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SELF-CRITICISM AND DEPRESSIVE SYMPTOMS MEDIATE THE RELATIONSHIP BETWEEN EMOTIONAL EXPERIENCES WITH FAMILY AND PEERS AND SELF-INJURY IN ADOLESCENCE

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ABSTRACT

Although the relationship between negative childhood experiences, peer victimization, depressive symptoms and Non-Suicidal Self-Injury (NSSI) is widely recognized, the mechanisms involved are not fully understood, especially among adolescents. This study aims to test the mediating role of both self-criticism and depressive symptoms in the relationship between memories of negative or positive experiences, current peer victimization and NSSI. The sample consists 854 Portuguese adolescents, 451 female and 403 male, with ages between 12 and 18 years (M = 14.89; SD = 1.79), from middle and secondary schools. Participants answered self-report measures. Results from path analysis showed that memories of negative experiences, the absence of positive memories with family in childhood and peer victimization indirectly impact on NSSI through self-criticism and depressive symptoms. In addition, these stressful experiences led to depressive symptoms through self-criticism. Lastly, the most severe form of self-criticism indirectly impacts on NSSI through depressive symptoms, even though it also has a strong direct effect. It suggests that negative experiences with parents and peer victimization, as well as the absence of positive memories with family, have a negative impact on NSSI when these experiences are linked with a sense of self-hatred and depressive symptoms.

Keywords: Adolescence; Depression; Non-suicidal self-injury (NSSI); Peer victimization; Self-criticism.

INTRODUCTION

Non-suicidal self-injury (NSSI) is defined as the deliberate and direct destruction of body tissue without suicidal intent for purposes not socially sanctioned (American Psychiatric Association, 2013). NSSI commonly occurs during adolescence with dramatically high prevalence rates in community samples (10-40%; Giletta, Scholte, Engels, Ciairano, & Prinstein, 2012; Klonsky, Muehlenkamp, Lewis, & Walsh, 2011). Besides its elevated occurrence in adolescence (e.g., Giletta et al., 2012), NSSI is associated with several psychopathological indicators and increased risk for future suicide (Klonsky, May, & Glenn, 2013). Both the high prevalence of NSSI and its associated consequences in adolescence have been accounted in several studies in different countries (e.g., U.S.A, European countries, China), suggesting that NSSI is a cross-cultural phenomenon (Barrocas, Giletta, Hankin, Prinstein & Abela, 2015; Giletta et al., 2012; Muehlenkamp, Claes, Haventarpe & Plener, 2012). In Portugal, although studies on NSSI are scarce, some have reported similar prevalence rates (e.g., Xavier, Cunha, & Pinto-Gouveia, 2015).

A growing body of research has consistently supported the impact of adverse childhood experiences in the etiology of NSSI, including invalidating environments, sexual and physical abuse, neglect and parental conflicts (Kaess et al., 2013; Klonsky et al., 2011). As far as we know, fewer studies have explored the possible mechanisms underlying the associations between adverse childhood experiences and NSSI. For instance, Glassman, Weierich, Hooley, Deliberto and Nock (2007) found that the impact of emotional abuse on engagement in NSSI during adolescence (12–19 years old) is mediated by the presence of self-criticism. Another study conducted in a large sample of college students showed that emotion regulation difficulties may explain the relationship between physical and sexual abuse subtypes and NSSI (Muehlenkamp, Kerr, Brandley, & Larsen, 2010).

However, the recall of how one felt in relation to parents' behaviors, more than the recall of parental actual behavior, seems to play a relevant role on psychological mal-adjustment (Gilbert, Cheung, Grandfield, Campey, & Irons, 2003; Irons, Gilbert, Baldwin, Baccus, & Palmer, 2006; Pinto-Gouveia, Xavier, & Cunha, 2016). Memories of feeling rejected, threatened, subordinated and devalued are some of the most powerful elicitors of stress responses and are linked to self-criticism and depression (Gilbert et al., 2003; Irons et al., 2006). In a recent cross-sectional study among a community adolescent sample (N = 441; 13–18 years old), the recall of threatening, submissiveness and devaluation feelings within one´s family were associated with NSSI through negative emotional states and these associations were amplified by daily peer hassles (Xavier, Cunha, & Pinto-Gouveia, 2016a). However, the role of self-hatred in the relationship between negative backgrounds and NSSI was not accounted for. In contrast,

