et al., 2017). The level of stability a child experiences in their home environment, as well as healthy parental functioning, has also been shown to be protective (Carlson et al., 2016). However, research related to the influence of youth attachment to their birth parents and caregivers on trauma-related dissociation remains limited, a gap the current study aims to fill.

1.5. Current study

Using secondary data from baseline interviews in the Fostering Healthy Futures study (FHF; Taussig et al., 2007), the current study explores how youth's self-reported attachment to their birth parents influences symptoms of dissociation through (a) their attachment to their current caregivers and (b) the placement duration with their caregivers. The following research questions and hypotheses guided the study: **RQ1.** Is the youth's self-reported attachment to their birth parents associated with symptoms of dissociation after controlling for ACEs? **H1.** Based on previous literature, it is hypothesized that there will be a significant, negative relationship between youths' self-reported attachment bonds with their birth parents and symptoms of dissociation. **RQ2.** Is the youth's self-reported attachment with their birth parents and the severity of dissociation symptomology mediated by (a) caregiver-child attachment bonds and/or (b) the placement duration? Are these relationships further conditional on the youth's age? **H2.** We hypothesize that the relationship between birth parent-child attachment and dissociative symptoms is mediated by both (a) caregiver-child attachment and (b) the placement duration. Specifically, we expect that stronger attachment to birth parents will be associated with stronger caregiver attachment, which in turn will be associated with lower dissociative symptoms. In addition, we expect that youth who have been living with their current caregivers for a longer duration will report weaker relationships with their birth parents, which will also be associated with lower levels of dissociative symptoms. We hypothesize that the strength of these indirect effects will be stronger for younger youth who may be more developmentally sensitive to disruptions in caregiving and rely more heavily on current attachment relationships for emotional regulation.

2. Method

2.1. Data collection

We used data collected at baseline of an evaluation study of the FHF program. Participants and their caregivers were recruited between 2007 and 2011. Although the data were collected over a decade ago, the variables used in this study would not be expected to be affected by the intervening years, as the association between symptoms of dissociation and youths' relationship quality remains relevant today. Because it is often challenging to access and recruit youth currently living in OOHC, there is a need to balance the vulnerability of youth with opportunities for voice and empowerment that research participation can provide (Garcia-Quiroga & Agoglia, 2020). However, this historical context should be considered when interpreting the results of this study.

Participants were recruited through the collaboration of FHF staff and participating county human service departments (Taussig et al., 2007). Study eligibility for the cohort of youth in the current study included placement in any type of OOHC at the time of the interview, having resided with their current caregivers for at least three weeks, and not having a known severe intellectual disability. While some had experienced prior OOHC placements, all youth participants had to have been placed in a new episode of OOHC following a Dependency and Neglect Petition in the 12 months before recruitment. Ninety percent of eligible children/families agreed to participate, resulting in a sample of 310 children in the final analysis.

2.2. Participants

The youth ranged in age from 8.75 to 11.83 years old ($M = 10.25$ years, $SD = 0.89$). Nearly half identified as female ($n = 155$, 48.9 %). Youth self-reported non-exclusive racial and ethnic categories, with 41.6 % of youth identifying as Alaskan Native or American Indian, 2.6 % as Asian, 25.5 % as Black, 1.3 % as Native Hawaiian or Pacific Islander, 52.4 % as Hispanic, 51.5 % as White, and 10.6 % reported Other Ethnicity. Over half (55.5 %) of youth were living in a non-relative foster home at the time of the baseline survey, 41.3 % in kinship care, and 3.2 % in residential treatment or group home settings. The total number of youth-reported caregiver transitions since birth ranged from 2 to 11 ($M = 3.44$, $SD = 1.7$). These transitions in caregivers included any reported change in caregivers, including moving back home with birth parents, or living with a caregiver who was not part of an official OOHC placement.

2.3. Procedures

The original study was approved through a university institutional review board (IRB) in the Western U.S. Details of study participation were explained to participants, and the youth and their guardians signed consent/assent forms. Small incentives (\$40) were offered to participating youth and their caregivers. For the current study, a university IRB in the Northwestern U.S. provided an exemption to conduct secondary data analysis of de-identified data.

2.4. Measures

2.4.1. Independent variable

2.4.1.1. Birth parent attachment. The Inventory of Parent and Peer Attachment – Short Form (IPPA-SF; Gifford-Smith, 2000) was used to measure youths' self-reported attachment and relationship quality with their birth parents. The IPPA-SF demonstrated good reliability in the current sample ($\alpha = 0.92$). The 15-item scales used were the same for both birth parents and caregivers, except for a change in language from "birth parents" to "caregivers" (e.g., *My [birth parents] listen to me*; *My [birth parents] are proud of me*). Answer choices ranged from 1 (*Not at all True*) to 3 (*Often True*), with higher scores indicating greater attachment to their birth parents. The mean score for the current sample was 2.52 ($SD = 0.45$).

