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Childhood maltreatment and adulthood victimization: An evidence-based model

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ABSTRACT

There is ample evidence showing that childhood maltreatment increases two to three fold the risk of victimization in adulthood. Various risk factors, including posttraumatic stress disorder (PTSD) symptoms, dissociation, self-blame, and alcohol abuse are related to revictimization. Although previous research examined associations between risk factors for revictimization, the evidence is limited and the proposed models mostly include a handful of risk factors. Therefore, it is critical to investigate a more comprehensive model explaining the link between childhood maltreatment and adulthood (re)victimization. Accordingly, this study tested a data-driven theoretical path model consisting of 33 variables (and their associations) that could potentially enhance understanding of factors explaining revictimization. Cross-sectional data derived from a multi-wave study were used for this investigation. Participants ($N = 2156$, age $_{mean} = 19.94$, $SD = 2.89$) were first-year female psychology students in the Netherlands and New Zealand, who responded to a battery of questionnaires and performed two computer tasks. The path model created by structural equation modelling using modification indices showed that peritraumatic dissociation, PTSD symptoms, trauma load, loneliness, and drug use were important mediators. Attachment styles, maladaptive schemas, meaning in life, and sex motives connected childhood maltreatment to adulthood victimization via other factors (i.e., PTSD symptoms, risky sex behavior, loneliness, emotion dysregulation, and sex motives). The model indicated that childhood maltreatment was associated with cognitive patterns (e.g., anxious attachment style), which in turn were associated with emotional factors (e.g., emotion dysregulation), and then with behavioral factors (e.g., risky sex behavior) resulting in revictimization. The findings of the study should be interpreted in the light of the limitations. In particular, the cross-sectional design of the study hinders us from ascertaining that the mediators preceded the outcome variable.

1. Childhood maltreatment and adulthood victimization: An evidence-based model

Childhood maltreatment (CM) is a common worldwide problem defined as abuse (emotional, psychical, and sexual), neglect (emotional and physical) or other exploitations that harm children's survival, health, and development (World Health Organization [WHO], 2020). The rate of physical and/or emotional abuse is approximately three in four among children at the age of two to four (United Nations Children's Fund [UNICEF], 2017). A systematic review showed that the median prevalence of childhood sexual abuse in girls was between 9% in Asia and 28.8% in Australia. This rate was lower for boys ranging from 6.1% in Australia to 26.5% in South America (Moody et al., 2018). CM has adverse effects on mental and physical health in adulthood.

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Meta-analytic studies show that CM is related to higher levels of depression, anxiety, eating-related disorders, impulsivity, and suicidality (Angelakis et al., 2019; Gallo et al., 2018; Liu, 2019; Molendijk et al., 2017).

Further, a meta-analysis provided support in favor of greater rates of physical problems, such as obesity, among CM survivors compared to peers without such experiences (Danese and Tan, 2014). A systematic review showed high rates of cardiovascular diseases, ranging from 61.5% to 91.7%, across studies of people with CM (Basu et al., 2017). In addition, there is extensive evidence that CM increases the risk of interpersonal victimization (i.e., physical, emotional, and sexual abuse) in adulthood. For instance, previous studies reported that childhood sexual abuse increased the chance of adulthood sexual victimization by two-to three-fold (Arata, 2002; Jankowski et al., 2002; Van Bruggen et al., 2006; Walker et al., 2019, Walker and Wamser-Nanney, 2023), a phenomenon called *revictimization*, which is defined as victimization in two developmental stages (i.e., childhood and adulthood; Walker et al., 2019, 2022). Most previous studies focused on a specific form of victimization in childhood and adulthood i.e., sexual abuse. However, there is evidence that each form of childhood maltreatment increases the chance of victimization in adulthood independent of the specific type of (re)victimization. For instance, a prospective study showed that childhood sexual abuse not only increases the risk of sexual victimization in adulthood, but also elevates the risk of adulthood physical and emotional abuse (Frugaard Stroem et al., 2019). Therefore, in the present study, revictimization is defined as any form of maltreatment in childhood accompanied by any form of victimization in adulthood to have a more comprehensive definition of revictimization.

1.1. Theoretical accounts of revictimization

To explain the link between CM and adulthood victimization, psychodynamic theories propose that CM survivors unconsciously repeat past traumatic events to achieve control and mastery over past trauma, a phenomenon called *Repetition-Compulsion* (van der Kolk, 1989), which is a broad term that can reflect various processes (Sandberg et al., 1994). Other theories have tried to explain revictimization with more specific mechanisms. For instance, *Betrayal Trauma Theory* assumes that dissociative amnesia is the underlying mechanism of revictimization (Freyd et al., 2007). When a caregiver maltreats a child, the betrayal cannot be effectively processed with the assistance of avoiding interaction with the perpetrator as the child needs them for physical and mental survival. Therefore, dissociation, as an adaptive response in that context, may support the attachment between the child and caregiver. However, habitual dissociation lasting into adulthood might interfere with information processing, including the detection of danger cues in similar interpersonal situations, resulting in a higher risk of revictimization (Messman-Moore and Long, 2003). Betrayal Trauma Theory assumes that the lack of access to information from the past which is created by dissociation, compromises risk recognition in adulthood, which in turn gives rise to revictimization. However, another formulation posits that revictimized people might actively engage in risky situations, despite their awareness of the threatening cues, due to prioritizing other needs, such as regulating negative emotions (Miron, & Orcutt, 2014). Unlike these three formulations that focus solely on the victims without considering their (social) context, another hypothesis introduces two underlying mechanisms for revictimization that also consider the impact of the victim's behaviors on potential perpetrators. As a first mechanism, victim's *increased vulnerability* due to psychological factors, such as posttraumatic stress disorder (PTSD) symptoms, might interfere with risk recognition and/or reaction to risk, and signal vulnerability to potential perpetrators. The second mechanism, *exposure to risk,* consists of factors increasing the chance of contact with perpetrators, such as engagement in intoxicated sex (Messman-Moore and Long, 2003).

1.2. Empirical evidence of pathways to revictimization

Available evidence partially supports several aspects of the above-mentioned theories. For example, people with high betrayal trauma (i.e., perpetrated by someone close) in childhood reported higher dissociation than people who did not experience high betrayal trauma during childhood (Gobin and Freyd, 2009). In turn, dissociation (Hébert et al., 2021; Messman-Moore and Long, 2003) and PTSD diagnosis/or symptoms (Cividanes et al., 2019) are related to revictimization, which is in line with the assumption of increased vulnerability. Relatedly, revictimization is associated with partner selection such that revictimized women rated partner's characteristics of sincerity and trustworthiness as less desirable compared to non-revictimized women (Gobin, 2012), which might increase the chance of exposure to abusive partners. Although these psychological factors are tested in isolation in most studies, recent studies have started to examine the relations between several risk factors. For instance, a study investigated associations between several risk factors in a pathway model, in which childhood sexual abuse was related to self-blame, which in turn was associated with alcohol-facilitated sexual victimization in adulthood through alcohol use (Mokma et al., 2016). In a study by Miron and Orcutt (2014), childhood sexual abuse was associated with adolescence sexual victimization, and then with depression, which in turn was related to using sexual interactions to reduce negative emotions, and then to the likelihood of sex with strangers, which prospectively predicted adulthood sexual victimization. These studies show the importance of testing the interrelations between risk factors of revictimization.

Inconsistent findings related to risk factors might be due to the majority of studies testing only one risk factor in isolation, and not in the context of other factors (Hébert et al., 2021). For instance, alcohol consumption at home might not expose people to the risk of victimization, while it might increase the risk if it occurs in the context of other factors, such as sexual interactions with strangers (Messman-Moore and Long, 2003). Thus, focusing on the simultaneous presence of multiple risk factors seems crucial for understanding revictimization. In addition, accounting for multiple proposed risk factors provides a chance to detect redundancy and ultimately arrive at a more parsimonious, yet comprehensive model. The complexity of models tested so far is limited to the inclusion of a handful of risk factors (Fortier et al., 2009; Messman-Moore et al., 2010; Orcutt et al., 2005; Ullman and Vasquez, 2015). Many proposed risk factors and relations between them are missing from these models. In addition, the comprehensive models tested so far (Fortier et al., 2009; Messman-Moore et al., 2010; Orcutt et al., 2005; Ullman and Vasquez, 2015) fail to include important intrapersonal risk factors, such as attachment styles and early maladaptive schemas, even though other studies supported their effects on revictimization in isolation (Celsi et al., 2021; Crawford and Wright, 2007; Hocking et al., 2016).

In sum, more comprehensive models are needed that consider interrelations between risk factors in order to develop evidence-based theories for revictimization, particularly for intrapersonal factors potentially malleable to change and, thus, proper as targets for interventions. To reach this aim, we built a comprehensive pathway model that consists of a series of candidate mediators between childhood maltreatment and adulthood victimization, that are suggested by available data and theories while also taking the relations between the various mediators into account. To this end, we employed exploratory structural equation modelling (SEM). We addressed two research questions: a) what mediators and their associations explain the relationship between CM and victimization in adulthood? and b) which mediators and relations between mediators show the strongest associations with revictimization?

2. Method

2.1. Procedure and design

The data were collected as a part of a multi-wave, multi-session study (four sessions within an academic year) running from 2017 to 2021. The sample consisted of first-year female psychology students (>16 years of age) from the Universities of Groningen, Amsterdam, Utrecht, Leiden, and Maastricht in the Netherlands, and Canterbury in New Zealand. Due to the Covid-19 pandemic, the data were collected using three methods: online, in lab, and hybrid. After providing informed consent, the participants responded to a battery of questionnaires in each session. After finishing each session, participants were debriefed about the study's research questions and provided with contact addresses for psychological support in case they were distressed due to study participation. The participants received course credits or monetary compensation in exchange for their participation. The ethics committees of the corresponding universities approved the study.

The original study had a mixed cross-sectional and longitudinal design. The cross-sectional data were used for the current study, meaning that the mediator variables were assessed at the same time as the outcome or in subsequent sessions, preventing us from ascertaining that the mediators indeed preceded the outcome. The current data consisted of measures administered once (yet over four separate sessions, on average within a seven-month interval). Childhood maltreatment, defined as the occurrence of abuse and/or neglect before the age of 15, was assessed in the first session. Adulthood victimization, defined as emotional, physical, and sexual victimization after age 14, was also assessed in the first session. The candidate mediating variables were assessed in sessions one to four. Table S1 in Supplementary Section II provides information about the sessions in which each measure was administered for each site. Several measures were administered more than once, but only participants' first responses to the pertinent questionnaires were used in the current analysis.

