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► **To cite this version:**

Camille Danner Touati, Raphaële Miljkovitch, Aino Sirparanta, Anne-Sophie Deborde. The role of attachment to the foster parent with regard to suicidal risk among adult survivors of childhood maltreatment. *Child Abuse & Neglect: The International Journal*, 2022, 128, pp.104886. 10.1016/j.chiabu.2020.104886 . hal-03785447

HAL Id: hal-03785447

<https://hal.science/hal-03785447>

Submitted on 22 Jul 2024

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RESEARCH ARTICLE

The role of attachment to the foster parent with regard to suicidal risk among adult survivors of childhood maltreatment

Short title: Attachment to foster parent and suicidal risk

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Acknowledgments:

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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Suicide represents the second cause of death among adolescents and young adults from 15 to 29 years of age (OMS, 2014). Exposure to childhood maltreatment (abuse and neglect) constitutes a risk factor for suicidal risk (SR) over the lifespan (Anda et al., 2006; Dube et al., 2001; King & Merchant 2008; Miller et al., 2013). SR includes suicidal ideation, suicide attempts, and completed suicide. In case of maltreatment, out-of-home placement is aimed at removing the child from a harmful environment and at providing the protection and security that are necessary for proper development. A recent study suggests that attachment security to a foster parent reduces behavior problems in foster children (Dubois-Comtois et al., 2015). In a similar fashion, the main objective of the present study is to examine whether the relationship with a foster parent reduces SR associated with maltreatment.

Out-of-family placement is aimed at reducing the deleterious effects of early maltreatment through the establishment of a secure relationship with a surrogate attachment figure. Children are thus removed from their biological families and placed either in an institution, under the responsibility of a social worker or an educational team, or in a foster home where they are entrusted to a foster parent. However, although out-of-home placement is aimed at protecting children, the effectiveness of this type of care in reducing SR associated with experiences of maltreatment still needs to be established given the high rates of SR among out-of-home placed children (Rhodes et al., 2012). Considering all types of out-of-home care, the overall prevalence of suicidal ideation is estimated between 10.24% and 28% (Charrel et al., 2009; Gabrielli et al., 2015; Harkess-Harpin & Maguire, 2014; Murphy et al., 2013; Pilowsky & Wu, 2006; Taussig et al., 2014). Depending on the study, suicide attempt rates vary between 14% and 30% (Bronssard et al., 2011; Charrel et al., 2009; Pilowsky & Wu, 2006). According to Evans et al.'s (2017) meta-analysis, suicide attempts

are over three times more frequent among children and youth in out-of-home care in comparison to the general population. The prevalence of suicide attempts is 3.6 % versus 0.8 %. The estimated prevalence of suicidal ideation is 24.7 % among institutionalized and foster children and youth versus 11.4 %. Furthermore, these rates are confirmed among adults who received out-of-home care during childhood for whom the suicidal risk is 2 to 5 times higher than in the general population (Christoffersen et al., 2003; Hjern et al., 2004; Vinnerljung et al., 2006). These studies provide data mostly on developed countries and associations may be different in other less developed countries where child protection policies as well as quality of out-of-home care are different. In any case, existing studies do not indicate whether SR is higher among institutionalized and foster children as compared to maltreated home-reared children. Then again, the fact that children who are placed are those who could not be safely protected at home would automatically lead to a biased comparison, as the deleterious effects of former experiences of maltreatment seem to persist over time.

In fact, even in the case of institutionalization or foster care, the effects of maltreatment continue to be observed: Taussig et al.'s (2014) study shows that one year after out-of-home placement, sexual abuse, physical abuse, and chronicity of maltreatment strongly predict SR. Likewise, other studies indicate that pre-placement physical and sexual abuse as well as psychological maltreatment increase the risk of suicide attempts among children in out-of-home care (Brodsky & Stanley, 2008; Evans et al., 2005; Mironova et al., 2011; Rogers, 2003; Sigfusdottir et al., 2013 ; Thompson et al., 2005).

The increased SR associated with childhood abuse can partly be explained by the impact of maltreatment on attachment. Out-of-home placement occurs when caregivers are not able to ensure the safety of their child and a number of studies emphasize the importance of attachment security for mental health (Dozier et al., 2008; Mikulincer & Shaver, 2007). Maltreatment is considered to be one of the main causes of disorganized attachment (Cyr et