2.4.2. Dependent variable

2.4.2.1. Dissociation. The Trauma Symptom Checklist for Children (TSCC; Briere, 1996) was used to measure symptoms of dissociation. For this study, only the Dissociation subscale was used, and it showed adequate reliability in the current sample ($\alpha = 0.80$). It was designed to measure symptoms of disconnection, derealization, and depersonalization (i.e., *Feeling like things aren't real*; *Feeling like I'm not in my body*). Youth were provided a list of feelings, thoughts, and behaviors and asked to rate how often they experienced each using a 4-point scale, ranging from 0 (*never*) to 3 (*almost all of the time*). Standardized t-scores for the subscale were used in the analysis, with possible scores ranging from 0 to 100. Higher scores indicate greater dissociation. The average t-score for the current sample was 51.02 ($SD = 11.23$).

2.4.3. Additional variables

2.4.3.1. Caregiver attachment. The IPPA-Short Form (Gifford-Smith, 2000) was also adapted to measure the youth's self-reported attachment to their current caregiver. It demonstrated adequate reliability in the current sample ($\alpha = 0.83$). Youth were asked to rank their feelings about statements about their caregiver (e.g., *Often True I get upset easily with my [caregivers]*, *I share thoughts and*

feelings with my [caregiver]) on a scale ranging from 1 (*Not at all True*) to 3, (*Often True*). The mean score for the current sample was 2.55 ($SD = 0.32$).

2.4.3.2. Placement duration. The number of months the youth had lived with their current caregivers was obtained from caregiver reports and used as a mediator in the models. The youth had spent an average of 6.35 months ($SD = 3.71$) with their caregivers.

2.4.3.3. Age. The youth's age (in years) was included as a covariate in Model 1 and as a moderator in Model 2 ($M = 10.25$ years, $SD = 0.89$).

2.4.3.4. Adverse childhood experiences (ACEs). ACEs were included as a control variable for both models. ACEs were measured using a 6-item cumulative risk index that includes experiencing *physical abuse*, *sexual abuse*, *removal from a single-parent household*, *violence exposure*, *the number of lifetime caregiver transitions*, and *school transitions* (Raviv et al., 2010). For each of these six areas, a code of 0 or 1 was assigned, with 1 indicating the presence of the risk factor; scores were then summed to produce the overall index. On average, youth had experienced 1.73 ($SD = 1.14$) ACEs in their lifetime.

2.4.3.5. Length of time in current episode of OOHC. The total number of months the youth had spent in the *current* episode of OOHC was obtained from child welfare records. The youth had spent an average of 7.43 months ($SD = 3.43$) in the current OOHC episode.

2.4.3.6. Demographic variables. Sex (female/male), race/ethnicity (see participants section), and the type of OOHC placement (foster care, kinship care, group home/treatment facility) were obtained from youth report and/or child welfare record.

2.5. Analysis

We conducted preliminary data analyses, including descriptive statistics, bivariate correlations, and a multiple regression model to ensure some level of relationship between dependent and independent variables and that the necessary conditions and assumptions were met. A p -value of less than 0.05 was considered statistically significant. We then tested a parallel mediation model using the PROCESS macro (V4.3; Hayes, 2022) for SPSS version 28.0. We used Model 4 to test the direct and indirect effects of birth parent-child attachment on dissociation through caregiver-child attachment and placement duration. Then, Model 59 was used to examine whether