2.2. Sample characteristics

The sample (N = 2156) used in this study was between 17 and 58 years old (M = 19.94, SD = 2.89, n = 60 missing values). The sample was distributed across the sites as follows: 48.2% Groningen (n = 1039), 25.2% Amsterdam (n = 543), 12.4% Canterbury (n = 268), 10.5% Maastricht (n = 226), 3.1% Utrecht (n = 67), and 0.5% Leiden (n = 11). The participant's nationalities were German (n = 621, 28.8%), Dutch (n = 586, 27.2%), New-Zealander (n = 183, 8.5%), the remaining (n = 716, 33.2%) were from different nationalities, and 2.2% (n = 48) did not report this information. Of the participants who reported their relationship status (n = 1668), 61.5% (n = 1027) were single, 37% (n = 618) were in relationships, 1.3% (n = 21) or married, and 0.1% (n = 2) were divorced.

2.3. Measures

Operationalisation of the independent and outcome variables are described below, whereas the explored mediators are described in Supplementary Section I. Mean and sum scores were computed for all included variables, and the mean scores were standardized for the analyses, while the sum scores were computed only for the purpose of comparison with previous studies when deemed relevant. Age and nationality were assessed by open-ended questions, while relationship status was reported by a multiple-choice question. The descriptive information (e.g., mean, standard deviation, minimum, and maximum) regarding all variables is provided in Table 1.

The independent variable CM was assessed by the Childhood Trauma Questionnaire – Short Form (CTQ-SF; Bernstein et al., 2003), which consists of five subscales (emotional abuse: α = 0.86; physical abuse: α = 0.82; sexual abuse: α = 0.92; physical neglect: α = 0.61; emotional neglect: α = 0.90 in the present sample). The CTQ-SF consists of five items per subscale plus three validity items. Items were rated on a five-point Likert scale (1 = '*Never true*', 5 = '*Very often true')* with the additional option of '*I don't wish to answer this question*'. The internal consistency of the whole measure in the present study was good (α =

Table 1
Central tendency, dispersion statistics of the variables.

Measure	*n*	Mean (σ)	Min	Max	Skewness	Kurtosis	Mean sum (σ)	Min	Max	ICC
Alcohol Use	1611	1.03 (.61)	0	2.80	.14	−.54	5.14 (3.04)	0	14	.02
Childhood Trauma Questionnaire	1951	1.50 (.51)	1	4.92	1.90	4.95	36.73 (12.80)	25	123	.06
Connor-Davidson Resilience Scale	309	2.96 (.65)	1	4.43	−.23	−.04	62.15 (13.73)	21	93	.00
Coping Strategies Inventory	312	2.48 (.73)	1.08	4.67	.46	−.22	89.19 (26.29)	39	168	.28**
Difficulties in Emotion Regulation Scale	2094	2.44 (.83)	1	4.88	.60	−.25	19.54 (6.60)	8	39	.01
Dissociative Experiences Scale-II	1110	16.0 (12.39)	0	76.79	1.40	2.11	447.93 (346.86)	0	2150	.21**
Distress Tolerance Scale	1211	3.20 (.73)	1.20	4.93	−.21	−.60	48.05 (10.92)	18	74	.01
Emotional Reactivity Scale	263	1.55 (.90)	0	4	.31	−.62	32.50 (18.0)	0	84	.07
Experience in Close Relationship-Revised										
- Anxious	875	3.71 (.99)	1	6.33	−.19	−.42	66.78 (17.78)	18	114	.03
- Avoidant	723	4.28 (.52)	1.61	5.78	−.42	1.30	76.99 (9.32)	29	104	.05
Multidimensional Existential Meaning Scale	359	4.53 (.10)	1.2	7	−.39	.25	68.0 (14.82)	18	105	.01
Peritraumatic Dissociative Experiences Questionnaire	1468	2.18 (.98)	1	5	.69	−.36	21.79 (9.76)	10	50	.09
Post-traumatic Growth Inventory	298	3.35 (1.08)	1	5.90	−.10	−.70	70.42 (22.73)	21	124	.00
PTSD-Checklist for DSM-5	2001	1.16 (.85)	0	4	.69	−.33	43.17 (17.04)	0	80	.03
Risk Detection	1034	149.14 (54.43)	91.94	351.05	1.90	4.19				.00
Trauma Load	2004	.04 (.09)	0	.67	2.63	7.94	.22 (.51)	0	4	.01
Risky Sex Scale	1237	3.09 (.68)	1	5	−.46	.15	43.21 (9.48)	14	70	.00
Self-Blame Scale	261	2.41 (.91)	0	5.06	−.51	.98	38.50 (14.52)	0	81	.00
Sexual Assertive Scale for Women	494	3.04 (.44)	1.61	4	−.54	−.02	54.70 (7.97)	29	72	.02
Sexual Motive	2084	1.67 (.89)	1	5	1.46	1.48*	8.35 (4.46)	5	25	.00
Sexual Sensation Seeking Scale	484	2.10 (.55)	1	3.73	.26	−.33	23.12 (6.05)	11	41	.00
Somatoform Dissociation Questionnaire	435	1.10 (.46)	0	3.35	−.55	2.86*	22.02 (9.19)	0	67	.02
UCLA Loneliness Scale	570	1.02 (.69)	0	2.95	.51	−.46	20.30 (13.73)	0	59	.10
UPPS-P Impulsive Behaviour Scale	394	2.02 (.54)	1	3.77	.46	−.08	52.47 (14.14)	26	98	.12**
Young Schema Questionnaire										
- Autonomy	1630	2.14 (.10)	1	6	1.03	.63	21.43 (9.55)	10	60	.05
- Other Directed	1629	2.96 (.91)	1	5.90	.42	−.27	29.59 (9.09)	10	59	.03
- Rejection	1628	2.42 (.95)	1	5.96	.80	.19	60.54 (23.80)	25	149	.03

*Deviating from ±1.00; ICC = intraclass correlation; ** Interclass correlation higher than cut-off of 0.10 level.

0.81), which is comparable with previous studies (Bernstein et al., 1997; Paivio and Cramer, 2004). To estimate the number of participants with clinical severity of CM, the cut-offs recommended by Walker and colleagues (1999; sexual abuse ≥8, physical abuse ≥8, emotional abuse ≥10, physical neglect ≥8, and emotional neglect ≥15) were used, which resulted in a dichotomized variable (CM Status, 1 = scores above cut-offs on at least one of the CTQ subscales, 0 = no subscale score above cut-offs). These cut-offs were used only for the sake of descriptive information, whereas childhood maltreatment severity, computed by summing up the CTQ-SF items, was entered into the model as a continuous variable.

Adulthood victimization was assessed with the *Stressful Life Events Screening Questionnaire* (SLESQ; Goodman et al., 1998). This questionnaire measures 11 specific traumatic events of which seven are related to direct interpersonal violence (physical, sexual, and emotional abuse) and the rest are related to indirect interpersonal trauma and non-interpersonal trauma, such as a car accident. For each type of traumatic event, the participants first reported whether they had experienced this event. Those who indicated having experienced such an event were subsequently asked at what age this took place. Participants who indicated at least one form of direct interpersonal violence after the age of 14 were coded as 'victimized in adulthood' by a dichotomized variable ('Adulthood Victimization Status') with the second level being 'non-victimized in adulthood' for people without such experiences after the cut-off age.

The variable 'Victimization Status' was created based on the above-mentioned variables for childhood and adulthood victimization resulting in four categories of 'victimized exclusively in childhood', 'victimized exclusively in adulthood', 'victimized both in childhood and adulthood-revictimized', and 'non-victimized'. For the purpose of variable selection (see below), another dichotomized variable 'Revictimization Status' with two levels was created based on Victimization Status ('Non-revictimized' integrating three levels of victimization: exclusively in childhood, exclusively in adulthood, and non-victimized, versus 'Revictimized').

2.4. Reliability of the measures

The estimated reliability of the administered measures was inspected with a threshold of Cronbach's alpha >.70 (see Supplementary section II, Table S2). All Cronbach's alphas were >.70 indicating good estimated reliability, with the exception of the avoidant-subscale of the *Experiences in Close Relationships – Revised* (α = 0.57).

2.5. Data analysis

2.5.1. Missing values

A priori missing data by design was expected for two reasons. First, the longitudinal design of the study resulted in attrition in the sample size over the course of the study. Since the measures were administered in different sessions, the ones administered in later sessions had smaller sample sizes compared to the ones administered earlier. For instance, in total, 261 participants answered all items of the Self-blame Scale administered in Session 4 ($n_{missing} = 1895$), while 1110 participants provided complete responses on the Dissociative Experiences Scale-II administered in Session 1 and 2 ($n_{cases\ with\ missing\ values} = 1046$). In addition, due to the dissimilar distribution of the measures across universities and sessions in this multi-site study (see Table S1), the number of missing values varied depending on the site and session. The percentages of missing values per measure and site in the two groups of revictimized versus non-revictimized individuals are reported in Tables S3 and S4 in Supplementary Section II. As shown in Table S3, the differences between revictimized and non-revictimized people in the percentages of missing values ranged from zero for Risky Sex Scale to 12.6% for Distress Tolerance Scale. In total, the percentages of missing values were higher in the non-revictimized group for 19 measures compared to revictimized group, while the percentages were higher in the revictimized group for 12 measures compared to the non-revictimized group. Therefore, the revictimized group tends to have missing values for fewer measures compared to the non-revictimized group. The difference in the percentages of missing values across the sites was between 16.9% for Sex Motives and DERS and 92.2% for Distress Tolerance Scale. It seems that the difference in the rate of missingness across the sites increases for the measures administered in later sessions due to full drop-outs in some sites. For instance, the rate of drop-out for Utrecht and Leiden were 100% from session two onward. To deal with the missing values, we applied full-information maximum likelihood estimation, which uses all available information (Rosseel, 2012).

No imputation was conducted because missingness was partially due to the design of the study. In addition, no measure met a priori formulated rules set by the authors: a) the individuals eligible for imputation comprised of more than 5% of the participants that had responded to all items, as suggested by Jakobsen et al. (2017); b) missing values were less than 50% of a whole scale, this criterion was set to assure that enough information on each measure was provided on which imputations could be computed; c) no imputation would be carried out on dichotomized variables since they were measured by single items.

2.5.2. Software used for data analysis

A structural equation modelling (SEM) analysis with Modification Indices (Thakkar, 2020; MIs) was conducted using the *Lavaan* package (Rosseel, 2012) in R-Studio. The remaining analyses such as MCAR tests and Cronbach's alphas were performed in SPSS 25.