al., 2010; Van IJzendoorn et al., 1999) as it is thought to hinder the development of a coherent attachment strategy in times of stress (Main & Hesse, 1990). Insecure and especially disorganized attachment constitute risk factors for psychopathology (Fearon et al., 2010; see Groh et al., 2012 for a meta-analysis; Lyons-Ruth & Jacobvitz, 2008; Moss et al., 2004). According to Adam (1994), attachment insecurity in childhood may represent a vulnerability factor for SR over the lifespan. He suggests that, in response to current experiences of rejection, loss, or disappointment, childhood insecurity may predispose to “an attachment crisis” characterized by intense distress and inadequate coping mechanisms that can lead to SR. Empirical data confirm the link between insecure or disorganized attachment and SR among adolescents (Adam et al., 1996 ; Di Filippo et al., 2000 ; Lessard et al., 1998) and adults (Boroudjerdi et al., 2019; Grunebaum et al., 2010; Johnson et al., 2010; Minitati et al., 2017; Stepp et al., 2008; Riggs et al., 2002;). Given that childhood maltreatment is associated with attachment insecurity and disorganization, which, in turn, are associated with an increased SR, the link between maltreatment and SR can be expected to be mediated by attachment to maltreating parents. A recent study demonstrated that attachment disorganization mediates the association between sexual abuse and behavior problems in preschool children (Charest et al., 2018). Among adults, Restrepo et al. (2016) and Allbaugh and Mack ‘s (2018) studies demonstrated that attachment insecurity increases along with maltreatment and that both of these variables explain a part of the variance of suicidal ideation. Taken together, these results highlight the crucial role of attachment for mental health and may suggest that it carries forward the impact of maltreatment on subsequent psychopathology. No study has documented this mediated process among adult survivors of childhood maltreatment nor with respect to SR. Whether such a process could be at play among survivors who received out-of-home placement is also unclear.

Research suggests that in the case of foster care, children can develop a secure attachment relationship with a foster parent in parallel to the relationships with their biological parents (Dozier et al., 2001; Moore & Palacio-Quintín, 2001; Ponciano, 2010). The results of a study by Deborde et al. (2016) show that institutionalized and foster children report being more secure with their foster parent or foster care consultant than with their biological parents. Other studies suggest that the quality of the relationship between children and their foster parents constitutes an important protective factor against the onset of mental disorders. Among placed adolescents, a positively perceived relationship with a foster parent was associated with reduced mental health problems (Cooley et al., 2015; Guibord et al., 2011; Yoon et al., 2015). Other studies suggest that it may be specific aspects of that relationship, such as emotional security with the foster parent (Dubois-Comtois et al., 2015; Joseph et al., 2014; Rayburn et al., 2018; Storer et al., 2014) that contribute to decreased mental disorders.

The current study

Despite the number of studies on suicidal risk among institutionalized and foster children, to our knowledge, no study has shown the benefit of out-of-home care and, more specifically, that provided by attachment to the foster parent in terms of preventing SR. Consequently, in line with the cited studies, the main objectives of this research were to investigate (1) whether attachment to each biological parent mediates the association between maltreatment and SR and (2) whether attachment to a foster parent reduces SR directly or by moderating the associations between maltreatment and SR, and between attachment to biological parents and SR.

METHOD

Participants

All participants received out-of-home care in France during childhood. According to the French Civil Code “if the health, security, or morality of a minor child are in danger, or if the conditions for his/her education or of his/her affective, intellectual, and social development are severely compromised, measures of educational assistance can be ordered by justice”. Thus, participants were placed in an institution or a foster family when multiple measures had been carried out for them or their families but had proven unfruitful in preventing maltreatment, or when families had refused interventions proposed by the child welfare agency and a court-ordered or voluntary placement had hence been decided. One hundred and seven adults whose records documented past maltreatment were contacted to take part in the study. Twenty-eight percent of them (86.7% males and 13.3% females) refused to participate. The final sample thus comprised 77 participants, 25 males and 52 females, who received out-of-home care during childhood. The mean age of participants was 26 years and 8 months ($SD= 8.07$) and ranged from 18 to 53. The reasons for out-of-home placement and case file information indicate that 93.5 % of participants had experienced emotional neglect, 63.6% physical neglect, 35.1% emotional abuse, 75.3% physical abuse, and 64.9% sexual abuse. All participants had experienced multiple forms of maltreatment. (Note that the child welfare system does not provide specific interventions for poly-victimized children). Abuse (i.e. physical, sexual and emotional) was perpetrated by fathers in 93.5% of the cases and by mothers for the remaining 6.5%. In the study population, 31.2% did not exhibit SR, 7.8% had suicidal ideation, 40.3% had attempted suicide once, and 20.8% had attempted suicide at least twice.

Procedure

Participants were recruited throughout France via child welfare services and networks of former institutionalized and foster children. Child records were made available to identify those who had been placed following maltreatment. Participants were contacted by phone in order to inform them of the study and to fix an appointment. Prior to their enrollment in the study, participants were given an information note describing the study after which they gave their written consent. Depending on how far they lived, participants were either met individually or interviewed by phone following the same procedure (no differences on study variables were observed between participants interviewed by phone and those seen in person: all $t_s < 1.42$, NS). Questionnaires and interviews were administered during two sessions that lasted on average an hour and a half. First, the participants filled the self-report questionnaires (participants living outside the Paris region filled them online): a questionnaire assessing sociodemographic characteristics and child welfare history, and the Childhood Trauma Questionnaire (CTQ). To avoid biased responses, case file records were consulted to substantiate and complete participants' reports. During the second session, a psychiatric evaluation, following the DSM criteria, was conducted with a semi-structured interview (MINI) in order to assess lifetime suicidal risk, and an interview tapping the participants' attachment representations (AMMI) was administered. At the end of each session, participants were systematically proposed debriefing with the psychologist in charge of the study. Participants had the possibility to contact the psychologist if they had inquiries about the study or wanted to talk about how they felt after the assessments. None contacted the psychologist after participating in the study. In order to guarantee confidentiality, data was collected anonymously and files were stored under lock outside the institution. All the participants gave their informed consent to be enrolled in the study. The study was conducted in accordance with the terms of the institution's ethics and adhered to the tenets of the Declaration of Helsinki.

