Research article

The independent effects of child sexual abuse and impulsivity on lifetime suicide attempts among female patients

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ABSTRACT

Child sexual abuse (CSA) is a causal agent in many negative adulthood outcomes, including the risk for life-threatening behaviors such as suicide ideation and suicide attempts. Traumatic events such as CSA may pose risk in the healthy development of cognitive and emotional functioning during childhood. In fact, high impulsivity, a risk factor for suicidal behavior, is characteristic of CSA victims. The current study aims to understand the relations among CSA, impulsivity, and frequency of lifetime suicide attempts among a female patient sample admitted for suicidal behavior. Participants included 177 female patients between the ages of 18 and 63 years admitted at two hospitals in Buenos Aires, Argentina. Number of previous suicide attempts and CSA were assessed via structured interviews, while impulsivity was assessed with the Barratt Impulsiveness Scale (BIS-11). A model of structural equations was employed to evaluate the role of impulsivity in the relation between CSA and suicide attempts. CSA (β = .18, p < .05) and impulsivity (β = .24, p < .05) were associated with the number of previous suicide attempts. However, impulsivity was not significantly associated with CSA (β = .09, p > .05). CSA and impulsivity are independently associated with lifetime suicide attempts among female patients with recent suicidal behavior.

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Child sexual abuse (CSA) is defined as the involvement of a child in sexual activity that he or she does not fully comprehend, is unable to give informed consent to or is not developmentally prepared and cannot give consent, or that violates the laws or social taboos of society. CSA is evidenced by this activity between a child and an adult, or another child who by age or development is in a relationship of responsibility, which is intended to gratify or satisfy the needs of the perpetrator. CSA may include but is not limited to: (i) the inducement or coercion of a child to engage in any unlawful sexual activity, (ii) the exploitative use of a child in prostitution or other unlawful sexual practices, and (iii) the exploitative use of children in pornographic performance and materials (WHO, 1999). CSA is indeed a serious worldwide public health concern (Barth,

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Bermetz, Heim, Trelle, & Tonia, 2013; Stoltenborgh, van Ijzendoorn, Euser, & Bakermans-Kranenburg, 2011). Data suggest 78–89% of CSA victims are women (Synder, 2000); approximately one in five adult women in the United States have a history of CSA (Tjaden & Thoennes, 1998).

CSA victimization increases the risk for numerous negative mental health outcomes, including depression (Dinwiddie et al., 2000; Putnam, 2003; Weiss, Longhurst, & Mazure, 1999), posttraumatic stress disorder (Duncan, Saunders, Kilpatrick, Hanson, & Resnick, 1996; Miller & Resick, 2007; Walsh et al., 2012), sexual risk-taking (Fergusson, Horwood, & Lynskey, 1997) and borderline personality disorder (Zanarini et al., 2002). Of particular concern are the high rates of suicidal ideation and suicide attempts among victims of CSA (Brodsky et al., 2001; Gladstone et al., 2004; Ullman & Brecklin, 2002). As noted in epidemiological research, CSA is a large risk factor of future suicidal behavior (Bebbington et al., 2009; Molnar, Berkman, & Buka, 2001). This strong association is also true for a variety of diverse samples (Afifi et al., 2016; Fergusson, McLeod, & Horwood, 2013; Lopez-Castroman et al., 2013; Rabinovitch, Kerr, Leve, & Chamberlain, 2015). For example, childhood trauma exposure, including CSA, significantly predicted suicidal ideation above and beyond the effects of combat exposure among United States military personnel and Veterans (Youssef et al., 2013). Longitudinal studies demonstrate how the effects of CSA are long lasting and increase risk for suicidal behavior (Trickett, Noll, & Putnam, 2011). Evidence also suggests the age of onset of CSA is associated with increased suicidal intent (Lopez-Castroman et al., 2013). Moreover, women with a history of CSA who attempt suicide are disproportionately vulnerable to repeated suicidal behavior as compared to women without a history of CSA (Dube et al., 2005; Ystgaard, Hestetun, Loeb, & Mehlum, 2004). Altogether, this data shows the association between CSA and suicide behavior.