2.5.3. Adequacy of sample size for SEM

To test whether our sample satisfies the requirement for achieving stable covariances in SEM, we applied the rule of at least 10 participants per measure. Since the maximum number of administered instruments was 33, the minimum number of participants needed was 330. In the whole sample, we had different sample sizes per measure (Table 1), however, most measures had a sample size larger than 330, and for the five variables with fewer participants, the sample was only slightly smaller than the required sample size.

2.5.4. Model building

A *p*-value of .05 (two-sided) was used as the threshold for statistical significance throughout the data-analysis process. The 'null' model (Fig. 1) was kept as simple as possible: CM as continuous independent variable, adulthood victimization as a dichotomized outcome variable and all other measures ($k = 31$) as mediators. The mediators of PTSD symptoms, (trait and state) dissociation, alcohol/substance use, sexual risk-taking, sex motives, sexual assertiveness, coping, emotion dysregulation, early maladaptive schemas, attachment, self-blame, and risk detection were entered into the model because previous studies provided evidence in favor of these factors. Although research on somatoform dissociation was still scarce, we included this variable in the model since available data points to the association between childhood maltreatment and this form of dissociation (Maaranen et al., 2004; Henschel et al., 2019). A second group of variables consisting of resilience (Connor et al., 2003), post-traumatic growth (Shakespeare-Finch and Lurie-Beck, 2014), distress tolerance (Marshall-Berenz et al., 2010), emotional reactivity (Glaser et al., 2006), and meaning in life (Owens et al., 2009) were entered into the model considering that available data have shown the association between these factors and trauma-related symptoms. In addition, these factors seemed theoretically relevant to revictimization. The third group of variables, sexual sensation seeking (Monks et al., 2010), impulsivity (Nedelec, 2018), emotion recognition (Lieberz et al., 2018), and loneliness (Hawker and Boulton, 2000), were selected since evidence showed that these factors were related to (bully) victimization. All the variables were entered into the model as observed variables, but presented in oval in all figures to provide a better

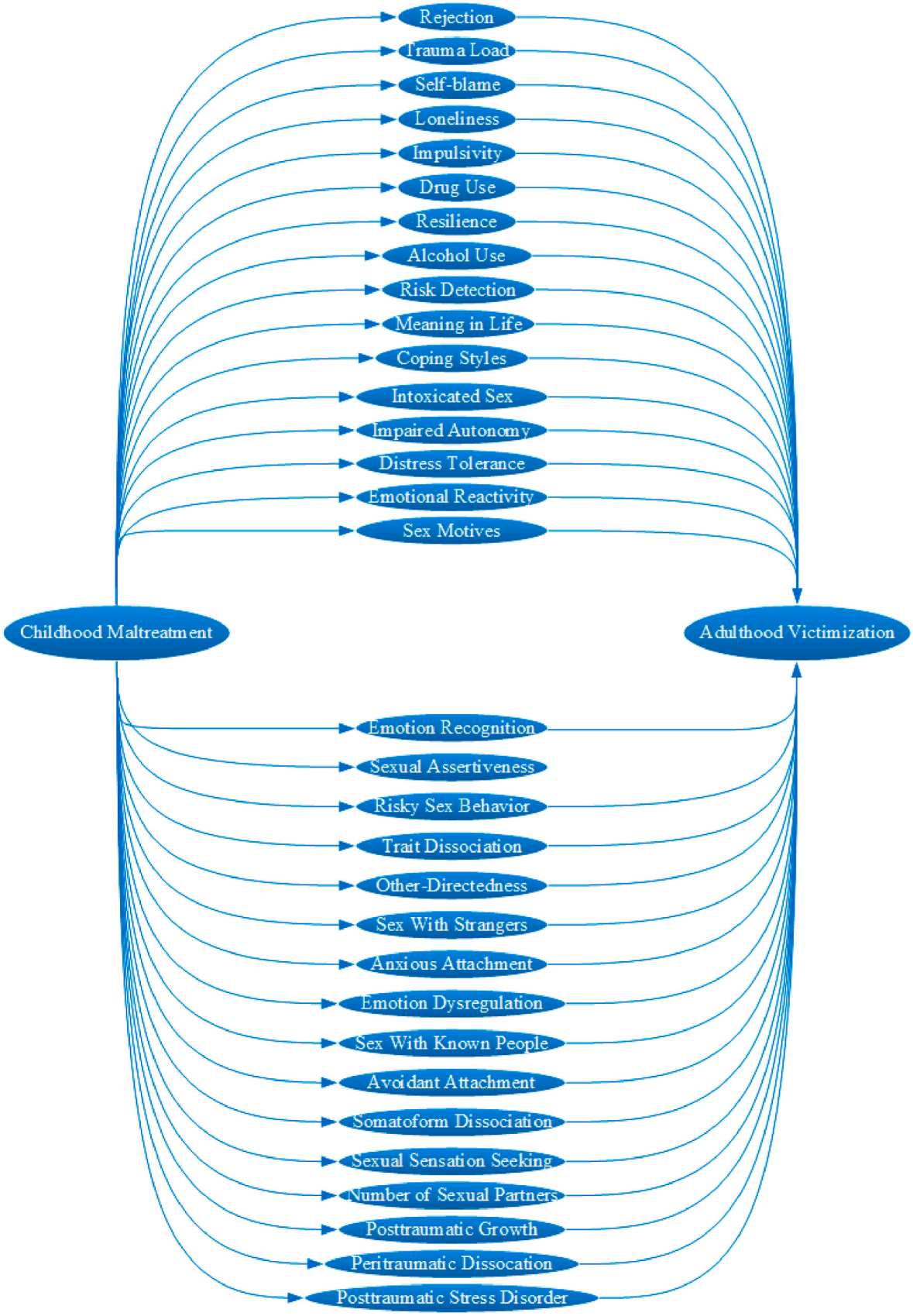

Fig. 1. Start model.

presentation of the pathways. Then, to obtain a parsimonious 'starting' model, we removed all non-significant pathways between either CM and the mediators or between adulthood victimization and the mediators in a stepwise fashion. Pathways were removed one by one, starting with the pathway with the highest non-significant *p*-value, re-estimating the model, and then removing the next pathway with the highest non-significant *p*-value. The potentially occurring covariances between removed paths were set to zero, followed by testing the new model and detecting, again, the pathway with the highest non-significant *p*-value. New covariances that emerged between all discarded pathways were set to zero to control for model flow. This process was repeated until all pathways were statistically significant. Together, these steps resulted in a starting model on which Modification Indices (MIs) were implemented in order to investigate relationships between the mediators. MIs show to what extent chi-square (χ^2) decreases when including parameters and (uni- or bi-) directional relationships (Rosseel, 2012). The original plan was to adhere to a fully data-driven model. However, such an approach appeared not always feasible. To elaborate, the modification indices recommended pathways that would improve the model fit, but were not conceptually relevant, for instance, pathways directing from the mediators to childhood maltreatment. These pathways were not added to the model. In addition, we did not include bidirectional relationships suggested by MIs due to the high number of variables in the model and thereby the high number of recommended bidirectional pathways, which could interfere with the parsimony of the model. Therefore, we chose a partially data-driven model as a negotiation between conceptual and statistical levels.

The suggested parameters (pathways) with the highest MI values were stepwise added to the starting model if they were supported by theories or previous research and their corresponding MIs led to 10 units or greater decrease in χ^2. Furthermore, recommended covariances between variables were only included for two subscales of one overarching measure (e.g., early maladaptive schema domains) or when theoretical reasons were present (e.g., distress tolerance and emotional dysregulation). By default, recommended indexes (pathways) were included in the new model unless there was compelling theoretical or empirical evidence, as evaluated by two of the authors, suggesting the exclusion of the indexes. This approach was chosen to be as data-driven as possible. Whenever adding MIs yielded non-significance results in another path, the non-significant path was discarded. This process was iterated until the change in χ^2 values was smaller than 10 or the Comparative Fit Index (CFI) reached the cut-off of 0.95 (Shi et al., 2019; West et al., 2012).

Lastly, for the determination of the most predictive pathways between CM and adulthood victimization, the standardised beta-coefficients (*b's*) corresponding to individual pathways were multiplied (denoted *d*), with higher scores indicative of stronger predictive pathways. The most predictive paths were based on a combination of the smallest number of variables with the highest available beta-coefficients