memories of being valued, cared for and supported by parents are regulators of physiological and emotional systems and are associated with the ability to self-reassure (Richter, Gilbert, & McEwan, 2009). Such memories may become the basis for representations of others and of the self that influence emotional and social response to events (Mikulincer & Shaver, 2005).

In the context of difficult situations or failure in important life tasks, individuals may engage in an internal shaming process as an attempt to reduce the emotional arousal associated with the perceived failure or conflict situations, which is known as self-criticism (Gilbert, 2000; Gilbert & Irons, 2009). Self-criticism could take different forms and functions (Gilbert, Clarke, Hempel, Miles, & Irons, 2004). The form of self-criticism that is known to be more pathological is the hated self, as it refers to a sense of disgust, hatred and anger, with the desire to persecute, punish and exclude the self (Gilbert et al., 2004). Studies showed that this pervasive form of self-criticism is associated with depressive symptoms (Castilho, Pinto-Gouveia, & Duarte, 2013; Gilbert et al., 2004) and NSSI (Gilbert et al., 2010; Xavier, Pinto-Gouveia, & Cunha, 2016b). Throughout early adolescence to adulthood, self-criticism constitutes a stable characteristic and contributes to the perpetuation of the vicious cycle between self-criticism and depression, especially in female adolescents (Shahar, Blatt, Zuroff, Kupermine, & Leadbeater, 2004).

Although the earliest precursors for psychopathological pathways are in more intimate and family relationships, peer group relationships, especially those involving bullying, also play a crucial role in adolescence. “Bullying, an often studied form of peer victimization, is a subtype of aggressive behaviour, in which an individual or group of individuals repeatedly attacks, humiliates, and/or excludes a relatively powerless person” (van Geel, Goemans, & Vedder, 2015, p. 364). Peer victimization has many adverse short- and long-term consequences, namely internalizing problems (e.g., depression and anxiety), psychosomatic symptoms, difficulties in academic performance and school attendance, isolation, feelings of loneliness, suicidal ideation, suicide attempts and NSSI (Hawker, & Boulton, 2000; Turner, Exum, Brame, & Holt, 2013; van Geel et al., 2015).

A meta-analysis review focused on non-clinical adolescent samples reveals that peer victimization constitutes an important risk factor for NSSI (van Geel et al., 2015). A two-wave longitudinal study conducted in a sample of 880 adolescents (13-15 years old) corroborated that peer victimization has a predictive effect on deliberate self-harm (Jutengren, Kerr, & Stattin, 2011). Moreover, two cross-sectional studies conducted by Hay and Meldrum (2010) and Claes, Luyckx, Baetens, Van de Ven, and Witteman (2015) found that the relationship between peer victimization and NSSI occurred through negative emotions and depressive symptoms among community adolescent samples. Another longitudinal study demonstrated that being victim of

bullying during early childhood increases risk of NSSI in late adolescence indirectly via depressive symptoms (Lereya et al., 2013).

According to theoretical conceptualizations, NSSI may emerge as an attempt to manage and regulate negative emotional states resulting from stressful external experiences (e.g., with family and peers), which diminishes or eliminates such intense emotional arousal, resulting in a temporary emotional relief. However, the long-term outcomes are the maintenance of increased levels of negative emotional states through negative reinforcement. This vicious cycle strengthens the association between negative emotional arousal and NSSI, such that NSSI becomes an automatic response to similar situations and is maintained in the future (Chapman, Gratz, & Brown, 2006; Klonsky et al., 2011; Nock, & Prinstein, 2005).

