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EMPIRICAL RESEARCH

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A Longitudinal Study of the Mediating Role of Romantic Attachment in the Relation Between Child Maltreatment and Psychological Adaptation in Emerging Adults

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Abstract
Considering the long-term deleterious consequences of child maltreatment, it is crucial to better understand the pathways leading to psychological outcomes in emerging adulthood. This study contributes to the existing knowledge through the examination of the role of romantic attachment as a mechanism explaining the association between child maltreatment and psychological adaptation. Prospective and retrospective data from 605 school-based participants (56.0% women) from the general population involved in a 10-year study were used. Child maltreatment, including sexual, physical, and emotional abuse, was measured at age 14 years (mean age = 14.04, SD = 0.21). Ten years later (mean age = 24.5, SD = 0.50), similar forms of maltreatment, in addition to neglect, were measured, along with adult romantic attachment, self-esteem, and psychological distress. The results of path analyses, controlling for self-esteem and psychological distress at age 14, revealed that child maltreatment was associated with increases in psychological distress and with decreases in self-esteem in emerging adults, through their levels of romantic attachment anxiety. The results also revealed that cross-sectional analyses involving retrospective measurements of child maltreatment at age 24 were as valuable as longitudinal analyses involving its measurement at age 14. Those results confirm the importance of romantic attachment in survivors' well-being, and suggest that attachment may be a key target for intervention with adolescents or emerging adults.

Keywords Child abuse · Cumulative Trauma · Self-esteem · Distress · Adolescents · Adults

Introduction

The transition between adolescence and emerging adulthood, which involves several changes, is a critical period in life (Arnett 2014). Adverse life events can affect adolescents' and emerging adults' ability to adapt well to this new phase in their lives (Cicchetti and Rogosch 2002). Child maltreatment is documented as an adverse life event that is linked to persistent negative physical and mental health outcomes in adulthood (Gilbert et al. 2009). In addition, a body of research indicates that many individuals experience more than one form of child maltreatment (e.g., Finkelhor et al. 2011), which increases negative outcomes in adulthood (Arata et al. 2005).

Although numerous adverse outcomes of child maltreatment have been documented in several studies, the ways that it impacts well-being in emerging adulthood remain poorly understood. Information is particularly limited on the potential pathways through which child maltreatment could influence psychological adaptation. In this regard, the theory of attachment, originally developed by Bowlby (1969), may shed light on how an individual might adapt in the aftermath of child maltreatment. Attachment refers to the mechanism by which a child internalizes a sense of attachment security (based on a sense of self-worth and confidence in significant others) in response to sensitive

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caregiving from attachment figures (e.g., the parents). Attachment figures who are reliable/sensitive promote secure attachment and those who are unreliable/insensitive promote attachment insecurity. Over time, these attachment experiences (i.e., interactions with figures of attachment) are integrated into relatively stable internal working models of self and others (Bowlby 1979) that color how people will form and maintain intimate relationships with others.

In late adolescence and in adulthood, attachment needs are increasingly met through an intimate partner (romantic attachment), who progressively becomes the main attachment figure (Hazan and Shaver 1987). In an extension of Bowlby's theory to adults, romantic attachment is conceptualized using two dimensions: attachment anxiety and attachment avoidance. Attachment anxiety involves a negative model of self, characterized by fear of relational rejection and abandonment, combined with a lack of self-worth (sense of unworthiness). It involves a strategic hyperactivation of the attachment system, that keeps the focus on signals of any relational threats and on the search for love and reassurance. Attachment avoidance reflects a negative model of others and is characterized by emotional suppression, self-reliance, and discomfort with closeness and interdependence, underlined by the expectation that the partner will be unavailable (Godbout et al. 2019). It involves a strategic deactivation of the attachment system to reduce negative emotional states as well as vulnerability to rejection and neediness (Mikulincer and Shaver 2007). Attachment security is characterized by low attachment anxiety and avoidance, whereas attachment insecurity is characterized by high attachment anxiety and avoidance.

Results of previous studies suggest that romantic attachment theory might constitute a useful framework to understand the pathways by which child maltreatment impacts well-being in emerging adulthood. First, previous work has demonstrated that child maltreatment is linked to romantic attachment insecurity in adulthood (Briere et al. 2017; Cohen et al. 2017; Godbout et al. 2009, 2017; Unger and DeLuca 2014). Second, attachment insecurity (both high attachment anxiety and high attachment avoidance) has been found to be associated with higher psychological distress in adulthood (Godbout et al. 2006, 2014, 2019). In this context, psychological distress is conceived as an intrapersonal proximal variable that reflects the effects of daily hassles and of pervasive vulnerabilities associated with past negative experiences.