Measures

Childhood Trauma Questionnaire (CTQ) (Bernstein et al., 2003, French version : Paquette et al., 2004). The CTQ is a 28-item self-report inventory that provides information on the level of abuse experienced during childhood and adolescence assessed according to five dimensions: emotional neglect, emotional abuse, physical neglect, physical abuse, sexual abuse along a 5-point scale from 1 (never true) to 5 (very often true). The psychometric validity of CTQ has been established in a number of studies (Bernstein et al., 1994; Bernstein & Fink, 1998).

Attachment Multiple Model Interview (AMMI) (Miljkovitch, 2009; Miljkovitch et al., 2015). The AMMI is a semi-structured interview that includes about twenty questions concerning situations likely to activate the individual's attachment system (ex: fear, separation, injury...). Participants are asked to talk about specific memories and to describe their behavior in specific situations ("how did you react?") as well as their associated emotional reactions ("how did you feel?"). The AMMI assesses attachment security and attachment strategies (deactivation, hyperactivation, and disorganization of the attachment system) in relation to each investigated relationship (mother, father and foster parent). Scores ranging from 0 to 8 (or from 0 to 16 for disorganization) are thus assigned on each attachment dimension in relation to mother, father and foster parent. The validity of the AMMI has been established with longitudinal data gathered from ages 4 to 23, showing that AMMI scores at age 23 reflect corresponding cumulated lifetime scores for security, deactivation, and hyperactivation (Miljkovitch et al., 2015). Concerning the disorganization scale, expected links with unresolved trauma (according to the Adult Attachment Interview; George et al., 1985) and with borderline personality disorder provide further confirmation of its construct validity (Miljkovitch et al., 2015, 2018). Interjudge reliability was, respectively, $r = .96$ ($p \leq .00$) for security, $r = .91$ ($p \leq .00$) for deactivation, $r = .87$ ($p \leq .00$) for hyperactivation,

and $r=.79$ ($p\leq.00$) for disorganization. Wilcoxon tests also confirmed good interrater reliability for all the scales (all $ps >.23$).

Mini International Neuropsychiatric Interview Interview (Sheehan et al., 1998; Lecrubier et al., 1998 for the French version). The MINI is a diagnostic structured interview developed to assess the main Axis I DSM-IV psychiatric disorders, as well as present (in the past month) and lifetime suicide attempt(s). The validity of the MINI has been established by a number of studies (for example Pinninti et al., 2003). Only SR was examined for the present study. Current level of risk was measured according to 5 items on participants' (a) wish to be dead (1 point), (b) wish to hurt themselves (2 points), (c) thoughts about suicide (6 points), (d) thoughts about ways of committing suicide (10 points), and (e) actual suicide attempts (10 points). An additional item enables specification of lifetime risk, "In your lifetime, did you ever make a suicide attempt?" (4 points). Based on their responses to these items, participants were classified as being at low (score 1-5), moderate (score 6-9), or high suicidal risk (score ≥ 10).

Statistical Analyses

To test our hypothesis, we used the PLS approach (PLS-PM; Vinzi et al., 2010). It is a structural equation modeling technique that does not rely on the assumption of normal distributions and can be used on small samples. In this type of statistical analysis, a global model is constructed. All independent variables (IV: mother attachment, father attachment, foster parent attachment, and maltreatment) and the dependent variable (DV: suicidal risk) are entered at once in the initial model. Then, the variables with non-significant coefficients are removed to build the final model. In the final model, the dependent variable is modeled as a function of the independent variables.

Two models have been used to describe the PLS-PM: (1) the measurement model (also called outer model) that describes the relations between the manifest variables (MV) and their latent variables (LV) and (2) the structural model (also called inner model) that describes the relations between latent variables. Bootstrapping was used to assess the significance of the coefficients. The PLS-PM analyses were conducted with R software, version 3.0 (Ihaka & Gentleman, 1993, 2015).

Results

Descriptive Analyses

Participants' SR scores and scores on the CTQ and the AMMI are displayed in Table 1. The mean score on the SR scale is 1.51 ($SD = 1.14$). The mean scores on the CTQ subscales are 22.3 ($SD = 4.26$) for emotional abuse, 17.3 ($SD = 6.04$) for physical abuse, 16.3 ($SD = 7.92$) for sexual abuse, 8.44 ($SD = 2.35$) for emotional neglect, and 7.67 ($SD = 4.27$) for physical neglect. Mean age at the time of placement is 8.75 years ($SD = 4.97$) and mean age at the time of the study is 26.9 years ($SD = 8.06$). The length of placement was on average 8.84 years ($SD = 5.02$).