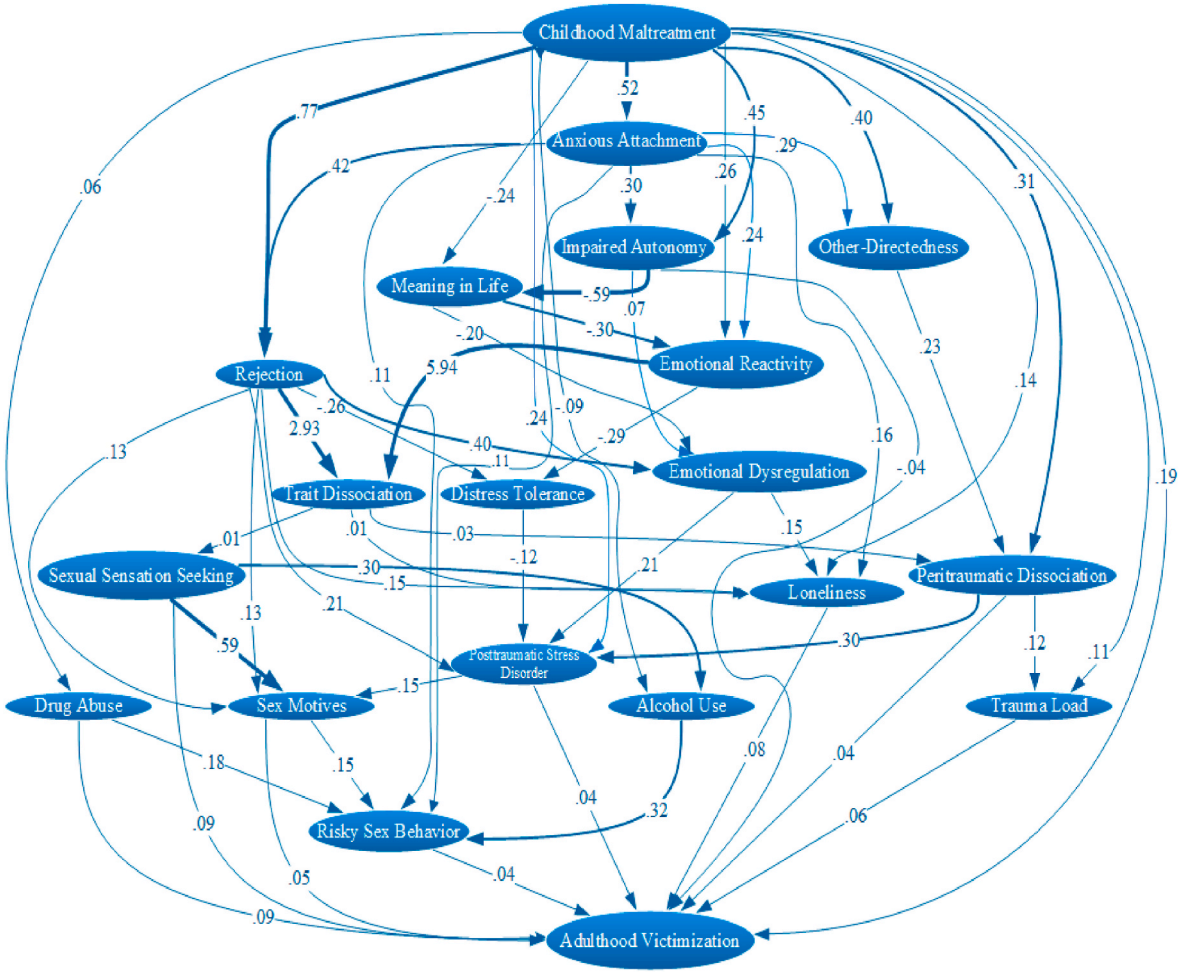

Fig. 2. Model with 31 mediators

Note. Thickness of the lines shows the strength of the association between the variables based on beta-coefficients (weak ≤0.30, moderate = between 0.30 and 0.49, high ≥0.50). The pathways related to the variables that were neither first-order nor second-order mediators are not shown in this figure for the sake of simplicity. These pathways belong to resilience, coping strategies, total number of sexual partners, self-blame, somatoform dissociation, sexual assertiveness, and sexual sensation seeking.

running between CM and adulthood victimization. Those mediators linking childhood and adulthood victimization without involvement of the intervening effects of other variables were considered as 'first-order', whereas mediators with solely intervening properties were named 'second-order' mediators. Fig. 2 ($\chi^2(324) = 793.743$, $p < .001$, $CFI = 0.95 = 0.95$, $TLI = 0.94 > 0.95$, $RMSEA = 0.03 < 0.06$, $SRMR = 0.06 < 0.08$; cut-offs values for model fit indices adopted from Hu and Bentler (1999)) shows the model created based on the above-mentioned procedure. Table S5 shows the MI values (i.e., change in chi-square values) related to each recommended pathway, the associated chi-square statistics and *CFI* values after adding a specific path for this model.

2.5.5. Variable selection

Given the complexity of the final model (Fig. 2), we selectively entered the mediators into the starting model to acquire a simplified model with more clinical implications. To find the most relevant variables, we ran logistic regression and *t*-test analyses for each variable separately. In the logistic regression model, the independent variables consisted of the candidate mediating variables and the dependent variable was Revictimization Status (revictimized vs. non-revictimized). For the *t*-test analysis, Revictimization Status was the independent variable and the mediators were the dependent variables. As reported in Table S6, logistic regression results suggested the inclusion of 24 variables, while the *t*-test recommended including 23 variables. As a more conservative decision, we entered 24 variables in the third and final model and repeated the model-building steps that resulted in the model presented in Fig. 3. Table S7 shows the MI values related to each recommended pathway, the corresponding chi-square statistics and CFI values after adding a specific path for the final model. Since the third model was more parsimonious compared to the second one, we reported the findings in the Result section based on the last model.

2.5.6. Assumption check for the SEM model

The assumptions of multiple linear regression also apply to SEM (Streiner, 2005), particularly for the paths consisting of continuous variables (i.e., the pathways between childhood maltreatment and mediators and the paths between mediators in this case). The assumption of linearity was checked by computing skewness and kurtosis values (see Table 1). The majority of variables ($k = 21$, skewness <1.0) were slightly skewed, five were moderately skewed (skewness between 1 and 2.3), and one (skewness >2.3) was severely skewed based on commonly used cut-offs (Lei and Lomax, 2005). Based on the same cut-offs for kurtosis, most variables ($k = 20$) were distributed slightly non-normal, three were moderately non-normal, and four were severely non-normal. However, given the nature of the variables such as dissociation and PTSD symptoms, these phenomena were not expected to be normally distributed. Hence, no transformation was conducted. In order to assess the assumption of linearity, it was not feasible to examine all scatterplots due to numerous possible pairs of variables. Therefore, this assumption was assessed via visual inspection of the scatterplots between random variables for which point-biserial and Pearson correlations were calculated. To elaborate, the relationship between the independent variable (CM) and three mediators, association between the dependent variable (adulthood victimization) and three mediators, and the relationship between three mediators ($n = 9$) were assessed, and the results showed that this assumption was met. With respect to the assumption of multivariate normality of the continuous variables, the Mahalanobis distance was assessed (Gallego et al., 2013). A critical $\chi 2$ value of 43.77 ($df = 30$) was employed for the current model (Tabachnick and Fidell, 2014). Only 9 participants were identified as multivariate outliers.

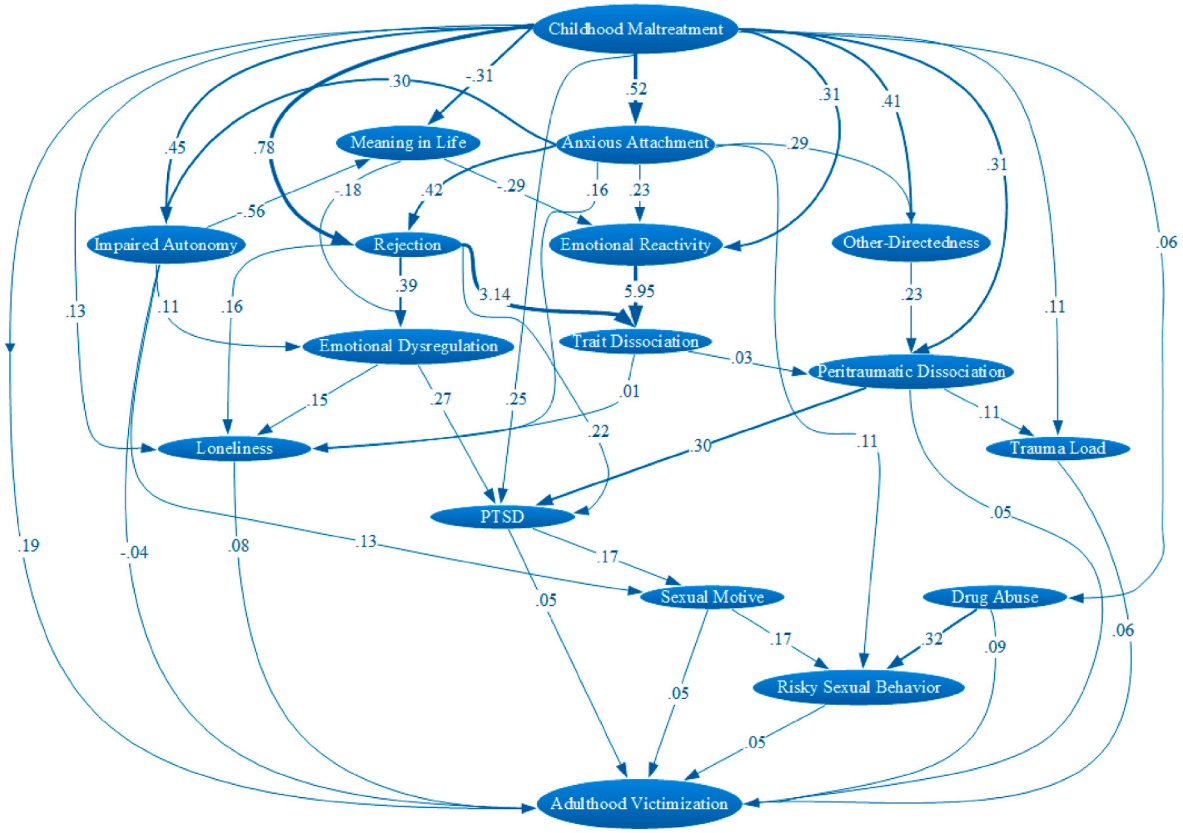

Fig. 3. Model with 24 mediators

Note. Thickness of the lines shows the strength of the association between the variables based on beta-coefficients (weak ≤0.30, moderate = between 0.30 and 0.49, high ≥0.50). For the matter of simplicity, we did not include the paths belonging to mediators that were not connected to either childhood maltreatment or adulthood victimization. For the full model, see Fig. S1 in Supplementary Section II.

These outliers were not considered problematic, given the large sample size, and therefore retained in the model. To check for multicollinearity, all pairwise correlations were checked (Table 2). A correlation coefficient of 0.40 was used as an indication of an issue regarding discriminant validity (Grewal et al., 2004). Of the total number of coefficients (n = 465), 16.99% (n = 79) showed a coefficient value of 0.40 or higher. However, since nearly half of these (n = 38) were included in the final model, only 8.82% (n = 41) of the correlations exhibited a relatively high value. For further investigation, variable inflation factors (VIFs) were computed for ten variables based on the pathways in the final model. The VIF values were between one and two, which provided support for an absence of worrisome multicollinearity between the variables. Lastly, the assumption of independence of observations between sites was assessed via intraclass correlation coefficients (ICCs) using the *mle4* package in R-Studio (Bates et al., 2015). The cut-off of 0.10 was employed, indicating low dependency between observations (Koo and Mae, 2016). For three measures, nestedness within centers was observed, whereas no ICC could be calculated due to zero variance for several variables (ICC; Table 1). By design, no dependency between observations within individuals was expected given the usage of the first administration of those instruments that were iteratively administered. For the pathways including the dependent variable (adulthood victimization), we did not find any evidence that the assumptions of logistic regression were unreasonable.