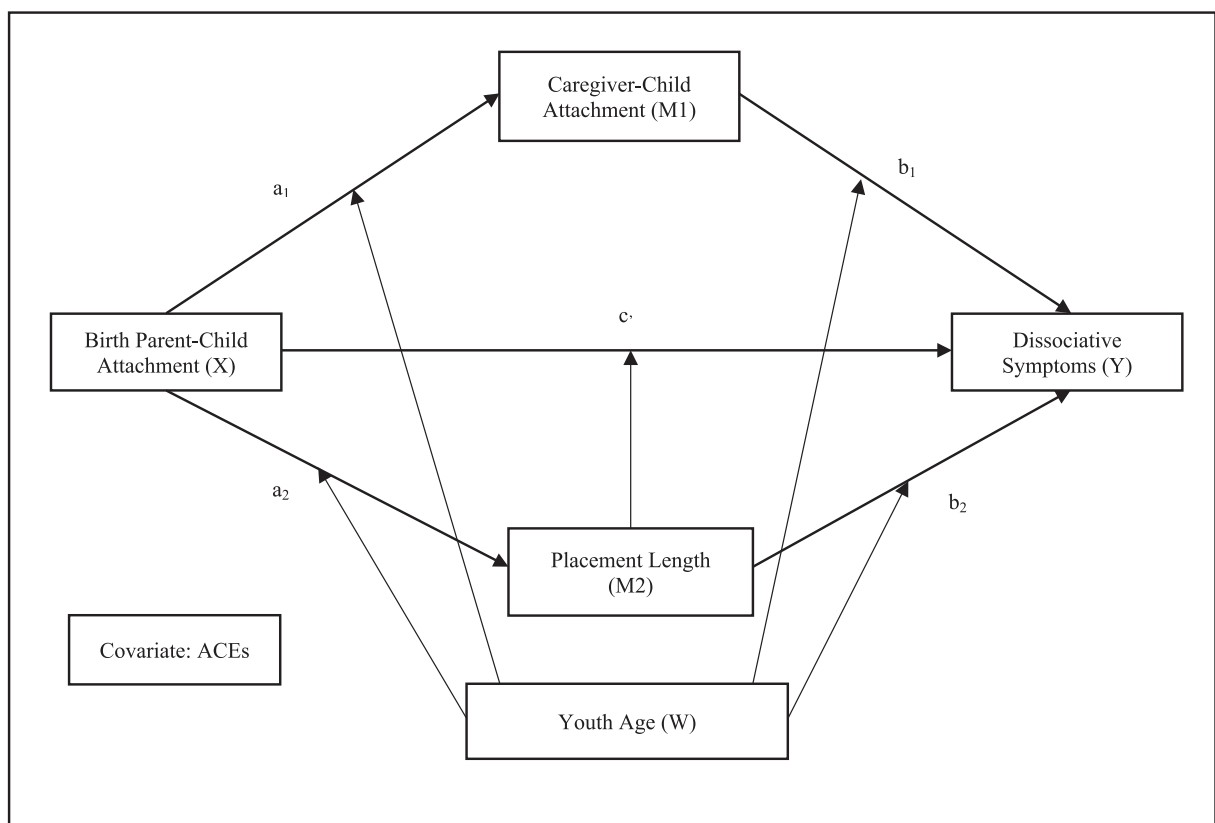


Fig. 1. Moderated parallel mediation model conceptual diagram, conditional direct and indirect effects.

these direct and indirect effects were further conditional on youths' age. ACEs were included as a covariate, and all continuous predictors were mean-centered before analysis. We used bootstrapping procedures to test the indirect effects. Significant indirect effects were indicated when a bootstrapped 95 % confidence interval did not include zero. A power analysis using G*Power version 3.1.9.3 revealed that a total sample size of 103 was required to support the number of selected independent variables and covariates within the models, with an anticipated effect size of 0.15 and a power of 0.80. See the conceptual diagram of the model in Fig. 1 below.

3. Results

Descriptive statistics and independent-samples *t*-tests were calculated for the demographic and study variables. Dissociative symptoms were not significantly associated with sex ($t = 0.04$, $p = 0.97$, $d = 0.004$) or race/ethnicity ($t = 0.65$, $p = 0.51$, $d = 0.08$). Caregiver-child attachment was not significantly associated with sex ($t = 0.74$, $p = 0.46$, $d = 0.08$) or race/ethnicity ($t = -1.59$, $p = 0.11$, $d = -0.20$). Parent-child attachment was not significantly associated with sex ($t = 0.20$, $p = 0.85$, $d = 0.02$) or race/ethnicity ($t = 0.41$, $p = 0.69$, $d = 0.05$). The length of time living with current caregivers was not significantly associated with sex ($t = 0.73$, $p = 0.47$, $d = 0.08$) or with race/ethnicity ($t = -0.49$, $p = 0.62$, $d = -0.06$). Analysis of Variance and Bonferroni pairwise comparisons were used to assess differences in the main outcome variables by placement type (foster care, kinship care, or a group setting). There were no statistically significant differences between placement type groups in their symptoms of dissociation, $F(2, 314) = 1.33$, $p = 0.26$, $\eta^2 = 0.001$, attachment to birth parents, $F(2, 307) = 1.44$, $p = 0.24$, $\eta^2 = 0.001$, attachment to caregivers, $F(2, 314) = 1.79$, $p = 0.17$, $\eta^2 = 0.01$, or placement duration, $F(2, 314) = 2.25$, $p = 0.11$, $\eta^2 = 0.01$. Given this, sex, race/ethnicity, and placement type were not included as covariates.