Although negative experiences with parents and peer victimization are associated with NSSI, the possible mechanisms through which they might lead to NSSI are not well understood in adolescence. Based on current conceptualizations of NSSI, the present study aims to test the sequential effects of recalled negative (threat, subordination and devaluation) and positive (warmth and safeness) feelings in childhood, as well as peer victimization on self-criticism, which in turn affects depressive symptoms, which lastly affects NSSI. Firstly, we hypothesized that the extent to which memories of negative or positive experiences during childhood with family, and current peer victimization impact on NSSI is through self-criticism and current depressive symptoms. Secondly, we hypothesized that the associations between early negative or positive memories and peer victimization and depressive symptoms would occur through self-criticism. Lastly, we expect that the most pathological form of self-criticism (i.e., hated self) influences NSSI both directly and indirectly through depressive symptoms.

Although the literature separately documents the role of adverse experiences in the development of depressive symptoms and NSSI, as far as we know, this is the first study to test an integrative model for NSSI in which multiple risk factors (experiences with parents and peers) and sequential mediators (self-criticism and depressive symptoms) are integrated. The key contribution of this study is to understand how emotional experiences with both parents and peer group can lead to the development of a negative self-view focused on criticism, disgust and hostility, which, in turn, increases depressive symptoms and then affect NSSI. These assumptions to be confirmed can provide valuable information for prevention and intervention programs in adolescence.

METHOD

Participants

The sample consists of 854 Portuguese adolescents from middle and secondary schools (7^{th}–12^{th} grade). Of these 403 are male (47.2%) and 451 are female (52.8%). Mean age was 14.89 (*SD* = 1.79), ranging between 12 and 18 years old. No gender differences were found for age, $t_{(852)} = 1.803$, $p = .072$, except for years of education, $t_{(852)} = 2.646$, $p = .008$. Female adolescents have more years of education (*M* = 9.59, *SD* = 1.69) than male adolescents (*M* = 9.29, *SD* = 1.62).

Measures

The **Early Life Experiences Scale (ELES;** Gilbert et al., 2003; Portuguese version for adolescents by Pinto-Gouveia, Xavier, & Cunha, 2016) assesses memories of personal feelings within one´s family, namely recall of feeling frightened, devalued and having to behave in a subordinate way. This scale comprises 15 items and each item is rated on a 5-point scale (1 = *completely untrue*; 5 = *very true*). The scale can be used as a single construct or as three separate subscales: Threat (e.g., "There was little I could do to control my parents' anger once they became angry."), Submissiveness (e.g., "I often had to go along with others even when I did not want to.") and (Un)valued (e.g., "I felt able to assert myself in my family." – reverse scored). Gilbert et al. (2003) found Cronbach's alphas of .89 for threat, .85 for submissiveness, .71 for (un)valued and .92 for the total score. Also, this scale showed adequate internal reliability among adolescents, with Cronbach's alphas of .77 for threat, .74 for submissiveness, .68 for (un)valued and .86 for the total score. In the current study only the total score was used and it presented an adequate internal reliability (α = .86).

The **Early Memories of Warmth and Safeness Scale (EMWSS;** Richter, Gilbert, & McEwan, 2009; Portuguese version for adolescents by Cunha, Xavier, Martinho, & Matos, 2014) is a 21-item scale and measures the recall of positive personal feelings, linked to experiences of safeness, contentment and warmth in childhood (e.g., "I felt that I was a cherished member of my family"). This scale is rated on a 5-point scale (0 = *no, never*; 4 = *yes, most of the time*). Richter et al. (2009) found a single factor solution and a high Cronbach's alpha of .97. In the adolescents' version of EMWSS the internal consistency was good (α = .95). The Cronbach's alpha of EMWSS in the current study was .97.

The **Peer Relations Questionnaire (PRQ**; Rigby & Slee, 1993; Portuguese version: Silva & Pinheiro, 2010) assesses three styles of personal relating with peers, as a bully, a victim, or in a prosocial manner. This 20-item scale includes 6 items representative of the tendency to bully others, 6 items measuring the tendency to be victimized by others, 4 items taping prosocial behavior and 4 items as filler. Each item is rated on a 4-point scale (1 = *never*; 4 = *often*), with

higher scores indicating greater frequencies in each behavioral tendency. These scales are factorially distinct and have adequate internal consistency (α > .70). In the current study, only the subscale of tendency to be victimized by others (e.g., "I get picked on by other kids.") was used and the internal consistency was adequate (α = .82).