3. Results

3.1. Descriptive results

In the subsample with no missing values on the CTQ, 42.3% (n = 911) reported at least one type of CM, of which 47.7% (n = 435) indicated one type, 23.3% (n = 212) two types, 16.4% (n = 149) three types, 8.9% (n = 81) four types, and 3.7% (n = 34) five types of CM. Of the subsample with no missing values on the SLESQ, 41.4% (n = 892) reported adulthood victimization. The most common form of abuse during childhood and adulthood was emotional and sexual abuse, respectively. More information about the rate of each type of abuse in childhood and adulthood is represented in Table 3. Of those without missing values on the CTQ and SLESQ (n = 1930), 37.6% (n = 726) were not victimized at any stage, 19.3% (n = 373) experienced maltreatment exclusively during childhood, 16% (n = 309) experienced abuse exclusively during adulthood, and 27% (n = 522) were revictimized. Table 4 presents the prevalence of different forms of adulthood victimization based on different types of CM. Across CM types, the most common form of victimization in adulthood was sexual victimization (Table 4). Among people with a history of CM, 58.3% (n = 522) experienced adulthood victimization, while this rate was 29.9% (n = 309) in people with no history of CM. This difference was statistically significant (X^2 (1, n = 1930) = 158.66, $p < .001$). The odds of victimization in adulthood were 3.29 times greater for CM survivors compared to people without a history of CM.

3.2. SEM model

The fit indices showed that the final model (Fig. 3) fitted the data well ($\chi^2(233) = 670.03$, $p < .001$, $CFI = 0.95$, $TLI = 0.94$, $RMSEA = 0.03$, $SRMR = 0.07$). To compute an effect size for the final model, the pseudo R-squared of McFadden (1974) was calculated since the dependent variable of adulthood victimization in the model was binary. The value of McFadden's pseudo R-squared was 0.97, which showed that the model had an excellent fit, which was implied by the model fit indices as well. It is noteworthy that the interpretation of a pseudo R-squared is not as straightforward as the ordinary R-squared because the former shows model improvement over a null model (a model without the independent variables), but it does not directly measure the explained variance by the independent variables like R-squared does. In addition, the pseudo R-squared in this study might be inflated by the complexity of the model. Testing the model in a different sample would provide more information about this observed effect size.

3.2.1. Direct relationship between CM and adult victimization

The direct pathway from CM to adulthood victimization was significant ($\beta = .19$, $p = .001$).

3.2.2. First-order mediators

As shown in Fig. 3, the first-order mediators linking CM to adulthood victimization were peritraumatic dissociation (d = 0.02), PTSD symptoms (d = 0.01), trauma load (d = 0.01), loneliness (d = 0.01), and drug use (d = 0.01). In addition, impaired autonomy was also a first-order mediator with a positive association with childhood maltreatment (β = 0.45), but negatively associated with adulthood victimization (β = −0.04) with d = −0.02, which might indicate a statistical artefact.

3.2.3. Second-order mediators

Attachment Styles. Anxious attachment linked CM to victimization in adulthood via four different pathways: a) via loneliness (d = 0.01); b) via risky sex behavior (d = 0.003); c) via other-directedness domain, which in turn was related to peritraumatic dissociation (d = 0.002), d) via rejection domain, emotion dysregulation, and PTSD symptoms in a consecutive order (d = 0.001). Early Maladaptive Schemas. Three domains of maladaptive schemas (rejection, impaired autonomy and other-directedness) were among the most important second-order mediators in the SEM model. Rejection domain linked CM to adulthood victimization via three important pathways; the first one was through PTSD symptoms (d = 0.01), the second one through loneliness (d = 0.01), and the last one through emotion dysregulation and then PTSD symptoms in a consecutive order (d = 0.004). Other directedness was an intervening variable between CM and adulthood victimization through peritraumatic dissociation (d = 0.005). Impaired autonomy domain linked CM to victimization in adulthood through sex motives (d = 0.003) in a pathway, and via emotion dysregulation and then PTSD symptoms in a consecutive order in another pathway (d = 0.001).

Meaning in Life. CM was related to meaning in life, which in turn was associated with emotion dysregulation and PTSD symptoms in a consecutive order, which in turn was related to adulthood victimization (d = 0.001).

Drug Use. CM was associated with drug use, which in turn was associated with risky sex behavior, which finally was associated with victimization in adulthood (d = 0.001).

Peritraumatic Dissociation. Dissociation during traumatic events linked CM to adulthood victimization through PTSD symptoms, sex motives, and risky sex behavior in a consecutive order (d = 0.0001).

3.2.4. Mediators functioning as networks

Two to six pathways passed through several mediators with direct connection with CM (i.e., anxious attachment, meaning in life, rejection and impaired autonomy domains, PTSD symptoms, peritraumatic dissociation, and loneliness). These mediators with such a feature were called networks by the authors. Although risky sex behavior was not directly associated with CM, three other pathways connected to this variable, which in turn was related to adulthood victimization.

3.3. Neither first nor second-order mediators

Several variables in the model are not displayed in Fig. 3 because they were not directly or indirectly associated with CM or adulthood victimization or both, although they were connected to other mediators. The variables directly and/or indirectly linked to CM, but not to adulthood sexual victimization include sexual assertiveness, sex with strangers, the number of sexual partners, somatoform dissociation, distress tolerance, and coping. The variable (in) directly associated with adulthood victimization, but not with CM was sexual sensation seeking

Table 2
Correlation between included variables.

	AS	AV	CM	CO	DT	DU	ED	EM	ER	IM	IS	LO	ML	PD	PG	PT	RD	RE	RS	SA	SB	SD	SF	SM	SP	Ss	SS	TD	TL	YS
AC	.10	**.34***	**−.01***	.10	−.02	**.38***	.01	.05	−.10	**.20***	**.30***	**−.14***	−.20*	.03	.04	.03	.01	−.10	**.40***	**−.20***	−.05	.10*	**.13***	**.20***	**.24***	**.10***	**.30***	.02	.10*	−.01
AS		**.66***	**.23***	**.30***	**−.40***	.44*	**.40***	**.50***	.06	**.30***	−.02	**.40***	**−.30***	**.24***	.05	**.35***	−.20	−.12	**.24***	**−.31***	.10	.10	.12*	**.22***	.01	.01	**.20***	**.24***	.02	**.51***
AV			**.31***	.41*	**−.40***	**.16***	**.45***	**.70***	.01	**.60***	.05*	**.74***	−.30*	**.53***	.21	**.72***	−.00	.17	**.60***	**−.05***	.16	**.60***	.03	**.60***	**.30***	.30*	**.92***	**.03***	**.70***	**.70***
CM				**.31***	**−.26***	.25*	**.33***	**.40***	−.03	**.23***	−.00	**.33***	**−.40***	**.30***	−.01	**.50***	.01	−.13*	**.10***	**−.20***	**.20***	**.21***	.05	**.20***	**.11***	.10*	.03	**.30***	**.18***	**.50***
CO					**−.33***	.01	**.31***	**.50***	−.02	**.44***	−.10	**.40***	**−.40***	**.30***	−.05	**.40***	.10	**−.30***	**.20***	**−.30***	.22*	**.30***	.04	**.20***	.05	.10	**.17***	**.40***	.12*	**.44***
DT						−.10	**−.62***	**−.60***	.04	**−.30***	−.20	**−.38***	**.31***	**−.27***	−.05	**−.50***	−.02	**.30***	**−.18***	**.21***	−.12	**−.20***	.01	**−.24***	−.04	.03	−.09*	**−.27***	**−.10***	**−.49***
DU							.13*	.31*	−.01	.50*	**.19***	−.10	−.34*	.10	.25*	.14*	.00	−.01	**.95***	−.03*	.12	.50	**.06***	**.40***	**.55***	.41*	**.10***	.01	.21*	.05
ED								**.60***	.03	**.30***	.03	**.43***	**−.60***	**.30***	−.10	**.60***	.02	**−.40***	**.16***	**−.20***	**.24***	**.20***	−.01	**.23***	.01	−.03	.03	**.32***	**.10***	**.62***
EM									−.01	**.60***	.10	**.42***	**−.43***	**.40***	.02	**.52***	.04	−.41*	**.30***	**−.30***	**.18***	**.30***	−.02	**.24***	−.05	−.10	.14	**.42***	**.20***	**.54***
ER										−.04	−.01	.10*	−.12	−.00	−.10	−.00	**−.14***	−.04	.02	.02	−.05	.02	−.10*	−.04	−.10	−.04	.04	−.10	−.10	.01
IM											.01	**.30***	**−.40***	**.33***	.13*	.33*	.01	**−.20***	**.20***	−.30*	.10	**.30***	.04	**.20***	.12	.04	**.25***	**.40***	**.14***	**.32***
IS												−.17	−.10	−.01	.02	.02	.01	−.02	.10*	−.10	.02	.10	**.24***	**.22***	**.30***	.10*	**.15***	−.03	−.01	−.04
LO													**−.40***	**.30***	−.10	**.41***	−.10	**−.40***	.10*	**−.20***	**.25***	.10	−.10	**.13***	−.10	−.05	.05	**.40***	.10	**.51***
ML														**−.20***	**.30***	**−.31***	−.13	**.65***	−.20*	.21*	**−.25***	**−.30***	−.01	−.11*	.01	.20*	−.11	**−.30***	−.13*	**−.53***
PD															**.24***	**.60***	−.00	.00	.05	**−.19***	.13*	**.24***	−.04	**.20***	.10*	.03	**.18***	**.43***	**.23***	**.40***
PG																.13*	−.04	**.54***	.05	−.01	−.05	.01	.01	.10	.10	.12	.08	.20*	.04	−.10
PT																	.03	−.12*	**.20***	**−.20***	**.20***	**.30***	.05	**.30***	**.10***	.05	.11*	**.40***	**.22***	**.64***
RD																		−.04	.04	−.12*	.05	**.20***	.20*	.06	**.15***	.05	−.10	.00	.00	.01
RE																			−.11	**.20***	−.23*	**−.20***	.02	−.02	.01	.10	.03	−.12*	−.04	**−.40***
RS																				**−.21***	.14*	.11*	**.20***	**.31***	**.13***	.10	**.31***	.10*	.04	**.20***
SA																					−.20*	**−.14***	**−.20***	**−.20***	**−.22***	−.13*	−.13*	**−.21***	−.02	**−.30***
SB																						**.24***	−.12	.10	−.01	−.20	−.00	**.17***	−.01	**.20***
SD																							−.01	.10	.10	.10	.05	**.30***	**.20***	**.23***
SF																								**.20***	**.30***	**.11***	**.20***	−.01	.04	.02
SM																									**.40***	**.20***	**.40***	**.15***	**.11***	**.24***
SP																										**.55***	**.40***	.00	.10*	.01
Ss																											**.20***	.05	.04	.01
SS																												**.20***	**.16***	.01
TD																													**.13***	**.34***
TL																														**.15***

* Significant on 0.01 or 0.05 p-value (two-tailed) CM = Childhood Maltreatment– > **ALPHABETICAL ORDER ER = Emotional Regulation** Note: bold numbers are inspired by the order of the instrument displayed in Appendix I.