Bivariate correlations were calculated for all study variables. There was a statistically significant, small, positive correlation between placement duration and dissociation; between ACEs and dissociation; between the number of months in the current episode of OOHC and dissociation; between birth parent-child attachment and caregiver-child attachment; and between ACEs and age. There was a statistically significant, small, negative correlation between age and dissociative symptoms; between placement duration and birth parent-child attachment; and between the months in the current episode of OOHC and birth parent-child attachment. There was a statistically significant, moderate relationship between placement duration and the months in the current episode of OOHC. See Table 1 for descriptive statistics of study variables, bivariate correlations, and multiple regression analysis results.

A preliminary regression model included dissociation as the dependent variable and birth parent-child attachment, caregiver-child attachment, placement duration, youths' age, ACEs, and months in this episode of OOHC as predictor variables. The overall model was statistically significant, $F(6, 303) = 8.70$, $p < 0.001$, accounting for 13 % of the variance ($f^2 = 0.17$) in dissociative symptoms. Stronger birth parent-child attachment was statistically significantly associated with fewer symptoms of dissociation, $\beta = -0.16$, $SE = 1.35$, $p = 0.005$, 95 % CI [-6.47, -1.17], after controlling for covariates. Stronger caregiver-child attachment was significantly associated with less dissociation, $\beta = -0.17$, $SE = 1.85$, $p = 0.002$, [-9.30, -2.02]. Youth who had been living with their caregivers for a longer period reported more dissociative symptoms at levels that approached statistical significance, $\beta = 0.12$, $SE = 0.19$, $p = 0.06$, 95 % CI [-0.13, 0.73]. Older youth reported significantly fewer symptoms, $\beta = -0.21$, $SE = 0.68$, $p = 0.001$, 95 % CI [-4.01, -1.35]. Youth with more ACEs reported significantly more dissociative symptoms, $\beta = 0.14$, $SE = 0.52$, $p = 0.009$, 95 % CI [0.35, 2.40]. The length of time in the current episode of OOHC was not significantly associated with symptoms of dissociation, $\beta = 0.04$, $SE = 0.20$, $p = 0.51$, 95 % CI [-0.27, 0.54].

We examined whether both placement duration and the number of months in the current OOHC episode should be included in our models. Although these variables were moderately correlated, no evidence of multicollinearity was found in further analyses (VIF, collinearity tolerance, and collinearity diagnostics). However, the two variables capture highly similar constructs. Given the lack of unique predictive value of the months in the most recent episode of OOHC in the regression analysis and its conceptual overlap with placement duration, we retained only the latter as the more theoretically relevant variable in subsequent models, as it is tied to the caregiving relationship process central to the current study.

Table 1
Descriptive Statistics, Bivariate Correlations, and Multiple Regression Analysis; $N = 310$.

	<i>M (SD)</i>	Pearson Correlations							
		1	2	3	4	5	6	7	β
1. TSCC-DIS	51.02 (11.23)	–							–
2. IPPA-caregivers	2.55 (0.32)	–0.21***	–						–0.17**
3. IPPA-parents	2.52 (0.45)	–0.20***	0.15**	–					–0.16**
4. Age	10.25 (0.89)	–0.19***	0.06	–0.08*	–				–0.21***
5. Placement length (months)	6.35 (3.71)	0.16**	–0.01	–0.17**	0.01	–			–0.12*
6. ACEs	1.73 (1.14)	0.12*	–0.03	–0.04	0.15**	–0.03	–		0.14**
7. Months in episode of OOHC	7.41 (3.41)	0.14**	–0.06	–0.16**	–0.02	0.52***	–0.03	–	0.04

Note. * $p \leq 0.01$, * $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$.

Pearson r : 0.1 = small, 0.3 = medium, and 0.5 = large (Cohen, 1992).

TSCC-DIS possible t-score values had possible range from 0 to 100, where 0 = no reported symptoms. IPPA-caregiver and parent mean scores had possible range from 1 to 3, with higher scores meaning stronger attachment.

Dependent variable: Dissociation (TSCC-DIS); Independent variable: birth parents-child attachment (IPPA-parents); Covariates: caregiver-child attachment (IPPA-caregivers), Youth age, Months living with caregivers, ACEs, and months in most recent episode of OOHC.