Regarding attachment, scores on the AMMI dimensions in the relationship to each parent are comparable. Security scores towards each parent are particularly low, but especially homogenous with regard to the father [0-1]. Deactivation scores with regard to both parents are comparable ($t = -1.87, p = .07$), but hyperactivation and disorganization are

slightly higher with the mother (respectively $t = -3.10, p < .00$ and $t = 2.65, p = .01$). Security with the foster parent is higher than security with the mother ($t = 11.02, p < .00$) or the father ($t = 21.06, p < .00$). Deactivation, hyperactivation, and disorganization scores with the foster parent are lower than scores with either parent (all $ts < -1.80, p < .00$) and are all below 5.

Participants' age, gender, and length of placement were controlled for in the analyses. Institutional and foster caregivers were included in the present study indiscriminately (institutional vs foster) as no differences were found in attachment scores between these two types of caregivers (all $ts < 1.25, NS$) nor in SR when length of placement was controlled for ($p = .51$).

Main analyses

Outer Model

The Manifest Variables (MV) and the Latent Variables (LV) of our initial conceptual model are presented in Table 2. First, a complete model, in which each LV is composed of all of the corresponding MVs, was defined. The theoretical model thus included 38 MVs (outer model) loaded onto 10 LVs (inner model).

Then the unidimensionality test was performed in order to select the variables for the final model. The LV Attachment Father was removed because the corresponding coefficients were non-significant. Ten MVs were removed (non-significant coefficients): MV deactivation and MV hyperactivation (i.e. mother, foster parent (FP), mother*foster parent, maltreatment*foster parent) for the LV attachment. In the end, the outer model included 24 MVs loaded on 9 LVs that corresponded to the following factors: suicidal risk, attachment to mother, attachment to foster parent (FP), maltreatment, mother*foster parent, maltreatment*foster parent, length of placement, gender and age. The descriptive statistics for the latent and manifest variables of the final model are displayed in Table 2. The

unidimensionality and the cross-loadings of all of the LVs show that the quality of the outer model is significant (all DG-rho > 0.70) (Table 3).

Inner Model

The inner model was built to study the relationships between maltreatment (sexual abuse, physical abuse, emotional abuse, physical neglect, and emotional neglect), attachment (security and disorganization) to the biological mother, attachment (security and disorganization) to the foster parent, length of placement, gender, age, and suicidal risk. The Goodness of Fit (GOF) was 0.40. The proportion of explained variance (R^2) for the LVs is presented in Table 2. The direct and indirect coefficients (bootstrap with 95% confidence interval) are presented in Table 4. Figure 1 shows the coefficients (β) between the LVs for the inner model.

The direct links showed a strong association between attachment to mother and suicidal risk ($\beta > 0.48$). The results indicated an association between maltreatment and attachment to mother ($\beta > 0.28$), and between maltreatment and SR ($\beta > 0.19$). We also found a negative association between length of placement and SR ($\beta > -0.31$). No significant links were found between gender and SR, or between age and SR. The association between attachment to the foster parent and SR was non-significant. However, the results show a moderating effect of attachment to the foster parent (Mother*foster parent) on the link between attachment to the biological mother and SR ($\beta > -0,28$) (Table 4). Attachment to the foster parent does not however moderate the link between maltreatment and SR. The indirect links indicated that the effect of maltreatment on SR through attachment to the mother was significant (Table 4).

Additional analyses were conducted to break down the mother*foster parent interaction. To examine the moderating effect of the mother on the foster parent-SR link, we split the sample into two groups, one below the median score of mother attachment and one

above this score. We then examined for each group the association between attachment to the foster parent and SR and found that for the group with lower scores of insecurity/disorganization to the mother, the link was positive and highly significant ($r = .68$, $p < .01$). For the group with higher scores of insecurity/disorganization to the mother, the link between attachment to the foster parent and SR was not significant ($r = -.17$). We also followed the same procedure to examine the moderating role of the foster parent and found that for the group with lower scores of insecurity/disorganization to the mother, the foster parent*RS link was also positive and high ($r = .68$, $p < .01$). For the group with higher scores of insecurity/disorganization to the mother, the link between insecure/disorganized attachment to the mother and SR was close to zero ($r = .03$). In other words, the increased SR associated with attachment to the mother becomes non significant when attachment to the foster parent is good (low insecurity and disorganization).

Discussion

Understanding the mechanisms underlying suicidal behavior is essential for adapting prevention efforts in the child welfare system. In this end, the aim of the present study was to propose a model that examines both the mediating role of attachment to each biological parent in the link between childhood maltreatment and SR, and the moderating effect of attachment to the foster parent on the direct and indirect effects of childhood abuse with respect to SR.

In the process, we examined the role of different types of childhood maltreatment (i.e. physical, sexual, and emotional abuse, and physical and emotional neglect) on SR. First, the results showed that childhood maltreatment (all types of maltreatment combined) was associated with SR in adulthood. Our results confirm those of previous studies (Brown et al., 1999; Taussig et al., 2014; Zoroglu et al., 2003) that show a link between abuse and SR in childhood, but extend these findings to adults who were formerly placed in out-of-home care.