Note: NC is an abbreviation of 'No Cases' indicative that a combination of these variables was absent in the current sample.Note: separate sexual questions (e.g. 'number of sexual partners'), trauma load and childhood and adulthood victimization are not displayed.

* Significant at 0.05 level (two-tailed)AC = Alcohol Consumption; AS = Attachment Style s; AV = Adulthood Victimization; CM = Childhood Maltreatment; Co = Coping; DT = Distress Tolerance; DU = Drug Use; ED = Emotional Dysregulation; EM = Emotional Reactivity; ER = Emotion Recognition (GERT); IM = Impulsivity; IS = Intoxicated Sex; LO = Loneliness; ML = Meaning in Life; PD = Peritraumatic Dissociation; PG = Posttraumatic Growth; PT = PTSD; RD = Risk Detection; RE = Resilience; RS = Risky Sex Behavior; SA = Sexual Assertiveness; SB = Self-Blame; SD = Somatoform Dissociation; SF = Sex with Friends; SM = Sex Motive; SP = Number of Sexual Partners; Ss = Sex with Strangers; SS = sexual sensation seeking; TD = Trait Dissociation; TL = Trauma Load; YS = Young's schemas.

* Significant on 0.01 p-value (two-tailed).

Table 3
Prevalence of different forms of childhood maltreatment and adulthood victimization.

	Childhood					
	Physical Abuse	Sexual Abuse	Emotional Abuse	Emotional Neglect	Physical Neglect	Childhood maltreatment
Sample size (*n*)	2058	2042	2047	2022	1993	1951
Frequency (*n*)	255	245	685	288	425	911
Percentage(%)	11.8%	11.4%	31.8%	13.4%	19.7%	42.3%
Missing (*n*)	98	114	109	134	163	205
Missing (%)	4.5%	5.3%	9.5%	6.2%	7.6%	9.5%

	Adulthood				
	Physical Abuse	Sexual Abuse	Emotional Abuse	Weapon	Adulthood victimization
Sample size (*n*)	2061	2057	2048	2064	2036
Frequency (*n*)	214	588	366	67	892
Percentage (%)	9.9%	27.3%	17.0%	3.1%	41.4%
Missing (*n*)	95	99	108	92	120
Missing (%)	4.4%	4.6%	5.0%	4.3%	5.6%

Table 4
Prevalence of different forms of revictimization.

Adulthood								
Childhood	Sexual Abuse	Responses	Physical Abuse	Responses	Emotional Abuse	Responses	Weapon Threat	Responses
Emotional Abuse missing (%)	268 (39.1%)	682 3 (.4%)	136 (19.9%)	683 2 (.3%)	237 (34.6%)	673 12 (1.8%)	31 (4.5%)	685 none
Physical Abuse missing (%)	114 (44.7%)	253 2 (.8%)	83 (32.5%)	252 3 (1.2%)	84 (32.9%)	250 5 (2.0%)	11 (4.3%)	254 1 (.4%)
Sexual Abuse missing (%)	119 (48.6%)	245 none	51 (20.8%)	243 2 (.8%)	60 (24.5%)	243 2 (.8%)	17 (6.9%)	245 none
Emotional Neglect missing (%)	114 (39.6%)	285 3 (1.0%)	65 (22.6%)	286 2 (.7%)	102 (35.4%)	283 5 (1.7%)	13 (4.5%)	288 none
Physical Neglect missing (%)	155 (36.5%)	424 1 (.2%)	79 (18.6%)	423 2 (.5%)	111 (26.1%)	418 7 (1.6%)	15 (3.5%)	425 none

(See pathways corresponding to these variables in Fig. S1 in Supplementary Section II).

4. Discussion

The objective of the current study was to understand which factors mediate the relationship between childhood maltreatment and adulthood victimization, and to detect pathways with the strongest association with revictimization using a (partially) data-driven SEM analysis. The findings show that childhood maltreatment severity was directly related to victimization in adulthood. The most important first-order mediators (i.e., mediators that are the only mediator in a pathway) connecting CM severity to adulthood victimization were peritraumatic dissociation, PTSD symptoms, trauma load, loneliness, and drug use. Second-order mediators (i.e., mediators involved in pathways consisting of more than one mediator) were attachment styles, early maladaptive schema domains, meaning in life, and peritraumatic dissociation. Several factors had a networking function such that various pathways passed through these first and second-order mediators (i.e., anxious attachment, rejection/impaired autonomy schema domains, PTSD symptoms, peritraumatic dissociation, and loneliness). The observed pathways will now be discussed.

4.1. First-order mediators

4.1.1. Peritraumatic dissociation

Our finding on the role of peritraumatic dissociation in the link between CM and adult victimization is in line with a prospective study on females with a documented history of childhood sexual abuse (Noll et al., 2003), but inconsistent with a cross-sectional study on females recruited from the general population (Irwin, 1999). The inconsistent results might be due to different definitions for childhood and adulthood victimization, different populations and/or designs. The mediating effect of peritraumatic dissociation on revictimization in the current study can be explained by assuming that dissociation at the time of trauma interferes with information processing and integration of memories, a process that does not allow an individual to learn from past traumatic experiences or have access to relevant information in similar situations, thereby leaving the victims with further risk of abuse (Chu, 1992; Irwin, 1999). This finding is also consistent with Betrayal Trauma formulation (Freyd et al., 2007).

4.1.2. PTSD symptoms

Our result regarding the indirect effect of CM severity on adulthood victimization via PTSD symptoms is consistent with previous cross-sectional (Baca et al., 2021; Scoglio et al., 2019) and longitudinal research (Jaffe et al., 2019; Papalia et al., 2020). Although available evidence supports the detrimental effect of PTSD on revictimization, it is not yet clear how PTSD symptoms increase this risk. One explanation is that PTSD, particularly hyperarousal, might compromise risk detection (Messman-Moore and Long, 2003; Fragkaki et al., 2017), which is supported by two studies showing a positive relationship between PTSD, particularly re-experience and hyperarousal, and risk detection (Wilson et al., 1999, Marx and Soler-Baillo, 2005). The role of risk detection was not supported in our study because it was not related to revictimization in the variable selection phase and, thus not included in the model. Potential explanations for the contradictory results regarding the effect of risk detection include the likelihood that revictimized individuals are not homogenous in terms of risk detection and the possibility that the assessment of risk detection used in prior studies might not have ecological validity (for more explanation see Gidycz et al., 2006). Another explanation of the link between PTSD and revictimization is that PTSD might prevent a proper reaction in threatening situations (Messman-Moore and Long, 2003), in a way that protective responses such as assertiveness or escape (Chu, 1992) are not applied, possibly due to the intensity of negative emotions and physiological reactions at the

time. Finally, PTSD symptoms influencing verbal and non-verbal cues might signal vulnerability to potential perpetrators (Cloitre et al., 1997), hence making these individuals more prone to revictimization.

4.1.3. Trauma load

The mediating role of trauma load (combined indirect interpersonal trauma and non-interpersonal trauma) found in the present study is supported by two studies examining the direct association between interpersonal and non-interpersonal trauma (Cougle et al., 2009; Lilly, 2011). However, it is in contrast with a previous study reporting the absence of a direct association between interpersonal and non-interpersonal trauma, and the presence of an indirect effect of non-interpersonal trauma on revictimization through PTSD (Jaffe et al., 2019), a pathway that was not found in our study. A possible explanation for the observed mediating effect of trauma load is that people with CM might suffer from higher general psychological distress (Lindhorst et al., 2009; Orcutt et al., 2005), which might enhance the likelihood of exposure to non-interpersonal trauma (i.e., leading to higher trauma load), which consequently can affect mental health in a cyclical pattern and result in further vulnerability to interpersonal victimization in adulthood. Further research is necessary to clarify the mediating role of trauma load in revictimization, particularly related to non-interpersonal trauma.

4.1.4. Loneliness

The mediating effect of loneliness observed in the current study was supported by a longitudinal study indicating an association between victimization in childhood and feelings of loneliness in adolescence (Matthews et al., 2022), as well as by cross-sectional evidence regarding the association between adolescent victimization and loneliness (Cava et al., 2018). In addition, two studies showed a relationship between childhood sexual abuse and loneliness (Boyda et al., 2015; Gibson and Hartshorne, 1996) of which one indicated a relationship between intimate partner violence and loneliness (Boyda et al., 2015). People with a history of CM might experience loneliness due to insecure attachment styles (Akdoğan, 2017), which might make them less selective in choosing dating partners or result in staying in an abusive relationship due to stronger need to connect to others (Cava et al., 2018). The assumption about the association between loneliness and insecure attachment styles is further supported by a pathway from CM severity to anxious attachment and rejection schema domains in our study. Further research on the impact of loneliness for revictimization is critical since available evidence is limited to our findings.

4.1.5. Drug use

The current findings are consistent with longitudinal evidence showing higher observed drug use among women who experienced incapacitated sexual revictimization compared to expected use in a Chi-square analysis (Messman-Moore et al., 2013) and with cross-sectional results indicating greater substance use in revictimized women compared to the ones who were not victimized or were victimized only once (Walsh et al., 2014). In contrast to our study, a longitudinal study did not find evidence for the mediational role of drug use in sexual revictimization (Lindhorst et al., 2009). However, in general, evidence on drug use appears inconsistent, which might be due to methodological differences, such as different populations and designs across studies. The mechanisms linking drug use to revictimization are not yet well analyzed, but it may well be that substance use serves as a coping mechanism to deal with negative emotions originating from CM and could subsequently increase exposure to potential perpetrators and consequently the risk of revictimization. In addition, intoxicated individuals might be perceived as more vulnerable to perpetrators (Messman-Moore and Long, 2003).

4.1.6. Impaired autonomy schemas

The mediating influence of impaired autonomy schemas in the present study, which indicated a negative association with adulthood victimization, is inconsistent with Young's theory (Young et al., 2003), and prior studies (Atmaca and Gençöz, 2016; Gay et al., 2013). Therefore, it is assumed that the negative mediational role could actually be a statistical artefact, and that these schemas do not have an inverse relationship with adulthood victimization. This explanation is in line with a positive association that was found between impaired autonomy and adulthood victimization ($r = .11$, $p < .001$), which shows that the combination of variables in the model might have switched the direction of association between these two variables.

4.2. Second-order mediators

The mediators linking CM to revictimization via other intervening variables included in the current research further our knowledge about potential developmental trajectories of revictimization and the mechanisms connecting first-order mediators to revictimization.