Less clearly understood, however, are the mechanisms underlying the relation between CSA and suicidal behavior. It has been suggested that impulsivity may serve as one of the underlining mechanisms (Braquehais, Oquendo, Baca-Garcia, & Sher, 2010). Impulsivity comprises a wide spectrum of behaviors characterized by quick and nonplanned reaction to external or internal stimuli, without taking into account the possible negative consequences for the individual or others (Moeller, Barratt, Dougherty, Schmitz, & Swann, 2001). Impulsivity may be considered a personality trait, behavior, or state (i.e., impulsive action). Multiple theoretical models of suicide refer to impulsivity in attempt to explain suicidal behavior (Mann, Waternaux, Haas, & Malone, 1999; Van Orden et al., 2010). For example, a diathesis stress model of suicide would propose impulsivity, as a trait, predisposes an individual to engage in self-directed violence in response to suicidal thoughts (Mann et al., 1999). Consistent with Linehan's theory of suicide, pronounced impulsivity likely contributes to emotion regulation difficulties that may set the stage for suicidal crises (Crowell, Beauchaine, & Linehan, 2009). In fact, among individuals with borderline personality disorder, impulsivity is a robust predictor of suicide attempts (Brodsky, Malone, Ellis, Dulit, & Mann, 1997; Daray et al., 2015; Herpertz, Sass, & Favazza, 1997; Rebok et al., 2015; Soloff, Lis, Kelly, Cornelius, & Ulrich, 1994). The association between impulsivity and suicide attempts has been extensively observed in various adult psychiatric populations (Dougherty et al., 2004; Oquendo et al., 2004; Swann et al., 2005). Moreover, low serotonergic activity has been suggested as a common biologic substrate for both impulsivity and suicidal behavior (Roy & Linnoila, 1988) On the other hand, impulsivity has also been associated with CSA. Sexual abuse during childhood may lead to disruptions in executive functioning (Brodsky et al., 2001; Putnam, 2003). Impulse control is an executive function that typically develops well into adolescence (Leon-Carrion, Garcia-Orza, & Perez-Santamaria, 2004); therefore, adverse events occurring at any point in childhood may contribute to deleterious effects. Indeed, adults with a history of CSA show higher trait impulsivity and rates of suicide attempts as compared to adults without CSA history (Brodsky et al., 2001).

Given the relation among impulsivity, suicidal behavior and CSA, the current study aimed to examine the degree to which the relation between CSA and lifetime suicide attempts may be explained in part by impulsivity. To the best of our knowledge, this is the first exploratory study to focus on the role of impulsivity as a potential mediator between CSA and frequency of suicide attempts among patients hospitalized for a recent suicide attempt or active suicidal ideation. The two competing hypotheses were explored:

H1.   Consistent with theories suggesting adverse childhood events negatively impact neurodevelopmental functioning (Navalta, Polcari, Webster, Boghossian, & Teicher, 2006), impulsivity will mediate the association between CSA and number of prior suicide attempts in female psychiatric patients.

H2.   Consistent with the diathesis stress model that considers impulsivity a trait (Mann et al., 1999), impulsivity will be independent of CSA and will be positively associated with number of previous suicide attempts.

1. Method

1.1. Study design

The present study used a cross-sectional design to compare baseline data obtained as part of a larger study with female patients admitted for a suicide attempt or active suicidal ideation at the Emergency Departments of *Dr. Braulio A. Moyano Neuropsychiatric Hospital* and the *Hospital de Clínicas José de San Martín*. The Dr. Braulio A. Moyano hospital is a women's neuropsychiatric hospital. The Hospital de Clínicas José de San Martín is a general hospital with a service for psychiatric hospitalization. Both hospitals serve a large urban catchment area in Buenos Aires, Argentina and predominantly treat lower-income, uninsured patients.

Table 1
Socio-demographic characteristics of patient sample (*N* = 177).

	M (SD) or %	Range
Mean age (SD, range)	37.60 (11.68)	18–63
Relationship status, *N* (%)		
Single	38.4%	
Married/living with a partner	32.8%	
Divorced	25.4%	
Widowed	3.4%	
Years of education	10.79 (3.22)	
Occupation, *N* (%)		
Employed	32.6%	
Housewife	31.4%	
Unemployed	36.0%	
Clinical characteristics		
Major depression	49.0%	
Bipolar disorder	18.5%	
Schizophrenia and related disorders	18.0%	
Other	14.5%	
History of CSA	41.1%	
Age at first sexual abuse	8.5 (3.89)	4–17
Number of prior suicide attempt, raw data	4.7 (6.68)	1–60
Number of prior suicide attempt, group data	2.3 (1.87)	
Patients without history of suicide attempts	22.9%	

Note. CSA = childhood sexual abuse.