It is interesting to note that 78% of our study participants were placed in out-of-home care after age 6. Also, length of placement was negatively associated with SR. Thus, delayed removal from parental care (and longer exposure to abuse) can partly explain why the effects of childhood abuse seem so long-lasting and why out-of-home placement did not significantly counteract the effect of maltreatment. Nevertheless, the longer children were in out-of-home care, the lower their SR was in adulthood. In future studies, it would be useful to consider the duration of maltreatment, as well as the age at which it began in order to better evaluate the effects of out-of-home placement in protecting against the consequences of maltreatment.

When the different types of abuse were examined in our model, only sexual abuse was associated with an increase in SR. The role of sexual abuse as a factor that increases SR in childhood (Beautrais, 1996; Bebbington et al., 2009; Devries et al., 2014) and adulthood (Zlotnick et al., 2001) has been established in the literature. However, to our knowledge, no study has investigated in a single model the role of each type of childhood maltreatment and considered the effect of sexual abuse while controlling for those of all the other forms of maltreatment. These results are important as they help identify those victims of childhood maltreatment who are the most vulnerable and the most likely to exhibit high SR.

In accordance with findings in infancy and early childhood (Cyr et al., 2010; Van IJzendoorn et al., 1999), our results confirm a link between childhood abuse and attachment, namely insecure and disorganized attachment. Our results show that this link is also observed in adulthood, at the level of representations. Interestingly, age was not correlated with attachment to mother, despite the fact that participants' age varied from 18 to 53. In other words, insecurity and disorganization in the relationship with the mother did not decline with age. Longitudinal research would be needed to examine whether attachment to parents among adult victims of childhood maltreatment evolves over the years or whether the experience of

abuse seems to crystallize attachment representations. Perhaps also, victims' tendency to be insecure/disorganized with their mothers in adulthood may reflect stability of maternal responses.

Our findings also show that the quality of attachment is not only determined by exposure to maltreatment as suggested by previous studies (Cyr et al., 2010; Van IJzendoorn et al., 1999), but also by its severity. Levels of attachment insecurity and disorganization with the mother increase along with severity of childhood maltreatment. Conceptualizing disorganization, and not only insecurity, as a dimension thus seems pertinent and allows a finer measurement. Furthermore, it would be interesting to investigate whether the link between severity of maltreatment and level of insecurity/disorganization is also observed in children and whether it is mediated by maternal behavior. Even if mothers are not abusive, maternal behavior, especially frightened/frightening behavior (Main & Hesse, 1990), may partly stem from the climate of violence they are exposed to (as well as their children) and may, in turn, have a negative impact on child attachment.

Our results are also consistent with previous studies using self-report questionnaires or the Adult Attachment Interview (George et al., 1985), which assesses overall states of mind with respect to attachment (see Adam et al., 1996; Miller et al., 2017). However, in comparison to these studies, the instrument used in the present study allows the assessment of attachment to each specific attachment figure (i.e. mother, father, and foster parent). Thus, our findings highlight the fact that it is attachment to the mother—not the father—that best accounts for SR. It may seem surprising that no effect of attachment to the father on SR was found given that fathers perpetrated the abuse in 93.5% of the cases versus 6.5% for the mothers. In addition, sexual abuse was perpetrated by fathers in 100% of the cases. The non-significant contribution of attachment to the father in explaining SR in the present study does not imply that the relationship with the father has no impact on their children. This finding

can rather be explained by the absence of a control group and by the homogeneity of our sample with respect to AMMI attachment scores with the father: in particular the security scores ranged from 0 to 1 on an 8-point scale. Given that virtually no differences were observed with respect to attachment to the father, differential effects of attachment scores on SR could not be found. This points to the fact that even when childhood maltreatment is perpetrated by the father, attachment to the mother may play a critical role in reducing suicidal risk. This result is important as it suggests the continuing importance of this relationship despite out-of-home placement.

In fact, beyond the direct effect of childhood maltreatment, the PLS-PM model shows that the effect of childhood maltreatment on SR is also mediated by attachment security and disorganization with the biological mother. A high level of exposure to childhood maltreatment is associated with a high level of attachment insecurity and disorganization in the relationship with the mother, which in turn, is linked to increased SR. Our results on adults are similar to those of previous studies on children (Charest et al., 2018; Hébert et al., 2020) that show a mediating effect of disorganized attachment on adjustment following sexual abuse. While these studies assessed overall attachment representations, our findings suggest that it is more specifically attachment to the mother, which is determining in carrying forward the effect of childhood maltreatment, in addition to the direct effect of maltreatment severity. In other words, severity of maltreatment is associated with increased SR, but added to this is the impact of insecure/disorganized attachment to the mother that also contributes to increased SR, thus partially mediating the effect of maltreatment. Perhaps the inherent experience of vulnerability and helplessness associated with maltreatment, when it is “reinforced” by the mother’s incapacity to provide protection, consolidates the initial feeling one is unable to find efficient ways of being assisted in overcoming distress and obtaining security (i.e., insecure and disorganized attachment) associated with SR. The importance of