4.2.1. Attachment styles

Unlike the avoidant attachment style, which did not show any association with revictimization, anxious attachment was an intervening variable between CM severity and adulthood victimization via loneliness, risky sex behavior, peritraumatic dissociation as well as a pathway that included the rejection schema domain, emotion dysregulation, and PTSD in a consecutive order. The role of anxious attachment in revictimization found in this study is in line with the findings of a study reporting that anxious, but not avoidant, attachment was related to sexual revictimization (Brenner and Ben-Amitay, 2015). In addition, two studies exclusively examined anxious attachment and supported its effect on revictimization (Bockers et al., 2014; Hocking et al., 2016). In contrast to these findings, another study did not find such an effect for anxious, neither for avoidant attachment (Gay et al., 2013). This inconsistency might be due to using a different measure and an exclusive focus on violence inflicted by intimate partners in Gay et al. (2013) study.

Two important hypotheses about the role of anxious attachment versus avoidant attachment on revictimization are proposed. One implies that anxious attachment, characterized by excessive proximity seeking to attachment figures, might encourage tolerating abusive relationships due to fear of rejection, while avoidant attachment is associated with more distant relationships (Hocking et al., 2016). Another possibility is that abusive men might have partner preference for women with anxious attachment, as supported by the study of Zayas and Shoda (2007) showing that men with perpetration experiences had a preference for women with an anxious attachment style. The first possibility explains victimization inflicted by known people, but does not justify victimization by unknown people, such as sexual victimization occurring in the context of sex with a stranger. Furthermore, based on our findings, anxious attachment seems to be linked torevictimization through maladaptive coping strategies including peritraumatic dissociation and risky sex behavior as well as feelings of loneliness. This evidence clarifies the findings of prior research by providing information on potential mechanisms by which insecure attachment increases the subsequent risk of revictimization through other mechanisms.

4.2.2. Early maladaptive schemas

The pathways consisting of attachment styles and schema domains show potential developmental trajectories of revictimization. Based on Young's Schema Theory (Young et al., 2003), individuals have various emotional needs such as secure attachment. Early life experiences, such as CM, hinder meeting of these basic psychological needs and influence the way people see others and themselves. Therefore, it is assumed that CM fosters insecure attachment, destructive cognitive and emotional patterns through which people (mis)interpret their self-worth and others' behaviors.

The pathways from CM severity to anxious attachment and then to

the three schema domains support Young's theory (Young et al., 2003). In one pathway, CM severity was associated with higher anxious attachment, which led to the schemas of other-directedness (with themes of dependence on others, and prioritizing others' needs and feelings to receive approval and nurture). Our findings suggest that proximity seeking and dependence, derived from anxious attachment style and other-directedness schemas, could provoke negative emotions that seem to be managed by dissociation at the time of trauma (i.e., interpersonal victimization). This process makes a person more vulnerable to further victimization since peritraumatic dissociation limits access to information related to threatening signals in previous trauma; information that can be used to prevent victimization in similar situations in the future (Chu, 1992; Irwin, 1999).

Two other pathways through which anxious attachment was linked to revictimization consisted of both rejection and impaired autonomy domains, which were linked to emotion dysregulation and then to PTSD. These pathways imply that the rejection domain (with the themes of lack of reliable support and connection, mistrust, and low self-worth) and impaired autonomy (with the themes of dependence on and enmeshment with others), derived from an insecure attachment, might result in difficulties to regulate negative emotions (i.e., limited access to emotion regulation strategies) and developing PTSD, which is a subsequent risk factor for revictimization. Supporting the development of emotion dysregulation due to these schemas, Young et al. (2003) assume that people use maladaptive coping to deal with negative schemas that maintain these schemas. For instance, one might avoid all triggers that activate the schemas, a coping mechanism that prevents people from acquiring skills that help them regulate their negative emotions. The association between insecure attachment and early maladaptive schemas (Platts et al., 2005; Simard et al., 2011), insecure attachment styles and emotion dysregulation (Oshri et al., 2015; Parada-Fernández et al., 2021), and between PTSD and emotion dysregulation (Pencea et al., 2020; Powers et al., 2015; Weiss et al., 2013) are consistent with findings from previous studies. These interpretations about the temporal order of the risk factors should be interpreted with caution since these findings are based on cross-sectional data.

4.2.3. Meaning in life

One pathway in the model implied that CM severity decreases perceived meaning in life, (i.e., cognitions about coherence of life experiences, having life's goals, and considering one's life as important; George and Park, 2016), which limits access to strategies for regulating negative emotions. This, in turn, is related to increases in PTSD symptoms and then an increased risk for revictimization. This finding can be interpreted in the context of Shattered Assumptions Theory (Janoff-Bulman, 1985), proposing that negative early life experiences, including CM, shake people's view of self, others, and the world. Based on our findings, CM might shatter basic assumptions about the self (invulnerable, worthy), and the world (word as comprehensible, orderly and predictable), which in turn can challenge the perceived meaning in life of these victims (Janoff-Bulman, 1985).

The pathway from meaning in life to limited access to emotion regulation strategies is consistent with a prospective study that predicted poorer emotion regulation from diminished meaning-making in the context of life events (Cox and McAdams, 2014).

4.2.4. Drug use

One pathway in the model clarified how drug use might increase the chance of revictimization through risky sex behavior, but this path might be most relevant for sexual victimization. It is crucial to understand the mechanism through which drug use leads to specific types of revictimization. The mechanism(s) linking drug abuse and risky sex behavior is not well-tested. Considering the high rate of drug use among university students in social gatherings (Bennett and Holloway, 2017; Nichter et al., 2010), this factor might lead to revictimization by increased exposure to potential perpetrators in such settings, especially when both parties (i.e., victims and potential perpetrators) might be under the influence of drugs.

4.2.5. Peritraumatic Dissociation

Our model also suggests a pathway that might explain how peritraumatic dissociation functions as a risk factor for revictimization. It seems that peritraumatic dissociation increases PTSD symptoms (a link that was also previously supported; Breh and Seidler, 2007; Lensvelt-Mulders et al., 2008), which in turn are related to using sexual activity as an emotion regulation strategy. Then, people with such a tendency are more likely to engage in risky sex behavior increasing the likelihood of (sexual) revictimization. A literature review provided support for the link between PTSD and maladaptive emotion regulation strategies, such as substance use and disordered eating (Messman-Moore and Bhuptani, 2017); strategies that are probably used to deal with overwhelming trauma-related symptoms. Although research on sex motives is limited to only a few studies, this factor is shown to be related to risky sex behavior and (sexual) revictimization (Fereidooni et al., 2022; Miron and Orcutt, 2014), but the observed indirect association with peritraumatic dissociation has not yet been reported elsewhere.

4.2.6. Mediators functioning as networks

The variables that were central in our study, such as anxious attachment, PTSD symptoms, and loneliness, might be those factors that play the most important roles in revictimization since they had critical roles in connecting other risk factors. Therefore, they might be important targets in prevention programs. This assumption can direct future research on the effectiveness of interventions on revictimization. To elaborate, it needs to be examined if focusing on insecure attachment, PTSD symptoms, and loneliness in prevention programs significantly decreases the risk of revictimization among CM survivors.

4.2.7. Factors without observed mediating effects

We did not find support for the effects of specific risky sex behaviors (i.e., sex with strangers, a high number of sexual partners, and sexual assertiveness) given all other factors in the model. The small numbers related to the frequency of sex with strangers and the number of sexual partners (between one and two on average), in the current sample might explain these findings. In addition, having different forms of adulthood victimization might explain the results since risky sex behaviors are more specific to sexual victimization. The absence of an association between sexual sensation seeking and CM severity in the present model is in line with traumatic sexualization theory that proposes that sex is used for non-sexual goals, such as attention or approval seeking, in people with a history of childhood sexual abuse (Finkelhor and Browne, 1985). Sexual sensation seeking is more focused on sexual pleasure, which might not be the main aim of sexual engagement for people with a history of sexual abuse in childhood based on this theory.

Findings regarding somatoform dissociation are similar to another study (Dietrich, 2007). Although it is very early to reach any conclusion about this variable due to the scarcity of evidence, this factor might not be related to revictimization because manifesting dissociative symptoms through the body might not increase exposure to potential perpetrators or victims' vulnerability. Furthermore, peritraumatic (psychological) dissociation which was a first-order mediator might be better suited to test the association between dissociation and revictimization.

Coping was defined as using strategies such as wishful thinking and self-blame. Unlike previous studies that provided evidence on the association between coping strategies and revictimization (Arata, 1999; Gibson and Leitenberg, 2001; Mayall and Gold, 1995), we did not find such an association. Other concepts related to coping, namely using sex to reduce negative affect, and limited access to emotion regulation strategies, might be better in explaining the association between strategies used for dealing with negative emotional states and revictimization. They represent factors at the behavioral level, such as involvement in sexual activity, or using a passive approach towards emotions, like

wallowing in negative emotions, that could directly increase the risk of further victimization, while wishful thinking or self-blame might not have such a proximate effect on revictimization. This hypothesis applies to null findings on the role of distress intolerance too.

4.3. Revictimization model at a glance

Taking a broader perspective on the model, three important observations stand out. First, it seems that the relationship between childhood maltreatment and revictimization is not straightforward. In other words, a combination of factors, each with small effects, contribute to the increased risk of revictimization among survivors of childhood maltreatment. This suggests that a handful of factors, as included in the models in previous studies, would miss the complexity of revictimization and fail to represent most of the relevant factors. Second, a large number of pathways with a combination of various factors in the model points to potential individual differences in risk factors for revictimization. Third, although we assumed that we would find some factors and pathways with the strongest effects on revictimization, our results show that the contribution of all pathways/risk factors are equally small. Nevertheless, some factors that functioned as networks might be more influential in revictimization since they connect other risk factors. Fourth, the variables more proximal to CM were cognitive factors and/or patterns about the self and others (insecure attachment and negative schemas), while the variables positioned in the middle of the model were related to emotional domains, such as emotion dysregulation and reactivity. Variables pointing towards adulthood victimization at the bottom of the model referred to the behavioral level, such as drug use and risky sex behavior. Therefore, the model indicates that CM may result in the development of cognitive patterns that elicit emotional difficulties, for which people might then rely on maladaptive coping strategies that may potentially lead to revictimization. Moreover, the paths from CM to the proximal variables had higher beta coefficients compared to the ones proximal to adulthood victimization. It can be concluded that the adverse effects following CM are more predictable compared to victimization in adulthood.