The **Forms of self-criticizing/attacking and self-reassuring scale (FSCRS**; Gilbert, Clark, Hempel, Miles, & Irons, 2004; Portuguese version: Castilho, Pinto-Gouveia, & Duarte, 2013) is a 22-item self-report questionnaire that assess how critical/attacking or how supportive/reassuring individuals are when facing failures and difficult situations.
This scale comprises two forms of self-criticizing (inadequate self and hated self) and other attitude focused on the positive aspects of the self (reassured self). Each item is rated on a 5-point scale (0 = *not at all like me*; 4 = *extremely like me*). In the original study the Cronbach's alphas were .90 for inadequate self and .86 for both hated and reassured self. Also, the Portuguese version presented good internal consistency, ranging between .72 and .89 (Castilho et al., 2013). In the current study only the *hated self* subscale was used to captures self-disgust, self-dislike feelings and an aggressive desire to hurt or persecute the self (e.g., "I have become so angry with myself that I want to hurt or injure myself.") and it presented adequate internal reliability (α = .79).

The **Depression Anxiety and Stress Scales** (DASS-21; Lovibond & Lovibond, 1995; Portuguese version: Pais-Ribeiro, Honrado, & Leal, 2004) is a 21-item scale and assesses three dimensions of negative emotional symptoms: depression, anxiety and stress. The items are rated on a 4-point scale (0–3) during the last week. In the original study the subscales had high internal consistency (α = .91 for depression; α = .84 for anxiety; α = .90 for stress). In the current study only the depression subscale was used and presented good internal consistency (α = .90).

The **Risk-taking and Self-harm Inventory for Adolescents** (RTSHIA; Vrouva, Fonagy, Fearon, & Roussow, 2010; Portuguese version: Xavier, Cunha, Pinto-Gouveia, & Paiva, 2013) is a self-report questionnaire that measures simultaneously risk-taking and self-harm behaviors. In the current study only the Self-harm dimension was used to assess the frequency of self-injury behaviors (e.g., cutting, burning or biting). The items refers to *intentionally* self-injury behaviors and are rated on a 4-point scale (0 = *never*; 3 = *many times*), referring to the lifelong history. In the present study, items 32 and 33, which assess suicidal ideation and intent respectively, were not included in the overall sum of NSSI. In addition, before conducting the analyses fourteen respondents were excluded from data set because they reported both suicidal ideation and intent. Vrouva et al. (2010) found an excellent good internal consistency for self-harm dimension (α = .93). In the present study the self-harm dimension (15 items) presented adequate internal reliability (α = .87).

Procedure

We recruited the sample in middle and secondary schools from the central region of Portugal. Before the administration of the questionnaires, ethical approvals were obtained by the Portuguese Ministry of Education and the Commission for Data Protection. After ethics approvals, schools were contacted and both the Head Teacher and the parents were given informed written consent. The informed consent sheet also included the contact of the research center and of the principal investigator in order to clarify any question related to the study or how to get help. In addition, all adolescents enrolled in the study were fully informed about the goals of the study and the aspects of confidentiality. Adolescents agreed to participate and filled out voluntarily the instruments in the classroom in the presence of the teacher and the researcher. When necessary, clarification regarding the protocol was provided. Participants who did not want to participate or were not authorized by their parents to participate in this study were excluded and were given an academic task by the teacher in the classroom.

Data Analysis

We conducted all statistical analyses using PASW Software (Predictive Analytics Software, version 18, SPSS, Chicago, IL, USA) and Amos Software (Analysis of Moment Structures, version 18, Amos Development Corporation, Crawfordville, FL, USA).