1.2. Participants

Participants were 177 female patients admitted to the emergency department for current suicidal ideation or a recent suicide attempt. All patients were between the ages of 18 and 65 years (*M* = 37.60; SD = 11.91). The majority of the sample identified as Argentine (88.2%), while other patients reported their country of origin as Peru (2.8%); Paraguay (2.2%), Bolivia (1.7%), Chile (1.1%), Columbia (1.1%), Brazil (.6%), Italy (.6%), and Ukraine (.6%). Overall, patients reported an average of 10.79 years (SD = 3.22) of completed education and 66 patients (38.8%) reported some degree of religious practice. Over one-third of the sample was married (32.8%) and currently employed (32.6%). Further clinical and demographic variables are presented in Table 1.

1.3. Procedure

All participants in the current study were female patients consecutively admitted at the Emergency Department during a 2-year period. Patients who were admitted for active suicidal ideation or a suicide attempt were interviewed. Interviews were conducted by three psychiatrists (FR, SP and LG) with at least 5 years of experience in clinical psychiatry. All psychiatrists also received training in the semi-structured interviews administered as part of the study protocol. Suicidal ideation was defined as any self-reported thought of engaging in suicide-related behavior. A suicide attempt was defined as a potentially self-injurious behavior with a nonfatal outcome, for which there was evidence (either explicit or implicit) that the person intended at some (nonzero) level to kill herself (Silverman, Berman, Sanddal, O'Carroll, & Joiner, 2007). Initial evaluation was performed to determine if patients met inclusion criteria: (a) age between 18 and 65 years, (b) admission for suicidal ideation or suicide attempt, and (c) provided written informed consent. Patients were excluded if: (a) unable to respond autonomously (i.e., due to sedative effects of medication or language limitations), (b) were transferred to another institution, or (c) had a profession related to mental health. Patients who met inclusion criteria were given a complete description of the study and invited to participate. Each patient who agreed to participate provided written informed consent. Of all the patients admitted to the Emergency Department during the study period, 27% (*N* = 196) were admitted for active suicidal ideation or suicide attempt and, therefore, were invited to participate in the present study. Within this group of patients, 10% (*n* = 19), did not meet the inclusion criteria, leaving 177 available patients. The Ethics Committee of both hospitals approved all study procedures.

1.4. Measures

Each patient underwent a semi-structured interview with a psychiatrist from the research team which included questions specific to clinical and demographic variables as described previously (Teti et al., 2014).

1.4.1. Patient history of suicidal behavior. Patient history of suicide attempts, age of first attempt, and hospitalizations due to suicidal thoughts and behavior were assessed during baseline evaluation. For the current study, number of past attempts was defined as 1, 2, 3, 4, or 5 and more.

1.4.2. Patient history of child sexual abuse. Patient history of child sexual abuse (CSA), defined as any sexual activity with a child, prior to the age of 18 years, where consent is not or cannot be given (Andrews, Corry, Slade, Issakidis, & Swanston, 2004; Berliner & Elliot, 2002), was also assessed during this interview. Sexual abuse was coded dichotomously as yes or no. Information regarding the age of sexual abuse onset, perpetrator, and duration of abuse were also gathered from interview data.

1.4.3. Psychopathology and psychological variables. Impulsivity was assessed with the Barratt Impulsiveness Scale (BIS-11) (Patton, Stanford, & Barratt, 1995). The reliability and validity properties of the Spanish version of the BIS-11 have been previously studied in an Argentine population, evidencing good psychometrics properties (Lopez, Cetkovich-Bakmas, Lischinsky, Alvarez Prado, & Torrente, 2012). The BIS-11 yields three second-order factor scores: attentional impulsiveness (i.e., intrusive thoughts and racing thoughts), motor impulsiveness (i.e., tendency to act on the spur of the moment and consistency of lifestyle) and nonplanning impulsiveness (i.e., difficulties with careful thinking and planning or enjoyment of challenging mental tasks), each with adequate internal reliability (alpha coefficients ranged between .79 and .83 for this sample).