Next, we conducted a parallel mediation analysis (see Fig. 2) to test whether the effects of birth parent-child attachment (X) on dissociative symptoms (Y) operate indirectly through two mediators—caregiver-child attachment (M_1) and placement duration (M_2), while controlling for youths' age and ACEs. Birth parent-child attachment had significant direct and indirect negative effects on dissociative symptoms, with direct effects, $B = -3.88$, $p = 0.004$, 95 % CI $[-6.52, -1.24]$, indirect effects through caregiver-child attachment, $B = -0.64$, 95 % CI $[-1.45, -0.13]$, and indirect effects through placement duration, $B = -0.59$, 95 % CI $[-1.47, -0.03]$. Results indicate that birth parent-child attachment exerts more influence on youths' dissociative symptoms than it does indirectly through caregiver-child attachment or placement duration, which partially mediated the effects. The current model explained 10 % of the variation in dissociative symptoms, $F(3, 306) = 11.39$, $p = 0.001$, $R^2 = 0.10$.

Next, we conducted a moderated parallel mediation model to test whether these effects were further conditional on youths' age, while controlling for ACEs. The overall model accounted for 17.1 % of the variance in dissociation, $F(7, 301) = 7.78$, $p = 0.0001$, $R^2 = 0.17$.

3.1. Path A: Birth parent attachment → Caregiver attachment and placement duration

The relationship between birth parent-child attachment and caregiver-child attachment was not significantly moderated by youth age, $B = -0.06$, $p = 0.20$, 95 % CI $[-0.02, 0.07]$. However, birth parent-child attachment significantly interacted with youth age in predicting placement duration, $B = -1.28$, $p = 0.02$, 95 % CI $[-2.32, -0.23]$. This association was not significant at younger ages (age 9.36), $B = -0.25$, $p = 0.70$, 95 % CI $[-1.56, 1.05]$. At the mean (age 10.25) and older ages (age 11.14), the effect became increasingly negative and significant, indicating that older youth who had been living in OOHC with their current caregiver longer reported weaker attachment to their birth parents, $B = -1.39$, $p = 0.003$, 95 % CI $[-2.29, -0.50]$; $B = -2.52$, $p < 0.001$, 95 % CI $[-3.80, -1.24]$, respectively.

3.2. Path B: Caregiver attachment and placement duration → dissociative symptoms

Caregiver-child attachment had a significant negative effect on dissociative symptoms, $B = -3.51$, $p = 0.01$, 95 % CI $[-8.22, 0.86]$, indicating that better relationships with caregivers were associated with fewer dissociative symptoms. This effect was moderated by age: at younger ages (9.36), caregiver-child attachment was strongly associated with lower dissociative symptoms, $B = -8.06$, $p = 0.001$, 95 % CI $[-12.89, -3.23]$. At mean age (10.25), the association remained significant but weaker, $B = -4.54$, $p = 0.02$, 95 % CI $[-8.23, -0.86]$, and at older ages (11.14), the effect was nonsignificant, $B = -1.02$, $p = 0.62$, 95 % CI $[-6.59, 4.55]$.