Small effects found in the models of revictimization tested in prior studies, particularly the beta coefficients corresponding to the paths towards victimization in adulthood (Gay et al., 2013; Hocking et al., 2016) are comparable to our results, further underscoring the complexity of predicting revictimization. In summary, the involvement of various factors, interrelations between them, and individual variability in the risk factors might explain small effect sizes (values between 005 and 0.01) related to pathways corresponding to first and second-order mediators. To further investigate potential reasons behind the differences between the results of this study and prior research, we compared the rates of CM, adulthood victimization, and revictimization in the current sample with previous samples. The rates of childhood sexual, physical and emotional abuse in the present study were within the confidence intervals of a meta-analysis reviewing studies on the prevalence of CM in Europe. However, physical neglect had a higher prevalence in our study (Mayall and Gold, 1995). In terms of adulthood victimization, the rate of physical violence in our study was significantly lower than in a study in European countries (European Union Agency for Fundamental Rights, 2014), while the rate of sexual victimization in our study was higher. The minor discrepancies in the frequencies of the various forms of adulthood victimization between these two studies might be explained by differences in the age range and nationalities of included participants. Since evidence shows the differential effects of different types of CM on revictimization (Dias et al., 2017; Gama et al., 2021; Messing et al., 2012), the differences in the rates of CM and adulthood victimization in our study might explain discrepancies between our results and prior research. Nevertheless, comparable to previous studies (Arata, 2002; Jankowski et al., 2002; Van Bruggen et al., 2006), people with a history of CM were approximately three times more likely to be revictimized than people without such an experience in our sample.

4.4. Clinical implications

The involvement of various factors highlights the importance of interventions at different levels (cognitive, behavioral, and emotional). In addition, it seems that changes at behavioral levels (i.e., reducing risky behavior such as sexual-risk taking and drug use) requires interventions at cognitive and emotional levels. For instance, interventions on early maldaptive schemas might decrease vulnerability to revictimization by reducing PTSD symptoms, emotion dysregulation, and consequently sexual risk-taking. No study has investigated the effectiveness of interventions on such schemas yet. A single case series study with a small sample size ($N = 6$) on people with lifetime history of sexual abuse showed that PTSD and depression symptoms significantly reduced following Schema Therapy (Korkmaz, & Soygut, 2023). Furthermore, to address sexual-risk taking, it is important to explore the motives behind such behaviors. The involvement of various combinations of variables and interrelations between them imply that a comprehensive assessment of risk factors is crucial to design an intervention tailored properly to a specific individual.

As discussed above, interventions on networking factors (i.e., anxious attachment, meaning in life, rejection and impaired autonomy domains, PTSD symptoms, and loneliness) might mitigate the risk of revictimization as well, since these factors seem to connect other factors. In a similar vein, since the model indicates that childhood maltreatment is linked to disruptions in emotion dysregulation, interventions focused on emotion regulation such as Dialectical Behavior Therapy (Linehan, 2018) could be potentially effective, a hypothesis that needs to be tested in future research. In line with this assumption, a review conducted on the effects of childhood maltreatment on PTSD and its comorbidities, such as substance use disorder and eating disorders concluded that emotion regulation might be a "coalescent factor in the nexus of child maltreatment, PTSD, and other comorbidities" (Messman-Moore and Bhuptani, 2017), thus might require close attention in prevention programs for the survivors of childhood maltreatment.

4.5. Strengths

To our knowledge, this is the first study testing a model with various intrapersonal risk factors, allowing interrelations between them, using a (partially) data-driven approach. The comprehensive model, the largest model tested to date, displays how the interactions between cognitive, emotional and behavioral factors increase the risk of revictimization among CM-survivors and indicates the complexity of the phenomenon. In addition, the vast majority of the variables had large sample sizes. Another strength is that most available models focus exclusively on sexual revictimization, while we took a broader approach in our model in terms of forms of victimization in childhood and adulthood, which can be specified for different forms of revictimization in the future. Unlike most previous studies conducted in universities in the US (Walker and Wamser-Nanney, 2023), we recruited a sample predominantly German and Dutch as well as other nationalities. Furthermore, to deal with the missing values, analyses were conducted based on full information maximum likelihood estimation, which uses all available data of both measures to determine coefficients between pairs of variables. Moreover, for the final pathway model, a good model fit was obtained, and no evidence was found suggesting that model assumptions were not reasonable.

4.6. Limitations and directions for future research

The findings of the present study need to be considered in light of several limitations. First, the cross-sectional nature of the study does not allow any firm conclusions regarding the directions of the relationships that were observed in our SEM-model(s). It is important to note that since our model is based on cross-sectional data, the directions of the pathways that are implied by our model need to be interpreted with

caution especially so in the face of studies suggesting that proposed risk factors such as depression not only heighten the chance of revictimization, but that (re)vicitimization may also increase the severity of the risk factors (such as depression) (e.g., Miron and Orcutt, 2014). The interpretation of the proposed direction that followed from our model may require even more caution because some of the candidate mediators were assessed during a later session than revictimization. Although the time-interval between the sessions was relatively modest, it cannot be ruled out that the measures of the proposed "mediators" were affected by the earlier experience of revictimization. To preclude this limitation, it would have been best if all the measures would have been administered during a single session. However, unfortunately this was not feasible given the high number of measures that needed to be included in light of the aim of our study. An important next step is to extend the current approach by including prospective data that allows for testing the proposed mediational pathways and clarifying the effects of revictimization on the candidate mediators. An important next step is to extend the current approach by including prospective data that allows for testing the proposed mediational pathways and clarifying the effects of revictimization on the candidate mediators. Second, although examining revictimization in female university students is relevant considering the high rates of adulthood victimization observed in this specific population (Clodfelter et al., 2008; Humphrey and White, 2000), the findings of the current research might not apply to populations including community and clinical samples, older populations, and men. Third, as discussed above, only intrapersonal factors were included in our model, while there is evidence that factors at the interpersonal level, such as partner selection (Gobin, 2012; Zayas and Shoda, 2007) and victim selection from the side of perpetrators might also influence the risk of revictimization (Book et al., 2013; Ritchie et al., 2019; Wheeler et al., 2009). In addition, Ecological System Theory suggests that factors at exosystem levels, such as neighborhood (e.g., areas with greater social and economic challenges), and macrosystem levels, such as societal values (e.g., victim-blaming) can increase the risk of revictimization (Grauerholz, 2000). In line with this theory, previous research showed that lower community cohesion (the extent to which a community communicates and provides support for its members; Obasaju et al., 2008) as well as factors at macrosystem level, like traditional gender roles (Herrero et al., 2018) are related to victimization, however, these factors were not included in the current model. The observed direct association between CM severity and adulthood victimization implies that the model misses some potential contributing factors. This points to the importance of the inclusion of factors at the exosystem-level in future research. Another possible explanation for the direct relationship between childhood maltreatment and adulthood victimization is the imperfect reliability of the measurements of the variables in the model. Fourth, the model does not distinguish between different types of victimization in childhood and adulthood, while it might well be that the relevance of particular risk factors may vary across the various forms of revictimization. Further research with larger samples that allow for testing separate models for different types of revictimization would be important to get more detailed insight into factors involved in various types of revictimization. Although the current sample size was quite substantial, it was only just sufficient for estimation of a model with the current number of pathways/variables. Furthermore, since different forms of childhood maltreatment were associated with a heightened risk for all forms of adulthood victimization in the current study, it would be interesting for future research to examine if there may be differences in the prognostic power of the various forms of childhood maltreatment for different forms of adulthood victimization. Fifth, the sexual orientation of participants was not assessed. It might be an important factor in revictimization since previous studies showed higher rates of cyberbullying (Zerach, 2016), childhood sexual abuse, and sexual revictimization in homosexual women compared to their heterosexual peers (Hughes et al., 2010). The same limitation applies to non-binary populations showing higher risk of victimization compared to binary individuals (Newcomb et al., 2020; Hammarström et al., 2022). Sixth, the included variables had different sample sizes in the current study, which could potentially affect the power of variables with smaller sample sizes. Seventh, our approach to building the current model was to start with the null model, followed by creating the starting model, using MIs to obtain the final model, and selecting mediators with logistic regression and t-tests to make the final model more parsimonious. This approach was chosen to develop a data-driven model. However, one can argue that using different approaches might have led to different models and conclusions. Moreover, we used available data and theories in our selection of the variables included in the model and for some other decisions in the process of building the model (i.e., in some exceptional cases, we removed indexes from the model when these were fully inconsistent with the available literature and/or prevailing theories). As such, our approach may have biased our model by favoring prevailing theories/available data.

Another limitation of the current study is that we did not examine the factors differentiating between people with a history of childhood maltreatment who did versus those who did not experience revictimization. Future research using an individual-level approach such as exploring latent class analysis for these two groups might help identifying the potential differentiating factors. In addition, the percentage of missing values differed between revictimized and non-revictimized participants depending on the sites and measures due to drop-outs over the course of the study. These patterns of missing values might have biased the results because there were differences in the patterns of measures that were missing between revictimized and non-revictimized individuals. Finally, although we assumed that the included sites are quite similar (dominantly Caucasian and from first-developed countries) and representative of the general population of college students in such countries, it cannot be ruled out that there might also be meaningful differences between the sites with regard to particular variables that are relevant for explaining revictimization. Therefore, multi-group comparisons across the sites would help find potential differences. These comparisons were, however, not feasible in the current study because a larger sample size per site would be needed to estimate the model. Future studies with large sample sizes per site can address this limitation although recruiting such samples could be a challenge.

4.7. General conclusion

The current study indicates that PTSD symptoms, loneliness, and drug use might be among the most significant risk factors for revictimization albeit they all showed small effects. In addition, peritraumatic dissociation emerged as a first and second-order mediator and it functioned as a network in the model, which highlights the importance of this factor in revictimization. Therefore, considering these factors as the first targets in preventive interventions might enhance the efficacy of such programs. In addition, the general impression of the model is that childhood maltreatment severity is associated with anxious attachment style and early maladaptive schemas, general cognitive patterns used for processing information about the self and others. These cognitive patterns are in turn related to emotion dysregulation and emotional reactivity, factors that probably lead to intense negative emotions, while people with a history of childhood maltreatment have limited sources to regulate them adaptively. Therefore, CM-survivors may employ dysfunctional strategies such as drug use and risky sex behavior, increasing the risk of further victimization. It should be acknowledged that focusing on intrapersonal risk factors of revictimization does not imply that victims are responsible for the violence inflicted on them and it does not overlook the salience of interventions targeting perpetrators. However, understanding individual risk factors for revictimization can help us design effective programs with the aim of women's empowerment and help prevent/mitigate the consequences of CM.

Author statement

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Declaration of competing interest

The authors have no financial disclosures nor conflicts of interest to declare.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jpsychires.2023.10.007.

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