We performed descriptive statistics to analyze demographic variables and means scores on all variables. Gender differences were tested using independent-samples *t*-tests (Field, 2013). In addition, we conducted a one-way independent ANOVA to compare means scores of variables in study among age and grade groups. The *post hoc* Tukey HSD procedure was performed because it is considered the most powerful test for controlling the Type I error. However, when the assumption of homogeneity of variances was violated, the Welch and Brown-Forsythe F-ratios were analyzed and the *post hoc* Games-Howell procedure was chosen because it is accurate when population variances are different (Field, 2013).

We performed Pearson product-moment correlation coefficients to explore the relationships between early experiences of threat, subordination and devaluation (ELES), early memories of warmth and safeness (EMWSS), peer victimization (PRQ), self-criticism (hated self subscale of FSCRS), depressive symptoms (subscale of DASS-21) and NSSI (measured by Self-harm dimension of RTSHIA).

We conducted *Path analysis* to estimate the presumed relations among variables in the proposed theoretical model. This technique from structural equation modelling (SEM) considers theoretical causal relations among variables that have already been hypothesized (Kline, 2005).

In the path model tested, it was examined whether memories of negative and positive experiences and peer victimization would impact upon the frequency of non-suicidal self-injury (NSSI), mediated by hated self and current depressive symptoms. In addition, it was tested whether memories of negative and positive experiences and peer victimization would impact upon depressive symptoms, mediated by hated self. Furthermore, in this path analysis it was also tested whether the effect of hated self on NSSI is mediated by depressive symptoms. Demographic variables were included in the model, namely sex (a dummy variable where 0 = male and 1 = female) because it is a significant predictor of NSSI, and age (continuous variable measured in years) in order to control its potential confounding effect. The Maximum Likelihood (ML) was used as the estimation method to test for the significance of all path coefficients in the model and to compute fit indexes statistics (Kline, 2005). The following goodness-of-fit indexes were used to evaluate overall model fit: Chi-square value and the associated degrees of freedom, Goodness of Fit Index (GFI ≥ .95, good), Comparative Fit Index (CFI ≥ .95, good), Tucker-Lewis Index (TLI ≥ .95, good), Root Mean Square Error of Approximation (RMSEA ≤ .05, good fit; ≤ .08, acceptable fit; ≥ .10, poor fit), with 90% confidence interval (CI) (Hu & Bentler, 1999). The significance of the direct, indirect and total effects was assessed by the Bootstrap resampling method. This procedure with 2000 Bootstrap samples was used to create 95% bias-corrected confidence intervals. The effects were considered as significantly different from zero ($p < .05$) if zero is outside of the upper and lower bounds of the 95% bias-corrected confidence interval (Hayes & Preacher, 2010; Kline, 2005).

RESULTS

Preliminary Data Analysis

Data were screened for univariate normality and there were no severe violations to normal distribution (|Sk| < 3 and |Ku| < 8–10; Kline, 2005, p. 50). To inspect for possible multivariate outliers Mahalanobis Distance squared (D^2) were used and some extreme observations were excluded. Missing data was handled by using maximum likelihood estimation available in AMOS software. Multicollinearity was examined by inspecting the tolerance and variance inflation factor (VIF < 5) and no multicollinearity problems were found among variables (Kline, 2005).

Descriptive Analyses

Table 1 shows descriptive statistics of each variable for the full sample and by gender. As can be seen in Table 1, female adolescents have significantly higher levels of self-criticism (hated self) and depressive symptoms than males. They also report more engagement in NSSI than males. The Cohen's d effect sizes were small (cf. Table 1).