Although the link between romantic attachment and self-esteem in emerging adulthood has not been studied, attachment insecurity in childhood has been linked to lower self-esteem in institutionalized children and adolescents (e.g., Suzuki and Tomoda 2015). This is in line with attachment theory, which suggests that, based on earlier social interactions involving reliable and sensitive attachment figures, positive feedback, and space to develop feelings of trust, people with more secure attachment will develop a positive self-concept and consider themselves worthy of love. In contrast, those with more insecure attachment, especially attachment anxiety, have typically grown up in unsupportive or unreliable environments and have internalized cognitive models of themselves as unlovable and unworthy, resulting in lower self-esteem (Mikulincer and Shaver 2012; Wu 2009).

Third, previous studies have shown that romantic attachment mediates the link between child maltreatment and psychological adaptation/symptoms among adults from the general population (Godbout et al. 2006, 2009, 2019) as well as among college/university students (Godbout et al. 2019; Hankin 2005; Limke et al. 2010; Muller et al. 2012; Roche et al. 1999; Sandberg et al. 2010). A three-year longitudinal study among adult women has also supported previous correlational studies showing that insecure attachment partially mediated the relationship between child maltreatment and anxiety and depression disorders (Bifulco et al. 2006). It should be noted that few of these previous research have conceptualized romantic attachment using two dimensions (attachment anxiety and attachment avoidance). For example, many have used composite measures of overall insecure attachment (Hankin 2005; Muller et al. 2012) or different attachment styles (Bifulco et al. 2006; Roche et al. 1999). In studies where both dimensions of romantic attachment were examined, results indicated that attachment anxiety, but not attachment avoidance, mediated the link between victimization and post-traumatic symptom (Sandberg et al. 2010), psychological well-being (Limke et al. 2010), and couple adjustment (Godbout et al. 2006, 2009). Furthermore, the majority of the above studies were cross-sectional. Moreover, whereas either one form (e.g., child sexual abuse) or multiple forms of child maltreatment (e.g., child sexual abuse and emotional abuse) were examined separately, the co-occurrence of multiple forms of child maltreatment was generally not investigated in relation to psychological distress. Finally, the mediating role of romantic attachment in the link between child maltreatment and self-esteem has not been investigated. Thus, very little is known about the mediating role of the two dimensions of romantic attachment in emerging adults' psychological adaptation (i.e., psychological distress and self-esteem) in the aftermath of child maltreatment. Considering that attachment anxiety is particularly altered in survivors of child maltreatment, whereas attachment avoidance may be less affected by child maltreatment (Godbout et al. 2006, 2017), examination of the impact of these two dimensions of insecure attachment on different outcomes might lead to a better understanding of the key factors that may reduce or prevent psychological adaptation. If optimal prevention strategies are to be designed for

adolescents and emerging adults, increased knowledge of mediating processes is crucial.

One of the methodological issues often reported in studies on the long-term consequences of child maltreatment is the use of cross-sectional designs and retrospective reports of child maltreatment. For example, adults' retrospective reports of child maltreatment may lead to recall biases or an inability to recall abuse (Hardt and Rutter 2004). Moreover, results of a recent meta-analysis revealed that agreement between prospective and retrospective measures of childhood maltreatment is low, independently of the type of prospective assessment measure used, age at retrospective report, sex, or study quality (Baldwin et al. 2019). The authors concluded that prospective and retrospective measures might identify two different groups of maltreated victims, whose risk pathways to adaptation may differ. As different measurement approaches can lead to inconsistent findings, comparative studies of prospective and retrospective measures of child maltreatment seem warranted to evaluate if the same underlying mechanisms can be identified. The present study will thus provide a unique contribution to the literature through the comparisons of child maltreatment reports at two different time points, one at age 14 and the other at age 24.

Lastly, post-trauma symptomatic trajectories may be experienced differently depending on gender (Godbout et al. 2009, 2019). For example, Godbout et al. (2019) found that attachment anxiety mediated the link between child maltreatment and psychological distress in male survivors, while both avoidant and anxiety attachment acted as mediators in women. Moreover, psychological distress and low self-esteem tend to be higher among women as compared to men (Matud et al. 2015; Orth and Robins 2014; Watkins and Johnson 2018), but men tend to report higher attachment avoidance while women tend to report higher attachment anxiety (Del Giudice 2011). Nonetheless, previous studies also revealed that sex differences are small or reported gender invariance of integrative model of the effects of child maltreatment (similar paths in men and women) (e.g., Godbout et al. 2019). Together, previous findings highlight the need to examine gender invariance in models depicting the effects of child maltreatment on psychological adaptation of emerging adults.