attachment to the mother in adulthood, sometimes decades after the initial experience of maltreatment, may in part be due to the fact that in most cases, contact with the mother is maintained over the years. It is interesting to note that the mother-child relationship seems to be central despite the fact that our study participants had been placed in out-of-home care. It is also important to keep in mind that these results specifically relate to adults, whose two parents were judged unfit to care for them. Thus, our results cannot be generalized to all victims of childhood maltreatment, especially those whose mothers were able to provide adequate protection and security (Facombre et al., 2017; Tereno et al., 2017). Our findings emphasize the importance of interventions aimed at enhancing the quality of mother-child attachment.

Our results also show that SR is mostly associated with insecure and disorganized attachment. Suicidal behavior can reflect these attachment patterns in that they may, per se, represent disorganization in the face of insecurity: Suicidal behavior may reflect a combination of hyperactivation in that it may constitute a desperate means of calling for attention, and of deactivation in that this call for attention is concealed and reflects an inability to efficiently ask for assistance (Miljkovitch, 2017).

In addition to the role of attachment to biological parents, our study brings new light on the possible impact of attachment to a foster parent (i.e. institutional caregiver or foster parent). Although it does not directly affect SR, nor does it act directly upon the effects of maltreatment, it seems to potentially reduce the negative effect of insecure/disorganized attachment to the mother. Among participants with more insecure and disorganized attachment with their foster parent, attachment to the mother predicted SR. Conversely this link was not significant among those who displayed better quality attachment to their foster parent. These results are very encouraging as they suggest that a foster parent may help counteract the deleterious effects of insecure/disorganized attachment to the mother with

respect to SR. Possibly, the relationship with a foster parent may favor the development of an alternative internal working model of attachment likely to challenge the internal working model of the mother, and thereby reduce its impact (see Miljkovitch et al., 2018 for similar findings with regard the protective role of a secure relationship in borderline personality disorder). The foster parent could thus serve as an alternative attachment figure and provide what Bowlby (1988) called “a corrective experience” likely to mitigate the effect of attachment to the biological mother.

Our analysis thus suggests that the quality of attachment with a foster parent is an important factor involved in the reduction of SR. These results are in agreement with previous investigations that have demonstrated the protective role of a foster parent on mental health among children and youth in out-of-home care (Cooley et al., 2015; Guibord et al., 2011; Yoon et al., 2015), and provide more specific information concerning SR. Furthermore, our findings suggest that the effect of attachment to the foster parent on SR is observable even in adulthood. And while previous studies investigated adolescents’ overall perceptions of their relationship with the foster parent, we assessed attachment to the foster parent via a semi-structured interview. This enabled us to circumvent problems such as social desirability and to tap attachment strategies participants were unaware of. Overall, this result points to the importance of interventions aimed at supporting the establishment of a secure attachment relationship between children in care and their foster parents (Dozier et al., 2006; Moss et al 2011). Further research aimed at determining under what conditions secure attachment can occur in the context of out-of-home care and whether this could be related to professional training or funding also seems warranted.

Limitations

Despite these new findings, this study has limitations that must be acknowledged. First, among the different variables related to out-of-home placement and likely to affect SR, our study focused solely on the relationship with the foster parent. Future studies examining the link between different contextual factors likely to affect SR among institutionalized and foster children (eg., age at the time of placement, number of placements, type of placement, contact with abusive parents, separation from a foster parent...) could provide additional insight. Second, due to the main objective of our study, we did not include a control group of adult victims of childhood maltreatment who had not received out-of-home care. The effects of childhood maltreatment and attachment to mother on SR should thus be interpreted with caution. Comparison with a control group would seem useful to fully grasp the impact of early maltreatment and whether it is similar when children are not removed from their homes. Then again, maltreated children who are not placed in out-of-home care are likely to not experience the same level of abuse as those who receive out-of-home care. This further emphasizes the importance of considering severity of maltreatment rather than its mere occurrence.

We examined SR as the outcome variable of maltreatment and attachment to the foster parent rather than associated psychopathologies such as depression or post-traumatic stress disorder. Further studies should examine how these other related disorders articulate with the variables examined here.

Although the PLS-PM analysis tested a model with specified directional links, the cross-sectional design of the study calls for great caution as to actual causal effects (e.g., the presumed impact of attachment to mother on SR). Longitudinal studies would be useful to better ascertain the chronology of the sequences identified in the present study.

It is also important to note that abuse (i.e; sexual and physical) was especially frequent in our sample, implying that our results may be more representative of abused

victims than in most childhood maltreatment samples. Finally, the high refusal rate (especially among males victims) calls for even greater caution in the generalization of our findings.