Table 1

Means (M), standard deviations (SD), independent-samples t-test for gender differences and Cohen's d effect size (N = 854)

Variables	Total sample (*N* = 854)		Males (*n* = 403)		Females (*n* = 451)		*t(df)*	Cohen's *d*	*r*
	M	***SD***	***M***	***SD***	***M***	***SD***			
ELES	28.44	9.40	27.83	9.10	28.99	9.65	1.813 (852)	n/a	n/a
EMWSS	65.24	15.42	65.68	15.04	64.84	15.75	0.792 (852)	n/a	n/a
Peer victimization	6.75	2.18	6.89	2.35	6.62	2.01	1.798 (796.444)	n/a	n/a
Hated self	3.14	3.79	2.62	3.49	3.61	3.98	3.875 (851.663)***	-0.26	-0.13
Depression	4.19	4.58	3.39	4.26	4.91	4.74	4.925 (851.957)***	-0.34	-0.17
NSSI	2.55	4.52	1.79	3.77	3.24	4.99	4.820 (828.778)***	-0.33	-0.16

Note. ***$p < .001$. n/a = not applicable. ELES = Early Life Experiences Scale; EMWSS = Early Memories of Warmth and Safeness Scale; NSSI = Non-suicidal self-injury measured by the Risk-taking and Self-harm Inventory for Adolescents (RTSHIA).

Table 2 presents the means, standard deviations and one-way ANOVA's F by age and grade groups. Results for age groups showed significant differences for early positive memories, peer victimization, hated self and depressive symptoms. *Post hoc* comparisons using Tukey HSD test indicated that early adolescents (12–13 years old) recall significantly more positive feelings within family than middle (14–15 years old) and later adolescents (16–18 years old). Since the assumption of homogeneity of variance was compromised for peer victimization, hated self and depression scores (Levene´s test $p < .05$), the Welch's F and Brown-Forsythe's F were used, indicated that two or three age groups differ significantly on their mean scores of peer victimization, hated self and depressive symptoms (cf. Table 2). *Post hoc* comparisons using Games-Howell test demonstrated that adolescents aged 12 or 13 years old reported significantly higher peer victimization experiences than adolescents 16 to 18 years old. Middle adolescents (14–15 years old) had significantly higher levels of hated self than early adolescents (12–13 years old). Both middle and later adolescents (14–15 and 16–18 years old) reported significantly higher levels of depressive symptoms than early adolescents (12–13 years old). The effect sizes were small (cf. Table 2).

Table 2

Means (M), standard deviations (SD), one-way independent ANOVA with F-ratio and effect size (N = 854)

Age Groups	**12-13 (*n* = 248)**		**14-15 (*n* = 256)**		**16-18 (*n* = 350)**		***F(df)***	**Partial η^2**
	M	***SD***	***M***	***SD***	***M***	***SD***		
ELES	28.56	9.12	28.40	9.25	28.39	9.73	0.028 (2, 851)	n/a
EMWSS	68.19	13.93	64.34	15.53	63.81	16.08	6.555 (2, 851)***	.015
Peer victimization	7.21	2.61	6.72	2.14	6.45	1.78	8.208 (2, 495.786)*** 8.671 (2, 677.757)***	.021
Hated self	2.76	3.78	3.69	4.26	3.00	3.37	3.639 (2, 514.655)* 4.101 (2, 741.652)*	.010
Depression	2.93	4.05	4.38	4.81	4.95	4.58	16.749 (2, 541.513)*** 15.000 (2, 801.685)***	.034
NSSI	2.16	4.25	2.75	4.54	2.69	4.67	1.326 (2, 851)	n/a
Grade Groups	**7–8 (*n* = 302)**		**9–10 (*n* = 278)**		**11–12 (*n* = 274)**		***F(df)***	**Partial η^2**
	M	***SD***	***M***	***SD***	***M***	***SD***		
ELES	28.81	9.21	28.48	9.31	28.00	9.73	0.537 (2, 851)	n/a
EMWSS	66.84	14.41	63.85	16.41	64.88	15.63	2.846 (2, 851)	n/a
Peer victimization	7.21	2.62	6.58	1.91	6.42	1.78	9.165 (2, 563.094)*** 11.040 (2, 785.479)***	.025
Hated self	3.01	3.96	3.62	4.09	2.79	3.20	3.649 (2, 562.166)* 3.676 (2, 823.204)*	.009
Depression	3.01	4.02	4.77	4.87	4.91	4.61	17.850 (2, 555.420)*** 15.998 (2, 814.910)***	.037
NSSI	2.43	4.71	2.89	4.61	2.34	4.19	1.196 (2, 851)	n/a

Note. *$p \leq .05$. **$p \leq .01$. ***$p \leq .001$. n/a = not applicable. ELES = Early Life Experiences Scale; EMWSS = Early Memories of Warmth and Safeness Scale; NSSI = Non-suicidal self-injury measured by the Risk-taking and Self-harm Inventory for Adolescents (RTSHIA).