The Current Study

Even though it is now generally recognized that child maltreatment leads to long-lasting negative outcomes, there is limited knowledge of how it contributes to emerging adults' psychological adaptation. In this longitudinal study, the main objective was to examine the role of romantic attachment in the link between the co-occurrence of various forms of child maltreatment and psychological adaptation in a multivariate mediational model. Based on previous work, it was expected that child maltreatment would be related to lower self-esteem and higher psychological distress. It was also suggested, based on the attachment theoretical framework, that attachment anxiety would act as a mediator in these relationships. Given mixed findings regarding child maltreatment assessment using prospective and retrospective data, another objective was to compare two models, one using longitudinal data, that is, child maltreatment measured at 14 years, with a model using cross-sectional data, that is, child maltreatment measured at 24 years. Finally, given potential sex differences in psychological adaptation, gender invariance was examined. The hypothesis was that men would have higher self-esteem and lower psychological distress, but that the integrative model would be invariant across gender.

Method

Participants

In 2002, a sample of 1400 students aged 14 years was randomly selected from the 3546 students attending public and private high schools in the Saguenay–Lac-Saint-Jean region, a geographically isolated and homogeneous Canadian population. Among those randomly selected, a representative sample of 1176 students completed a questionnaire (non-participation was related mainly to school absences). From that sample, 605 participants were authorized by their parents to participate in the longitudinal study, which involved five waves of data collection. Statistical analyses were performed to compare the 605 participants in the longitudinal study with the 571 who had dropped out after the baseline assessment. The results indicated that participants were more likely than dropouts to be girls (55.6 vs. 45.3%) and to have parents with a post-secondary degree (67.5 vs. 53.0%). No difference was found between participants and dropouts in terms of perceived economic conditions, psychological distress, or self-esteem (Veillette et al. 2007).

The data used in this study were collected in 2002 and 2012. Of the 605 participants (338 girls and 266 boys, and one missing value for gender), 370 (240 women and 130 men; 61.3%) completed the questionnaires after 10 years (T2), at age 24. Among the participants, 10.5% at 14 years and 17.4% at 24 years reported experiencing food insecurity (e.g., could not afford to eat balanced meals), an indicator of low socioeconomic status (Anderson 1990; Nord and Prell 2007). At 24, the majority were working only (63.0%), 10.3% were studying only, 21.1% were both working and studying, and 2.7% were neither working nor studying.

Moreover, 29.5% had a high school diploma, 35.7% a general and vocational college degree, and 30.5% a university degree (4.3% had not finished high school). Finally, 80.4% of the participants were in an intimate relationship. Attrition analyses indicated that gender (being male) was associated with dropout at 24 years of age. No significant differences were found for child maltreatment, having a parent with a postsecondary degree, or food insecurity.

Procedures

At T1 (at 14 years), all participants completed a self-administered questionnaire at school. The questionnaire included measures of child maltreatment, psychological distress, and self-esteem. About ten years later (at age 24), the majority (94.3%) of the participants completed the questionnaire online, while the others completed it on paper and returned it by mail. Measures included at T2 were child maltreatment, romantic attachment, psychological distress, and self-esteem. This study was approved by the institutional review board (IRB) of the Université du Québec à Chicoutimi, the Cégep de Jonquière and the Institut national de la santé publique du Québec. Informed consent was obtained from all participants included in this study at T1 and T2, as well as from their parents at T1 (when participants were 14 years of age).

Measures

Sociodemographic information was collected at T1 and T2 (e.g., age, sex, employment status, diploma, if they were in a couple relationship at T2 [80.2% of the sample]).

Child maltreatment

A composite metric score was created for child maltreatment at T1 and T2, wherein a set of dichotomous child maltreatment exposures (exposure = 1; no exposure = 0) were summed together. This approach was used because it reduces measurement error, enhances validity, reduces collinearity, leads to more stable estimates, and increases statistical power (see Evans et al. 2013). This method was used for assessment at T1 and T2.

Child maltreatment measured at T1 (prospective) When the participants were 14 years old, physical abuse was measured using two items assessing experiences of being pushed, slapped, or shoved, or being beaten violently over the last twelve months by a parent (Deschesnes et al. 1997). An affirmative answer to at least one of these two items was scored as having experienced physical abuse (8.5% of the sample). Exposure to (witnessing) inter-parental psychological violence, for which 8.1% of the sample gave an affirmative answer, was measured with the following item: Your parents yell or insult each other "often" or "very often" (Deschesnes et al. 1997). Endorsement of an item measuring forced sexual encounters was scored as child sexual abuse (4.2%). Finally, the child maltreatment composite variable was created by summing up the presence of those three forms of maltreatment. Potential scores were 0 (no maltreatment = 83.9%), 1 (one of the three forms = 12.6%), 2 (two of the three forms = 2.8%), or 3 (all three forms = 0.7%). It should be noted that these three measures were the only ones available at T1 for child maltreatment.