Clinical Implications

Despite these limitations, the present study has important clinical and empirical implications. It appears that attachment to the mother plays a central role in the adjustment of victims of childhood maltreatment: Insecurity and disorganization in the relationship with her better accounted for SR than severity of maltreatment. This result stresses the importance of interventions aimed at enhancing the quality of mother-child interactions and that have shown to be effective in increasing attachment security and in reducing attachment disorganization (Moss et al., 2011; Tereno et al., 2017; Valentino, 2017). These interventions seem particularly recommended in the case of childhood abuse, as they have proven more effective with this type of population in comparison to non-abused children (Facompre, Bernard et Waters, 2017).

Furthermore, given our finding on the protective effect of secure/organized attachment to the foster parent, interventions taking place during out-of-home placement can be aimed at supporting this relationship, especially when quality of interactions is poor. As mentioned earlier, attachment-based interventions are effective in modifying the trajectories of institutionalized and foster children (for example, Dozier et al., 2006; Dubois-Comtois et al., 2012). The Attachment Video-feedback Intervention (AVI; Moss et al., 2011), the Attachment and Biobehavioral Catch-Up (ABC; Dozier et al., 2006), or the Promoting First Relationships (PFR; Kelly et al., 2008) have shown to be effective among children in out-of-home care (Cyr et al., under revision; Moss et al., 2011; Spieker et al., 2012) and thus seem appropriate for buffering the effects of maltreatment on SR.

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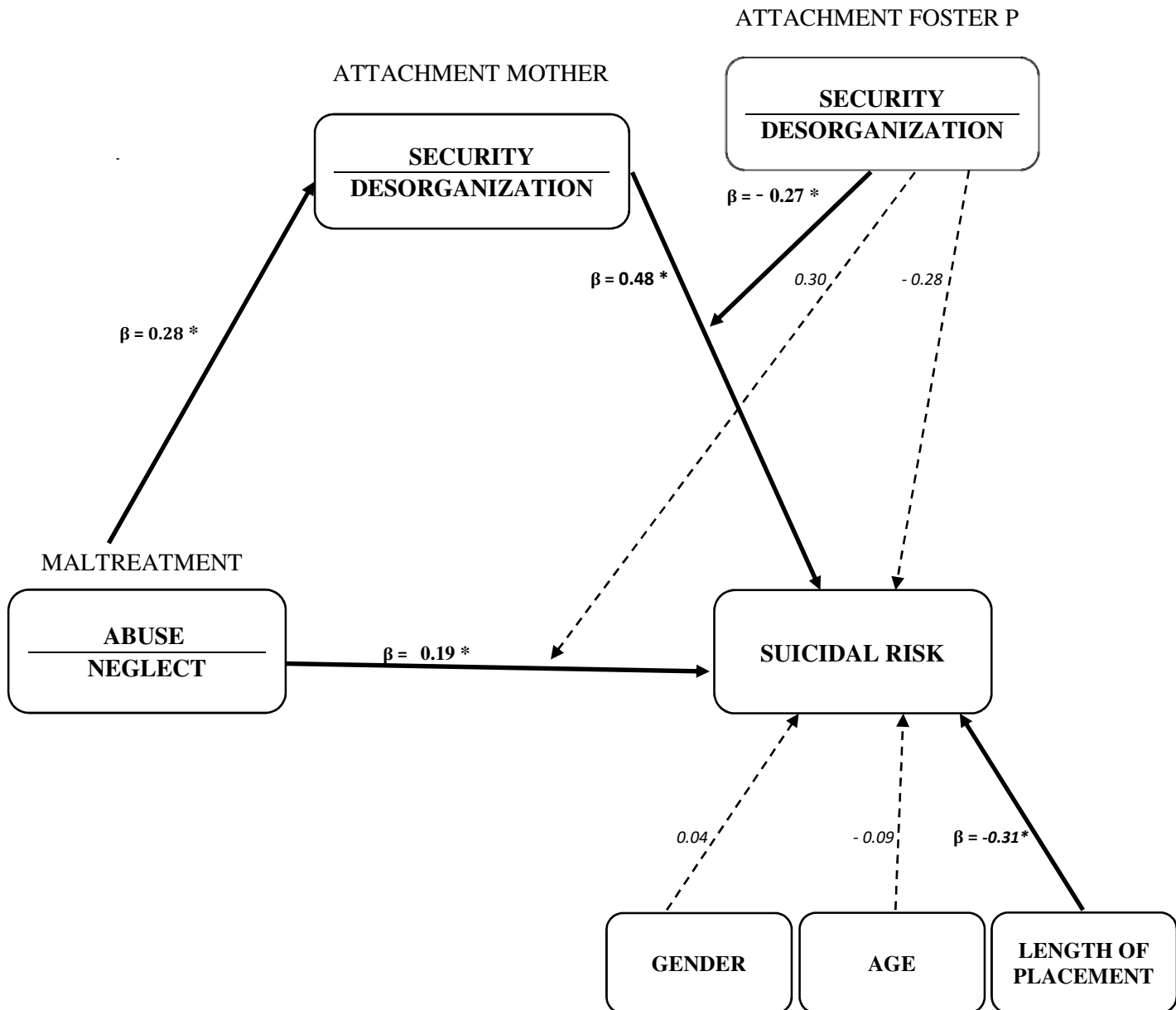
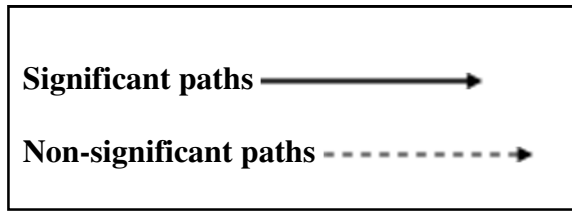
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Figure 1 PLS PM graph for suicidal risk in adult survivors of childhood maltreatment



*Foster P: Foster Parent

Table 1.