1.5. Data analytic approach

Categorical measures are reported as frequencies or percentages, and compared with contingency tables (χ^2). Continuous measures are reported as means ± standard deviations (SD) and compared by ANOVA methods (*t*-test) or Wilcoxon rank-sum test (Mann–Whitney *U* statistic) for non-normally distributed continuous data. Two structural equation models were analyzed to test the presenting hypotheses specific to the role of impulsivity on the relation between CSA victimization and number of previous suicide attempts, while controlling for participant age. A factor representing impulsivity was created using the 3 subscales of the Barratt Impulsiveness Scale (justified by high correlation between the 3 subscales). Direct effects from CSA and suicide attempts were compared across the two models, one with and one without BIS as a mediator. The threshold for statistical significance was set at *p* < .05. Using G*Power, we estimated a sample size of at least 111 participants would be needed to detect a small to medium effect size of f^2 = .10 with α = .05 (2-tailed test) and power = .80. Statistical analyses were conducted using SPSS and AMOS v.22 software.

2. Results

Of the total sample, 72 patients (40.7%) reported a history of CSA, with an average age of onset of abuse at 8.50 years (SD = 3.89, range: 3–17). The average number of previous suicide attempts was 4.22 (SD = 5.16). Given previous suicide attempts had values of skewness and kurtosis suggesting a non-normal distribution, it was recoded as 1, 2, 3, 4, and 5 or more. Patients with a history of CSA (*M* = 2.65, SD = 1.86) had a higher number of previous suicide attempts as compared to patients who did not report a history of CSA (*M* = 1.92, SD = 1.82) (see Table 2). Being a victim of CSA was directly related to suicide attempts. There was a non-significant trend for CSA victims to report greater impulsivity on the BIS-11 total score as compared to non-victims.

To examine indirect effects, we first analyzed a structural model containing age and CSA as predictors and number of previous suicide attempts as the criterion variable (Table 3). Age was used as a covariate given the possible association between having lived longer and more suicide attempts. This model was saturated with 0 degrees of freedom and explained 4% of the variance in prior suicide attempts. CSA was a significant predictor of prior suicide attempts. Specifically, patients with a history of CSA reported .75 more prior suicide attempts than patients without a CSA history.

Next, a structural model that contained BIS as the mediator between age and CSA predictors and number of suicide attempts as the criterion variable was examined (Table 3, Fig. 1). The model showed good fit [χ^2 (6) = 6.20, *p* = .40; a value >.05 suggests the data are not significantly different from the hypothesized model], comparative fit index (CFI) = .996 (values >.95 indicate good fit), and root mean square error of approximation (RMSEA) = .014 (values <.05 indicate good fit). The

Table 2
Descriptive statistics of the variables studied in the abused and non-abused population.

	CSA (*n* = 72) M (SD)	No-CSA (*n* = 105) M (SD)	Statistical test
Barratt Impulsiveness Scale (BIS-11)			
Attention impulsivity	21.06 (3.77)	20.64 (3.62)	*t* (157) = −.70, *p* = .48
Motor impulsivity	26.81 (5.44)	25.61 (5.42)	*t* (158) = −1.37, *p* = .17
Non-planning impulsivity	29.46 (5.99)	27.90 (5.64)	*t* (158) = −1.68, *p* = .10
Total score	77.53 (11.40)	74.16 (10.67)	*t* (157) = −1.91, *p* = .06
Previous suicide attempts, group data	2.65 (1.86)	1.92 (1.82)	*t* (175) = −2.59, *p* = .01

Table 3

Output for direct and indirect structural models predicting prior suicide attempts from child sexual abuse and impulsivity.

Path	Standardized estimate	Estimate	S.E.	C.R.	p
Direct effects model					
CSA → suicide attempts	.197	.75	.283	2.64	.008
Age → suicide attempts	.034	.01	.012	.460	.645
Mediation model					
CSA → suicide attempts	.175	.67	.283	2.35	.019
CSA → impulsivity	.091	.49	.528	.93	.352
Impulsivity → suicide attempts	.235	.17	.076	2.18	.029
Age → suicide attempts	.085	.01	.012	1.10	.272
Age → impulsivity	−.215	−.05	.023	−2.16	.031