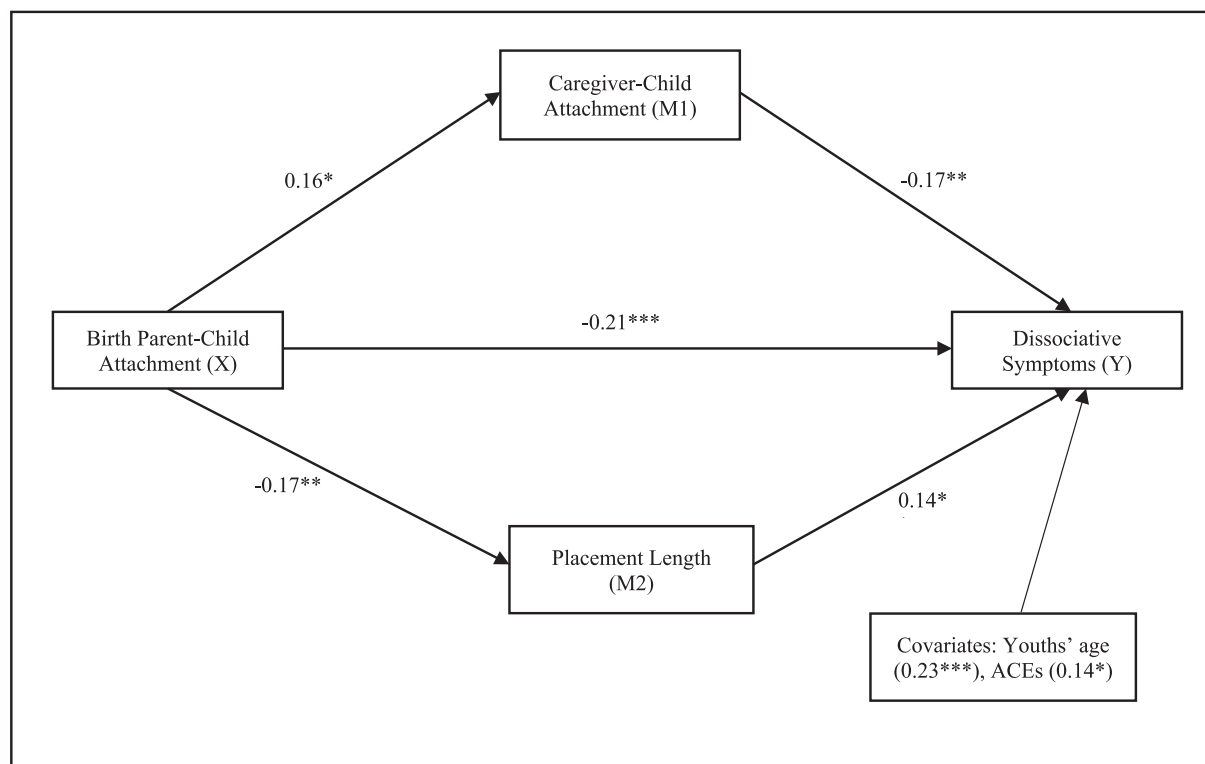


Fig. 2. Standardized coefficients of the direct and indirect effects of birth parent-child relationships on dissociative symptoms. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Placement duration was statistically significant, positively associated with dissociative symptoms, $B = 0.50$, $p = 0.003$, 95 % CI [0.17, 0.82], but the interaction with age was nonsignificant, $B = 0.29$, $p = 0.13$, 95 % CI [-0.09, 0.67].

3.3. Direct and indirect effects: Birth parent attachment → dissociation

As shown in Table 2, the direct effect of birth parent-child attachment on dissociation was conditional on age. Among younger youth (9.36), stronger birth parent-child attachment was associated with lower dissociative symptoms, $B = -6.06$, $p = 0.002$, 95 % CI [-9.81, -2.32], and was weaker but remained significant at the mean age, $B = -3.51$, $p = 0.009$, 95 % CI [-6.15, -0.87]. However, the direct effect diminished with age and became non-significant by age 11.14, $B = -0.96$, $p = 0.62$, 95 % CI [-4.71, 2.79].

The conditional indirect effects via caregiver-child attachment were statistically significant, as indicated by the conditional indirect effect and the pairwise contrast of mean age vs. older age, $B = 0.45$, 95 % CI [0.09, 1.16]. The negative indirect effect was most substantial at younger ages (e.g., age 9.36), $B = -1.34$, 95 % CI [-3.41, -0.22], where stronger birth parent-child attachment predicted caregiver-child attachment, which in turn predicted lower dissociative symptoms. This indirect effect decreased with age, but remained significant at the mean age (10.25 years), $B = -0.51$, 95 % CI [-1.24, -0.17], and became nonsignificant by age 11.14, $B = -0.06$, 95 % CI [-0.63, 0.34].

The conditional indirect effects via placement duration were statistically significant, as indicated by the conditional indirect effects and pairwise contrasts of younger versus mean age, $B = -0.63$, 95 % CI [-1.45, -0.05], younger versus older age, $B = -1.84$, 95 % CI [-4.03, -0.33], and mean versus older age, $B = -1.22$, 95 % CI [-2.73, -0.13]. The negative conditional indirect effect via placement duration was most substantial among older youth. This pathway was not significant at younger ages, $B = -0.16$, 95 % CI [-0.71, 0.39], but became statistically significant at the mean age (10.25 years old), $B = -0.69$, 95 % CI [-1.66, -0.08] and was most pronounced by age 11.14, $B = -1.90$, 95 % CI [-4.12, -0.45]. Among older youth, weaker attachment bonds with birth parents were associated with longer time in their current caregivers' homes, which in turn predicted higher dissociative symptoms.

4. Discussion

The current study examined the association between birth parent-child attachment and dissociative symptoms, as well as the age-

Table 2
Results of the parallel mediation model and moderated parallel mediation model.