Descriptive statistics of scores of suicidal risk, maltreatment (Child Trauma Questionnaire), and attachment (Attachment Multiple Model Interview, length of placement, and of age (N=77)

Variable	Mean	SD	[Range]
Suicidal Risk	1.51	1.14	[0 - 3]
CTQ EA	22.3	4.26	[5 -25]
CTQ PA	17.3	6.04	[5 -25]
CTQ SA	16.3	7.92	[5 -25]
CTQ EN	8.44	5.86	[5 -25]
CTQ PN	17.6	7.00	[5 -25]
Security-mother	0.85	1.38	[0 - 6]
Deactivation-mother	6.12	1.91	[0 - 8]
Hyperactivation-mother	5.11	2.28	[0 - 8]
Disorganization-mother	9.48	4.57	[0 -16]
Security-father	0.21	0.41	[0 - 1]
Deactivation-father	6.64	1.66	[0 - 8]
Hyperactivation-father	4.07	2.35	[0 - 8]
Disorganization-father	7.67	4.72	[0-16]
Security-foster parent	3.18	1.09	[2 - 7]
Deactivation-foster parent	4.76	2.24	[0 - 8]
Hyperactivation- foster parent	3.38	2.31	[0 - 8]
Disorganization-foster parent	3.56	3.34	[0 - 8]
Lenght of placement	8.84	5.02	[2 - 21]
Age	26.9	8.06	[18-53]

Table 2.*Descriptive statistics for latent variables (LVs) and manifest variables (MVs)*

Latent variables (LVs)	Manifest variables (MVs)	Mean (SD)	R ²
Suicidal Risk	Suicidal Risk		0.57
Attachment-Mother	Security	0.64 (0.16)	
	Desorganization	0.95 (0.02)	
Attachment-Foster parent	Security	0.29 (0.15)	
	Desorganization	0.96 (0.04)	
Maltreatment	Sexual Abuse	0.65 (0.14)	
	Physical Abuse	0.45 (0.20)	
	Emotional Abuse	0.60 (0.15)	
	Physical Neglect	0.05 (0.27)	
	Emotional Neglect	0.27 (0.27)	
Interaction Mother * Foster parent	Security Mother		
	Desorganization Mother		
	Security Foster parent		
	Desorganization Foster parent		
Interaction Maltreatment * Foster parent	Sexual Abuse		
	Physical Abuse		
	Emotional Abuse		
	Physical Neglect		
	Emotional Neglect		
	Security Foster parent		
	Desorganization Foster parent		
Length of placement	Length of placement		
Gender	Gender		
Age	Age		

Table 3.*Unidimensionality test for latent variables (LVs) and manifest (MVs)*

Latent variables (LVs)	Manifest variables (MVs)	Unidimensionality
Suicidal Risk	Suicidal Risk	1
Attachment-Mother	Security Desorganization	0.83
Attachment-Foster parent	Security Desorganization	0.70
Maltreatment	Sexual Abuse Physical Abuse Emotional Abuse Physical Neglect Emotional Neglect	0.73
Interaction Mother * Foster parent	Security Mother Desorganization Mother Security Foster parent Desorganization Foster parent	0.90
Interaction Maltreatment * Foster parent	Sexual Abuse Physical Abuse Emotional Abuse Physical Neglect Emotional Neglect Security Foster parent Desorganization Foster parent	0.93
Length of placement	Length of placement	1
Gender	Gender	1
Age	Age	1

Table 4.*Direct and indirect bootstrapped path coefficients*

Latent variables (LVs)	β weight			95% bootstrap CI
Direct paths				
Maltreatment → Attachment-Mother	0.28			[0.12, 0.49] *
Attachment-Mother → SR	0.48			[0.24, 0.64] *
Attachment-Foster parent → SR	-0.28			[-0.59, 0.56]
Maltreatment → SR	0.19			[0.05, 0.41] *
Attachment FP * Attachment-Mother → SR	-0.27			[-0.75, -0.10] *
Attachment-FP * Maltreatment → SR	0.30			[-0.49, 0.32]
Length of placement → SR	-0.31			[-0.46, -0.10]
Gender → SR	0.04			[-0.16, 0.09]
Age → SR	-0.09			[-0.12, 0.13]
Direct and indirect paths				
Maltreatment → Att. Mother → SR	0.19	0.13	0.32	[0.12, 0.52] *

Note: CI: Confidence Interval; *: $p < .05$; Att.: Attachment, FP: Foster parent