Child maltreatment measured at T2 (retrospective) Child maltreatment prior to age 18 was also measured retrospectively at age 24, using a broader measure to capture more forms of child maltreatment. This measure was used to compare the integrative, prospective data model with a cross-sectional data model. Child physical abuse (affirmative response from 9.7% of the sample) was assessed with two items: receiving a spanking "often" or "very often," or being hit harder than a spanking at least once by a parent (Clément et al. 2000; Tourigny et al. 2008). Child emotional abuse (13.8% of the sample) was considered present if a positive response was given for at least one of the following two items: being threatened, humiliated, or ridiculed by a parent, or having witnessed inter-parental physical violence in childhood (Clément et al. 2000; Tourigny et al. 2008). Child sexual abuse (8.6%) was measured with two items: unwanted sexual touching by an adult or a child three years older than the respondent and unwanted sexual intercourse (Tourigny et al. 2008). Child neglect was measured using an adaptation of two items from the Comprehensive Child Maltreatment Scale for Adults (Higgins and McCabe 2001): parents not providing basic child needs (meals, baths, clothing, or medical care), and ignoring requests for attention or not speaking to the child for a long period (11.0% of the sample). The child maltreatment composite variable was also computed by summing up the presence of those four forms of maltreatment. Possible scores were 0 (no maltreatment = 70.7%), 1 (one of the four forms = 19.6%), 2 (two of the four forms 6.4%), 3 (three of the four forms = 2.5%), and 4 (all four forms = 0.8%).

Self-esteem at T1 and T2

The French version of the 10-item Rosenberg Self-Esteem Scale (Rosenberg 1965; Vallières and Vallerand 1990) was used to assess self-esteem at T1 and T2. The scale is rated on a four-point Likert scale with responses ranging from strongly disagree (1) to strongly agree (4). The overall self-esteem scores vary from 10 to 40, a high score reflecting a high level of self-esteem. The satisfactory psychometric qualities found in previous studies (Vallières and Vallerand

1990) were also found in the current sample ($\alpha = 0.85$ and 0.86 at T1 and T2 respectively).

Psychological distress at T1 and T2

Psychological distress was measured at T1 and T2 using the Indice de détresse psychologique de l'enquête Santé Québec (IDPSQ-14; Préville et al. 1992). This measure, an adaptation of the Psychiatric Symptom Index (Ilfeld 1976), includes items relating to symptoms of anxiety, depression, aggressiveness, and cognitive impairment. Symptom intensity is rated on a four-point Likert scale, ranging from never (1) to very often (4). Scores ranging between 14 and 56 are converted into scores from 0 to 100 by linear transformation. The IDPSQ-14 has good internal consistency and construct validity (Préville et al. 1992). Reliability in this sample was high ($\alpha = 0.88$ and 0.91 at T1 and T2 respectively).

Attachment at T2

The French version of the 12-item Short Form of the Experiences in Close Relationships Questionnaire (ECR-12; Brennan et al. 1998; Lafontaine et al. 2016) was used to assess two dimensions of romantic attachment: attachment anxiety and attachment avoidance at T2. Participants indicate their level of agreement with each item on a seven-point Likert scale ranging from strongly disagree (1) to strongly agree (7). Higher mean scores indicate higher anxiety and avoidance. The psychometric properties of the ECR-12 have been recently demonstrated, and results indicate that it is as good as the original ECR and superior to other existing short forms (Lafontaine et al. 2016). In this study, the alpha coefficients were high (attachment anxiety = 0.89; attachment avoidance = 0.87).

Statistical Analyses

Descriptive analyses were conducted to examine the distribution of child maltreatment within the sample, and correlations and ANOVAS were performed to assess the association between study variables. The hypothesized model was tested using path analyses with child maltreatment as the exogenous variable, attachment anxiety and avoidance as potential mediators, and self-esteem and psychological distress as the outcomes or endogenous variables. Path analysis is a statistical method that allows simultaneous testing of both direct and indirect associations among different variables (Kline 2011). It also estimates covariation among variables, considering all paths simultaneously. Analyses were conducted with *Mplus*, version 7, using the robust method, correcting for the expected non-normal distributions (Muthén and Muthén 1998–2012). This program accounts for missing data using the *full information maximum likelihood estimation method* (FIML; Muthén and Muthén 1998–2012). Between-gender differences were tested using a multiple group analysis in *Mplus* (Muthén and Muthén 1998–2012).

Adequacy of model fit was assessed through several indices: the chi-square statistic, the comparative fit index (CFI; Bentler 1990), and the root mean square error of approximation (RMSEA; Steiger 1990). A non-significant chi-square value, a CFI value of 0.90 or higher, and a RMSEA value below 0.06 are considered indicators of good fit (Hu and Bentler 1999), with a RMSEA 90% confidence interval ranging from 0 to 0.08 indicating good accuracy in assessing model fit. Since chi-square tests are sensitive to sample size (Kline 2011), the ratio of chi-square to degrees of freedom (X^2/df) was used. Values less than 5 indicate a satisfactory fit, but a more conservative cut-off value of 3 is ideal (Ullman 2001).