Model	Path	B	t	p	95 % CI ^a	
					Lower	Upper
1. Parallel mediation	Total effect	-5.11	-3.83	0.0002	-7.74	-2.49
	Direct Effect	-3.88	-2.89	0.004	-6.52	-1.24
	Indirect effect					
	Total	-1.23	-	-	-2.39	-0.41
	Birth parent rel. → caregiver rel. → dissociation	-0.64	-	-	-1.45	-0.13
	Birth parent rel. → placement length → dissociation	-0.59	-	-	-1.47	-0.03
2. Moderated parallel mediation	<u>Conditional direct effects</u>					
	Birth parent rel. → dissociation					
	- 1 SD	-6.06	-3.19	0.002	-9.81	-2.32
	Mean	-3.51	-2.62	0.009	-6.15	-0.87
	+1 SD	-0.96	-0.50	0.62	-4.71	2.79
	<u>Conditional indirect effects</u>					
	Birth parent rel. → caregiver rel. → dissociation					
	- 1 SD	-1.34	-	-	-3.41	-0.22
	Mean	-0.51	-	-	-1.24	-0.07
	+ 1 SD	-0.06	-	-	-0.63	0.34
	<u>Pairwise contrasts</u>					
	Younger vs. mean age	0.83	-	-	-0.09	2.41
	Younger vs. older age	1.28	-	-	-0.01	3.43
	Mean vs. older age	0.45	-	-	0.01	1.16
	<u>Conditional indirect effects</u>					
	Birth parent rel. → placement length → dissociation					
	- 1 SD	-0.06	-	-	-0.71	0.39
	Mean	-0.69	-	-	-1.66	-0.08
	+ 1 SD	-1.90	-	-	-4.12	-0.45
	<u>Pairwise contrasts</u>					
	Younger vs. mean age	-0.63	-	-	-1.45	-0.05
	Younger vs. older age	-1.84	-	-	-4.03	-0.33
	Mean vs. older age	-1.22	-	-	-2.73	-0.13

Note: B, unstandardized regression coefficient; Model 1: covariates = age, ACEs, months in OOHC; Model 2: covariate = ACEs and months in OOHC; variables are centralized, conditional direct effect is reported in this table with 5000 bootstrap samples and 95 % confidence intervals.

^a 95 % CI, bias-corrected confidence interval.

dependent indirect effects of attachment to current caregivers and the length of time in their care. The first hypothesis was supported: stronger birth parent-child attachment was directly related to fewer dissociative symptoms among youth recently placed in OOH. This result aligns with previous research linking insecure or disrupted parent-child attachment with increased dissociation (Bailey & Brand, 2017; Paetzold et al., 2017), as well as evidence linking childhood maltreatment to dissociation (Kong et al., 2018; Schimmenti and Carretti, 2016). This direct effect was most prominent among younger children, becoming nonsignificant for older youth. Research has shown that younger children and those who experienced ACEs earlier in life may be more likely to experience dissociation (Hagan et al., 2018; Kisiel et al., 2020; Vonderlin et al., 2018), but the relationship between age and dissociation appears to be context and developmentally dependent. These findings extend this body of research by clarifying how youths' age influences the relationship between parent-child attachment and dissociative symptoms.

The moderated mediation model largely supported our second hypothesis. The association between birth parent-child attachment and dissociative symptoms was partially mediated by both caregiver-child attachment and placement duration. The indirect effect through caregiver-child attachment was significant among younger youth, for whom stronger parent-child attachment was associated with stronger caregiver-child attachment and lower levels of dissociation. While research has demonstrated a link between relationship quality with foster caregivers and youth mental health (Rayburn et al., 2018; Wojciak et al., 2017) and well-being (Maaskant et al., 2015), our findings provide evidence supporting the importance of youths' relationships with both birth parents and caregivers in preventing trauma-related symptoms. Importantly, these relationships need not function in opposition (Maaskant et al., 2015), but their influence on dissociation appears to vary by age. Younger children may be especially sensitive to the emotional availability and security offered by caregivers, making these relationships critical for buffering trauma symptoms. It is also possible that older youth may take longer to establish a trusting relationship with their caregivers, especially given the relatively recent entry into care among the current sample.

Contrary to expectations, the indirect effect through placement duration was strongest among older youth, for whom a longer placement predicted weaker birth parent-child attachment, an association that lessened with age. Other factors, like the frequency of parental visits, might influence these relationships; research indicates that less contact with biological mothers and older age are linked to longer stays in OOH and poorer mental health outcomes (McWey et al., 2022). Interestingly, a longer placement was also significantly associated with higher levels of dissociation; this relationship was not dependent on age. This could suggest that youth might experience extended placements not as stability but as ongoing relational losses, leading to disconnection that may reinforce dissociative coping. Alternatively, children in more extended placements may feel more secure and therefore more willing to share distressing symptoms they are experiencing.