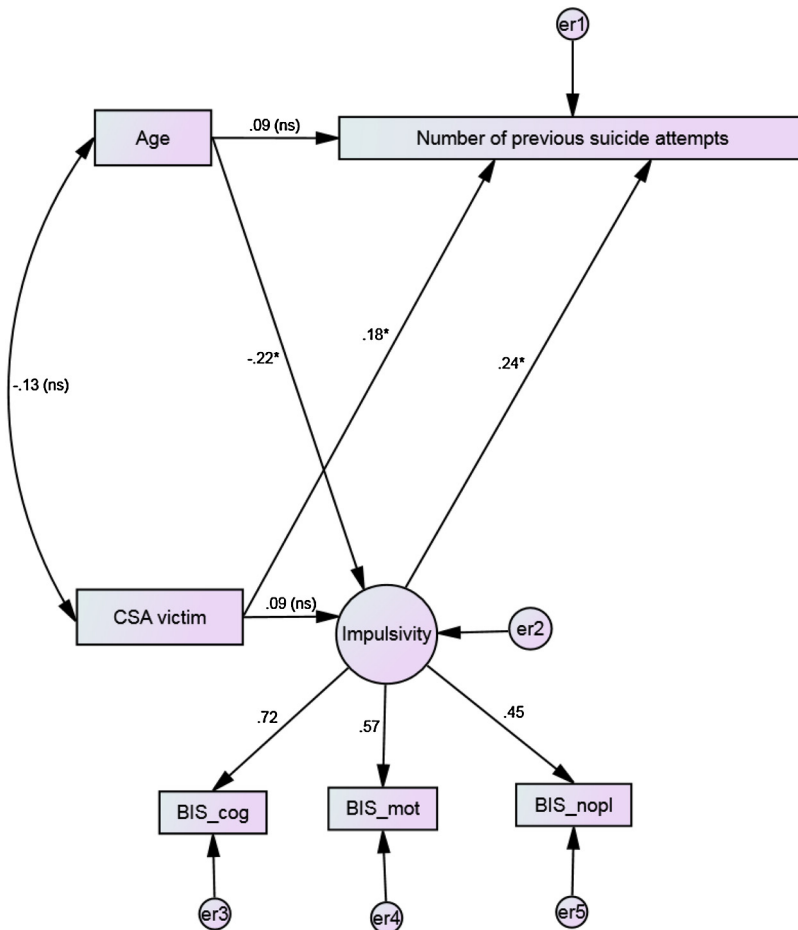*Note.* CSA = childhood sexual abuse; S.E. = standard error.

Fig. 1. A diagram of the direct and indirect effects model.

variables as a whole predicted 9% of the total variance in prior suicide attempts. In the model, being a victim of CSA remained directly related to number of previous suicide attempts. However, there was no evidence that impulsivity played a role in this relation (indirect β = .02). CSA victims presented an average of .67 more suicide attempts than non-victims (β = .18, p < .05). Also, greater impulsivity (BIS-11 factor score) was associated with more previous suicide attempts (β = .24, p < .05). After controlling for age and CSA history, every 1-point increase on the BIS-11 factor score was associated with a .17 increase of number of prior suicide attempts. Nonetheless, being a victim of childhood sexual abuse was not significantly associated with greater impulsivity (β = .09, p > .05).

3. Discussion

The present study aimed to understand the relation among CSA, impulsivity, and lifetime suicide attempts. Our main finding indicates that CSA and impulsivity are independently associated with an increased number of lifetime suicide attempts among female patients with acute suicidal ideation or a recent suicide attempt. Contrary to hypotheses, impulsivity did not account for the association between CSA and lifetime number of suicide attempts. Consistent with previous work (Briere & Zaidi, 1989), the prevalence of CSA history was high among female patients in this sample who were hospitalized for a recent suicide attempt or current suicidal ideation, and patients endorsing CSA reported a higher number of previous suicide attempts than patients without CSA history. This is important to consider given the high suicide risk of the overall sample. Patients endorsing CSA reported a greater number of previous suicide attempts as compared to patients without CSA history. Importantly, multiple suicide attempts are one of the most robust predictors of suicide (Brown, Beck, Steer, & Grisham, 2000). Findings suggest it may be important to screen for a history of CSA among patients with recent suicidal behavior. The many effects (e.g., biological, psychological) of CSA may in part explain the high suicide risk among CSA victims.