To examine the significance of indirect effects, 95% bootstrap confidence intervals were used (MacKinnon and Fairchild 2009). This bias-corrected method is based on a distribution of the product of coefficients and generates confidence limits for the true value of the coefficient for indirect effects. When zero is not in the confidence interval, the indirect effect is considered significant.

To evaluate the gender moderation hypothesis for the mediational model, a multiple-group gender-invariance path analysis was conducted using a chi-square difference test, where a univariate incremental chi-square value probability smaller than 0.05 indicates evidence of differences across men and women.

Results

Descriptive Results

At age 14 years, 20.1% of the girls and 10.5% of the boys reported being victims of at least one of the three forms of child maltreatment measured, $\chi^2 = 10.24$, $p = 0.001$. At age 24, 31.4% of the women and 25.2% of the men reported being victims of at least one of the four forms of child maltreatment measured, $\chi^2 = 1.50$, $p = 0.221$. Table 1 presents each exposure type by gender.

Results of ANOVAS revealed that, compared with boys, girls had slightly higher levels of psychological distress at age 14, F (1, 601) = 28.30, $p < 0.001$, $\eta^2 = 0.045$, lower levels of self-esteem at age 14, F (1, 603) = 23.02, $p < 0.001$, $\eta^2 = 0.037$, and at age 24, F (1, 364) = 4.03, $p = 0.046$, $\eta^2 = 0.011$, as well as lower levels of attachment avoidance at age 24, F (1, 351) = 4.55, $p = 0.034$, $\eta^2 = 0.013$. The results indicated no differences in levels of psychological distress at age 24, F (1, 364) = 0.47, $p = 0.492$, or of attachment anxiety, F (1, 351) = 2.44, $p =$

0.119, between boys and girls. The means, standard deviations, and correlation coefficients for the analyzed variables are also presented in Table 2.

Other socio-demographic variables were also tested (i.e., age, being in a relationship, diploma). As none of these variables were associated with the psychological adaptation outcomes (self-esteem and psychological distress), they were not included as covariables in the integrative model.

Integrative Model using Adolescent Reports of Child Maltreatment

Path analyses were first performed on the mediational model, while controlling for outcomes at T1 (i.e., psychological distress and self-esteem at T1). Fit indices indicated that the specified model was a good representation of the data, $\chi^2(8) = 15.45$, $\chi^2/df = 1.93$, $p = 0.05$; RMSEA = 0.04 95%CI (0.00–0.07); CFI = 0.97 (covariances were all included). Figure 1 presents the standardized coefficients for the path analysis, which indicate that child maltreatment experienced at age 14 was positively and significantly associated with attachment anxiety. In turn, attachment anxiety significantly predicted less self-esteem and more psychological distress at age 24. However, child maltreatment was not significantly associated with attachment avoidance. Child maltreatment measured at 14 was not directly associated with less self-esteem or more psychological distress at 24. Thus, child maltreatment measured at 14 was found to affect the outcome variables indirectly through attachment anxiety, indicating a mediation effect. As expected, the covariance between attachment anxiety and avoidance was significant ($\beta = 0.19$, $p < 0.001$), as was the covariance between self-esteem and psychological distress ($\beta = -0.41$, $p < 0.001$). Self-esteem at age 14 was significantly associated with self-esteem at age 24, and the same relationship was found for psychological distress. Overall, the model accounted for 28% of the variance for self-esteem and 16% of the variance for psychological distress.

Tests of indirect effects revealed that the product coefficient for the path from child maltreatment to psychological

Table 1 Frequency of exposure to child maltreatment type by gender

	Women	Men	χ^2
Forced intercourse before 14	7.2%	0.4%	16.56***
Witnessed inter-parental violence before 14	11.3%	3.8%	10.18**
Physical abuse before 14	9.5%	7.2%	0.99
Sexual abuse before 18	11.7%	4.9%	3.35^t
Psychological abuse before 18	11.0%	2.8%	5.05*
Physical abuse before 18	10.0%	8.9%	0.112
Neglect before 18	12.1%	8.9%	0.841

*$p < 0.05$; **$p < 0.01$, ***$p < 0.001$, $^t p < 0.10$

Table 2 Correlation coefficients, means, and standard deviations for study variables

Variables	M (SD)	1	2	3	4	5
1. CM at 14	0.20 (0.51)	–				
2. CM at 24	0.43 (0.79)	0.291***	–			
3. Attachment anxiety	3.28 (1.43)	0.141**	0.144**	–		
4. Attachment avoidance	2.21 (1.09)	0.010	−0.018	0.191***	–	
5. Self-esteem at 24	33.74 (4.49)	−0.203***	−0.186***	−0.382***	−0.272**	–
6. Psychological distress at 24	20.27 (16.33)	0.174**	0.235***	0.340***	0.077	−0.494***

CM = reported at least one type of child maltreatment.