4.1. Implications for practice

These findings underscore the importance of supporting healthy attachment relationships with birth parents and caregivers to enhance their safety and prevent long-term trauma-related outcomes. OOH caregivers frequently facilitate visitation and contact with birth parents (Nesmith et al., 2017). Their approach to this role can shape youths' relationships with their birth parents, their mental health (Rayburn et al., 2018; Storer et al., 2014), and decrease the likelihood of feeling conflicted as they navigate their relationships with their birth families and their current caregivers (Nesmith et al., 2017). Consequently, caregivers need to be adequately prepared and supported in navigating challenges related to visitation. In addition to support from caseworkers, training programs such as the National Training and Development Curriculum for Foster and Adoptive Parents (NTDC; ntdctraining.org) can provide caregivers with a trauma-informed approach to prepare them for their roles in providing stability in the caregiver-child relationship and the home environment. For youth living in OOH, this could be a key time to intervene by fostering relational healing and preventing pervasive negative coping patterns. Establishing a sense of safety, security, and consistency in their home environment can lay the foundation for healing and, when indicated, therapeutic intervention.

A critical precursor to evidence-based interventions (EBIs) includes assessment and proper identification of trauma-related dissociation and disruptions in attachment. Individuals spend an average of 5 to 12 years in *active* treatment before receiving an accurate diagnosis (Boyer et al., 2022). This considerable length of time is concerning, considering the adverse impacts of living with PTSD-DS. Screening youth involved in child welfare systems for dissociation and utilization of more focused, validated scales is crucial to preventing under-identification and associated poor outcomes (Bailey & Brand, 2017). Furthermore, assessing the context in which dissociation occurs is crucial for treatment outcomes (i.e., dissociating during a trauma-focused intervention, which may potentially decrease intervention efficacy; Bailey & Brand, 2017).

Research supports the use of trauma-focused treatment modalities for PTSD-DS (Wolf et al., 2016; Zoet et al., 2018), including Prolonged Exposure Therapy, Eye Movement Desensitization and Reprocessing (EMDR), Cognitive Behavioral Therapy, Dialectical Behavior Therapy, Internal Family Systems (IFS), and Sensorimotor Psychotherapy (International Society for the Study of Trauma and Dissociation, 2011). Additionally, somatic and body-based modalities may offer options for addressing disembodiment and disconnection from a sense of self (Classen et al., 2021). Given the findings of the current study, EBIs that involve birth parents and caregivers should be considered when appropriate. Several EBIs exist that center on the caregiver-child relationship and could be implemented with birth parents and/or caregivers, including Child-Parent Psychotherapy (CPP; Lieberman et al., 2015), Mom Power (Rosenblum et al., 2018), and Child FIRST (Child and Family Intra-agency, Resource, Support, and Training; Lowell et al., 2011). Additionally, FHF has demonstrated reduced dissociation and trauma symptoms post-intervention (Taussig et al., 2019; Taussig & Culhane, 2010).

4.2. Limitations and future directions

This study has several limitations. Attachment and dissociation were assessed through youth self-report questionnaires rather than observational methods or clinician-rated assessments. Self-report measures of these constructs provide important insight into participants' subjective experiences, and the dimensional measures enabled us to retain a larger sample. However, they are not diagnostic, and findings should be interpreted with this in mind. While there was considerable variability in dissociation scores using the dimensional measure, the mean score was below clinical levels. Notably, some level of dissociation is expected and normal, especially among children, and does not necessarily predict future psychopathology. Additionally, as a cross-sectional and non-experimental study, temporal precedence cannot be established. The possibility of bidirectionality should be considered; for example, youth with higher dissociative symptoms may struggle to form secure bonds with caregivers or may report weaker relationships with their birth parents. Prior work notes that PTSD symptoms can disrupt trust and relational functioning, particularly when earlier trauma occurred within close attachment relationships (Djelantik et al., 2020). Additionally, while we accounted for the time spent living with their current caregivers and the number of caregiver transitions as part of the ACEs index, we were unable to control for the lifetime duration the youth had spent in OOHC beyond the current episode of care, which could influence our results. Further, because the ACEs index accounted for six types of adversity, it is possible that other ACEs not included in our models influenced outcomes.

This work extends prior research on parent-child attachment and dissociation among youth in OOHC, offering insights into the mechanisms underlying these relationships from a developmental perspective. Future research should incorporate multimethod assessment, longitudinal designs, and differential diagnosis to clarify the developmental pathways of dissociation, illuminate how relationships with caregivers and birth parents evolve, and differentially predict acute versus chronic dissociative responses. Understanding these developmental trajectories is crucial for distinguishing youth whose dissociation is a temporary stress response from those for whom it develops into a pervasive, maladaptive coping mechanism that persists into adolescence and adulthood.

CRedit authorship contribution statement

Jenna N. Thompson: Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Conceptualization. **Amy M. Salazar:** Writing – review & editing, Supervision. **Heather N. Taussig:** Writing – review & editing, Supervision, Investigation, Funding acquisition.

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Declaration of competing interest

We have no known conflict of interest to disclose.

Data availability

The data that has been used is confidential.

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