The current findings suggest a relation between impulsivity and lifetime suicide attempts, which is consistent with prior evidence (Brodsky et al., 1997; Corbitt, Malone, Haas, & Mann, 1996). Specifically, female patients with higher overall scores of impulsivity reported significantly more suicide attempts than patients with lower impulsivity scores. Several theories have been proposed to explain the relation between impulsivity and suicide behavior. For example, impulsivity may serve as the diathesis in a diathesis stress model in which stressors interact with impulsivity to increase risk for self-harm behavior (Mann et al., 1999). Furthermore, a deficit in serotonin neurotransmission has been proposed as a common neurobiological substrate for both impulsivity and suicide behavior (Roy & Linnoila, 1988). However, a recent systematic review and meta-analysis, suggests suicidal behavior is rarely, if ever, impulsive (Anestis, Soberay, Gutierrez, Hernandez, & Joiner, 2014), and propose that trait impulsivity is best regarded as one of the many distal factors instead of a direct risk factor. Based on the interpersonal-psychological theory of suicidal behavior, it is suggested that impulsive individuals become vulnerable to suicidal behavior over time due to the nature of experiences they tend to encounter as compared to non-impulsive individuals (Anestis et al., 2014). Future studies employing different measures or methodologies to assess impulsivity may help explain the discrepancies between theories.

It has been suggested that CSA can alter executive functions, resulting in impulsive traits (Braquehais et al., 2010). Therefore we analyzed if impulsivity acts as a mediator between CSA victimization and lifetime suicide attempts. Contrary to our hypothesis, results suggest impulsivity did not mediate the relation between CSA and lifetime suicide attempts in our sample. Although contrary to previous predictions (Braquehais et al., 2010), the current findings are consistent with previous work, among patients with major depressive disorder, indicating childhood abuse history is associated with suicidal behavior and impulsivity (Brodsky et al., 2001), The association between suicide behavior and child abuse was observed even after adjusting for impulsivity, suggesting childhood abuse and impulsivity have independent effects on suicidal behavior (Brodsky et al., 2001). Taken together, impulsivity may be an inherited trait underlying both CSA and suicidal behavior.

The present study adds previous findings (i.e., Brodsky et al., 2001) by observing similar findings in patients with multiple diagnoses. The current study sample included patients diagnosed with major depressive disorder (49%), bipolar disorder (18.5%) and schizophrenia (18%). The null findings specific to the mediator effect of impulsivity may also be explained by the characteristics of the study sample. The study sample included severely ill patients hospitalized for recent suicidal behavior or acute suicidal ideation. Our sample also reported with high levels of impulsivity. It is possible that impulse control in the context of high emotional distress may be more strongly associated with CSA experiences than cognitive control in more neutral contexts. Therefore, the present study should be replicated with other samples (e.g. community or epidemiological) to further understand whether and how impulsivity plays a role in the relation between CSA and frequency of suicide attempts.

The current study contains limitations that should be considered when interpreting the findings. First, results are based on observational, cross-sectional data; therefore, causal relationships cannot be inferred. Second, given the way impulsivity was assessed in the current study, self-report of trait-like characteristics are absent of specific contexts. Future work may benefit from using more behavioral measures of impulsivity (e.g., delay discounting tasks) among suicidal victims of CSA. Also, only one aspect of executive functioning was measured. More comprehensive measures may be included in future studies. Thirdly, CSA history was measured via a semi-structured retrospective interview, which may be more vulnerable to bias as compared to a validated scale. However, previous studies have demonstrated high agreement between a series of similar semi-structured screening questions and validated scales for CSA (Brodsky et al., 2008). Finally, the generalizability of findings is limited to a female sample admitted to an emergency department due to recent suicidal behavior or active suicidal ideation.

The current findings indicate CSA and impulsivity are associated with an increased number of lifetime suicide attempts among female patients presenting to an emergency department with a suicide attempt or active suicidal ideation. These variables appear to have an independent effect. The fact that impulsivity does not act as a mediator in the relation between CSA and suicide attempts suggests impulsivity may be an inherited trait underlying both CSA and suicide attempts. However, finding may be also be due to the unique nature of the sample (e.g., high risk for suicide). Replication is needed with alternative samples. The current findings also provide evidence of the high rates (42%) of CSA among suicidal female patients admitted at emergency departments in Argentina. These high rates of CSA suggest it is important to assess for childhood traumatic events in patients seeking treatment for suicidal behavior. Also, the independent effects of impulsivity should be taken into

account. In the context of conducting suicide risk assessments, clinicians should consider not only traumatic experiences clients may report from their childhood, but also clients' abilities to control impulses.

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Conflict of interest

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