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

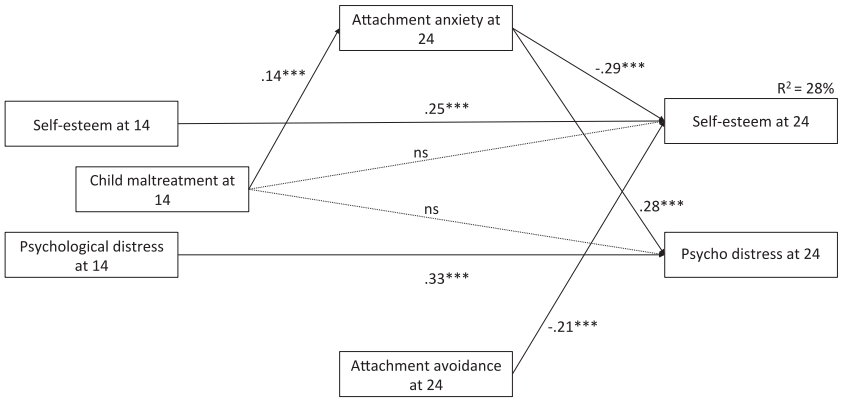

Fig. 1 Path analysis model including child maltreatment, romantic attachment, self-esteem, and psychological distress. Note: standardized coefficients are presented in Fig. 1. *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

distress, through attachment anxiety, was significant ($b = 1.26$, 95% bootstrap IC = 0.45–2.38). The proportion of the total effect of child maltreatment explaining psychological distress through attachment anxiety was 38%. Moreover, the path from child maltreatment to self-esteem through attachment anxiety was also significant ($b = -0.35$, 95% bootstrap IC = −0.63 to −0.13), supporting the mediational role of attachment anxiety. The proportion of the total effect of child maltreatment going through attachment anxiety to explain self-esteem was 34%.

Gender invariance

The path analysis model was first assessed simultaneously for women and men, allowing all paths to be estimated freely, to ensure that the model held for both genders. The results revealed a good-fitting multigender model: $\chi^2(14) = 19.42$, $X^2/df = 1.39$, $p = 0.15$; RMSEA = 0.04, 90% IC (0.00–0.07); CFI = 0.98. This model was then compared with a more restrictive one in which all coefficient regression paths were constrained to be equal across men and women. The results indicated a non-significant chi-square difference between the freely estimated model and the one with constrained regression coefficient paths ($\Delta\chi^2(9) = 2.02$, $p = 0.991$). Next, a comparison was made with another more restrictive model, in which equality constraints were also made on covariances of the model in both men and women. The results showed a significant chi-square difference ($\Delta\chi^2(12) = 57.76$, $p = 0.000$), indicating that the model was not invariant between men and women. The Wald test was performed to identify gender differences and revealed two differences: there was greater variability in women's responses on child maltreatment and in psychological distress at T1 than in men's, although results of overall invariance analyses suggested that the model was gender-invariant.

Integrative Model using Adult Retrospective Reports of Child Maltreatment

The model was re-estimated to verify if it held using a retrospective measure of child maltreatment at age 24, instead of the longitudinal measurement at age 14. The results showed that a model using a variable including four types of maltreatment provided a good representation of the data, $\chi^2(1) = 0.27$, $\chi^2/df = 0.14$, $p = 0.87$; RMSEA = 0.00 95% IC (0.00–0.10); CFI = 1.00; (all covariances were included and significant), with similar significant coefficient paths and explained variances. As in the prospective model, child maltreatment measured at age 24 was significantly associated with attachment anxiety ($\beta = 0.15$, $p < 0.01$), but not with attachment avoidance. Moreover, attachment anxiety was significantly associated with less self-esteem and more psychological distress, $\beta = -0.32$, $p < 0.001$ and $\beta = 0.31$ $p < 0.001$, respectively. Attachment avoidance was related only to lower self-esteem, $\beta = -0.21$, $p < 0.001$. Child maltreatment measured at 24 was still significantly associated with less self-esteem and more psychological distress, $\beta = -0.14$, $p < 0.01$ and $\beta = 0.19$ $p < 0.05$, respectively. Thus, child maltreatment measured at 24 was found to affect the outcome variables directly, as well as indirectly through attachment anxiety, indicating partial mediation. Overall, the model accounted for 21% of the variance for self-esteem and 15% of the variance for psychological distress.

Sensitivity Analyses

To ensure the theoretical validity of our composite child maltreatment scores, the correlations between the study variables and each child maltreatment form were examined separately. Similar patterns of results were observed. Moreover, the robustness of the integrated models was checked by verifying if the same results were obtained using multivariate regressions. The results were similar to those presented. Path analyses were selected instead of regressions because they have been found to provide more rigorous parameter estimates and FIML can be used for missing data. These results are available upon request.

Discussion

While several correlational studies have been conducted on the negative impacts of victimization, there has been little exploration of the extent to which child maltreatment prospectively affects psychological outcomes over time while controlling for those outcomes at a previous measurement time. Moreover, the role of attachment in the link uniting child maltreatment and psychological adaptation in emerging adults, in terms of self-esteem and psychological distress, had not been investigated previously. Therefore, the main goal of this study was to gain a better understanding of the mechanisms that explain long-lasting deleterious consequences of child maltreatment. This large-scale longitudinal study, in which the attachment theory framework was used, provides further knowledge through the investigation of the mediating role of romantic attachment in the relationship between child maltreatment measured at ages 14 and 24 years and psychological adaptation in emerging adulthood. These two measurement points made it possible to compare potentially different groups of victims to verify if the same pathways could be identified in an integrative model of the links between child maltreatment, attachment, self-esteem and psychological distress. Overall, the results indicated that attachment anxiety act as mediator of the link

uniting child maltreatment and subsequent psychological adaptation (i.e., self-esteem and psychological distress).

Compared with non-victims, victims of child maltreatment in this study reported more psychological distress and less self-esteem. These results confirm those of previous studies where child maltreatment survivors were found to present higher levels of psychological symptoms or difficulties and lower levels of self-esteem compared with adults who did not suffer child maltreatment (Barbosa Pachecho et al. 2015; Herrenkohl et al. 2012). As expected, the results of the integrated model revealed that the associations between child maltreatment and psychological distress and self-esteem were mediated by attachment, but only through attachment anxiety. In other words, a higher level of child maltreatment was associated with an increase in psychological distress and a decrease in self-esteem through its relation with attachment anxiety. This integrative model also held when two different types of data (longitudinal and cross-sectional) were used. These results found in a community sample confirm those of previous studies showing the mediating role of attachment anxiety in the effect of various child maltreatment forms on psychological adaptation/symptoms among university students (Limke et al. 2010; Muller et al. 2012; Sandberg et al. 2010).

Having been a victim of maltreatment may reinforce the child's view that he/she is worthless and underserving of love, which would then lead to the development of concerns about love and worries about abandonment (Godbout and Briere 2012). This was the first study involving the development of an integrative model of the mediating role of attachment in the relationships between child maltreatment and self-esteem as well as psychological distress among emerging adults from the general population. Nonetheless, the current results parallel those from other studies, which showed that various forms of child maltreatment (although the accumulation of different forms was not studied) were related to attachment anxiety in adulthood (Cohen et al. 2017; Godbout et al. 2009; Unger and DeLuca 2014). In turn, attachment anxiety was associated with higher levels of psychological distress and lower levels of self-esteem, as observed in previous studies on self-esteem (Suzuki and Tomoda 2015), psychological distress (Godbout et al. 2006, 2009), and psychological adjustment (Limke et al. 2010).

Although child maltreatment was related to attachment anxiety, it was not related to attachment avoidance. This finding is consistent with those from some studies that examined various forms of child maltreatment but not the effect of cumulative trauma (Godbout et al. 2006, 2017, 2009; Limke et al. 2010; Sandberg et al. 2010), whereas it differs from others on the same subject (Briere et al. 2012; Godbout et al. 2019; Limke et al. 2010; Oshri et al. 2015). In a study conducted among college students, although those having suffered both emotional and sexual abuse before age 15 reported higher levels of attachment avoidance, only attachment anxiety mediated the link between maltreatment and psychological adaptation (Limke et al. 2010). Results from Sandberg et al. (2010) also showed the partial mediating effect of attachment anxiety, but not of attachment avoidance, between intimate partner violence and posttraumatic stress and between adolescent or adult sexual victimization and posttraumatic stress among college women. The current results may suggest a tendency towards self-blame in survivors. Moreover, the lack of association between attachment avoidance and psychological distress may be understood as a tendency to avoid or keep a protective distance from internal feelings, which is related to less connection with psychological distress or denial (Fraley and Shaver 1997; Mikulincer and Orbach 1995).

The fact that the relation between child maltreatment and psychological adaptation did not vary as a function of gender shows the importance of the role of attachment anxiety for both genders in the trajectory from child maltreatment to psychological adaptation. Nonetheless, these results revealed more variability of child maltreatment and psychological distress at T1 in the model for women's responses, compared with the one for men's responses. This result could be explained by the fact that this sample of women had experienced more child maltreatment, had higher levels of psychological distress at T1 and had lower levels of self-esteem at T1 and T2.

The current results show that the integrative mediation model using adult retrospective reports of child maltreatment was similar to the one including longitudinal measurements. These findings are of particular interest, because they show that the model held for both prospective (longitudinal) and retrospective (cross-sectional) measures of child maltreatment. To strengthen these results, this study should be replicated in future research, but with the same measure of child maltreatment at each measurement wave. Report agreement could thus be measured given concerns of recall bias (Baldwin et al. 2019).

Although similar to those in another study conducted among children and adolescents (Finkelhor et al. 2014), the rates of child maltreatment found in this study at age 14 years were considerably lower than in other studies where child maltreatment was measured prior to age 18 (e.g., Afifi et al. 2014; Bigras et al. 2017), possibly because of the conservative measures used. For example, while this type of measurement is common (Barth et al. 2013), only forced intercourse was assessed for child sexual abuse, whereas non-contact child sexual abuse, such as exhibitionism, and sexual contacts, such as kissing and oral sex, also constitute child sexual abuse (Leeb et al. 2008; Vaillancourt-Morel et al. 2015). Despite the fact that these measures of child

maltreatment were broader at 24 years and that it may be common practice to use fewer items to measure child maltreatment, more representative results might have been obtained with detailed measures of child maltreatment, especially given the current consensus that multiple forms of child maltreatment often co-occur (Afifi et al. 2014, Bigras et al. 2017) and the gender differences in the types experienced. Moreover, expanding the number of traumatic events measured could be relevant because bullying seems to have repercussions that are as deleterious, if not more, than adult-perpetrated abuse (Lereya et al. 2015) and childhood neglect also has been shown to have long-lasting effects, on self-esteem and psychological symptoms (Arata et al. 2005; Leeb et al. 2011). Nevertheless, multiple forms of child maltreatment were assessed and it seems that, for research purposes involving the development of models, dichotomized items might provide as much information as a more complete measure of child maltreatment (Godbout et al. 2009).

Despite these measurement issues and sample biases, a major strength of this research is the longitudinal design used, combined with a robust and appropriate statistical technique (path analysis), to investigate a model intended to explain links between child maltreatment and subsequent well-being rather than just showing a direct association. Furthermore, although mediation tests at one or two time points may result in biased parameter estimates (Maxwell and Cole 2007), they can still advance knowledge, especially when analyses are based on well-founded theories (Shrout 2011), in this case, the attachment framework. Psychological adaptation at T1 was also controlled for in the longitudinal model. Other strengths of this study include the use of a large-scale community sample instead of clinical or specialized samples, and the evaluation of the long-term effect (over 10 years) of child maltreatment on romantic attachment and psychological adaptation, where well-being is considered in addition to symptoms. Nonetheless, further studies should be conducted to replicate the findings among clinical populations or samples of child and adolescent maltreatment survivors, to increase the generalizability of these findings. Moreover, in future research, other mediators should be investigated to provide a better understanding of the pathways from child maltreatment to lower levels of psychological adaptation in emerging adulthood.

Conclusion

Although child maltreatment has been the topic of many studies, knowledge on mechanisms explaining its impact on well-being in emerging adulthood is limited. The aim of this study was to investigate the mediating role of romantic attachment in the associations between child maltreatment and psychological adaptation in emerging adulthood, while controlling for prior adaptation during adolescence. The results not only replicate associations already found in the literature (e.g., child maltreatment was related to psychological adaptation), but also help to further understand the long-term effects of the co-occurrence of multiple forms of child maltreatment by identifying a key process (i.e., through attachment anxiety) that explains lower psychological adaptation in emerging adulthood. The mediating role of adult romantic attachment opens the door to practical implications. Indeed, the fact that attachment may play a role in recovery highlights the importance of targeting attachment anxiety among child maltreatment survivors (see for e.g., Johnson 2002; MacIntosh and Johnson 2008) and of promoting secure attachment in maltreated emerging adults (Hughes 2004). Moreover, considering the long-term negative consequences of child maltreatment, policy-making decisions should focus on minimizing children's exposure to maltreatment. A plethora of factors can affect how emerging adults adapt and evolve. The transition from adolescence to adulthood thus remains a critical period of life that needs to be studied even further.

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Authors' Contributions JD conceived of the study, participated in its design and coordination and drafted the manuscript; JG participated in the design of the study and also drafted the manuscript with JD; NB performed the statistical analysis and participated in the interpretation of the data; MEB participated in the conception of the study, in its design and the interpretation of the data; NG helped to draft the manuscript and participated in the interpretation of the data. All authors read and approved the final manuscript.

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Data Sharing and Declaration The data that support the findings of this study are available from the first and last authors. However, restrictions apply to the availability of these data, which were used under license for the current study and are therefore not publicly available. However, data are available from the authors upon reasonable request and with permission from the first author.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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