In regard to grade in school, results from one-way ANOVA's F showed significant differences in peer victimization, hated self and depression (cf. Table 2). *Post hoc* comparison using Games-Howell test indicated that adolescents from 7th-8th grade reported significantly more enrolment in peer victimization than adolescents from 9th–10th and 11th–12th grades. Adolescents from 9th-10th grade had significantly higher levels of hated self than adolescents from 11th–12th grades. Lastly, adolescents from 9th–10th and 11th–12th grades reported significantly higher levels of depressive symptoms than adolescents from 7th–8th grade. The effect sizes were small (cf. Table 2).

Correlations

Table 3 presents the Pearson product-moment correlations between all variables in the study. Results showed that early memories of threat, submissiveness and devaluation within family were significantly and negatively correlated with early memories of warmth and safeness. Such early negative memories had positive and moderate correlations with peer victimization, hated self and depressive symptoms. There was a significant and positive correlation between early negative memories and NSSI. In contrast, early memories of warmth and safeness within family were significantly and negatively correlated with peer victimization, hated self, depressive symptoms and NSSI. Peer victimization presented significant and lower correlations with hated self, depressive symptoms and NSSI. Hated self and depressive symptoms were significantly and moderately associated with NSSI.

Table 3

Correlations (Pearson product-moment) between all variables in study (N = 854)

	ELES	**EMWSS**	**Peer victimization**	**Hated self**	**Depression**
EMWSS	-.62	–			
Peer victimization	.41	-.33	–		
Hated self	.41	-.35	.32	–	
Depression	.40	-.42	.28	.56	–
NSSI	.38	-.33	.26	.58	.49

Note. All correlation coefficients are significant at $p < .001$. ELES = Early Life Experiences Scale; EMWSS = Early Memories of Warmth and Safeness Scale; NSSI = Non-suicidal self-injury measured by the Risk-taking and Self-harm Inventory for Adolescents

Path Analysis

Taking into account the previous results and the proposed hypotheses, a model was tested, in which memories of threat, submissiveness and devaluation, memories of warmth and safeness within family and peer victimization indirectly influence NSSI through their effect on hated self and depressive symptoms. In addition, in the same path model it was tested whether memories of threat, submissiveness and devaluation, memories of warmth and safeness within family and peer victimization indirectly affects depressive symptoms through hated self. Furthermore, it was tested whether the effect of hated self on NSSI occurs through depressive symptoms. In this path model demographic variables (i.e., sex, and age) were included to control their effect (i.e., drawing covariances among exogenous variables).

The theoretical model was tested through a saturated or just-identified model, which comprised 39 parameters. Since this is a saturated or just-identified model, its degrees of freedom are zero and the goodness-of-fit is perfect to the data. The following paths were not statistically significant: the direct effect of age on NSSI (b = –.004, SE = .071, Z = –0.049, p = .961, β = –.001); the direct effect of age on hated self (b = .035, SE = .066, Z = 0.532, p = .595, β = .02); the direct effect of peer victimization on NSSI (b = .063, SE =.064, Z = 0.980, p = .327, β = .03); the direct effect of early memories of warmth and safeness on NSSI (b = –.011, SE = .010, Z = –1.061, p = .289, β = –.038). These non-significant paths were sequentially removed, and the model, consisting of 35 parameters, was respecified and recalculated (Figure 1). This respecified model revealed an excellent model fit: $\chi^2_{(4)}$ = 2.586, p = .629, GFI = .999, CFI = 1.000, TLI = 1.006, RMSEA = 0.000, 90% CI [0.000, 0.042], p = .979. In the respecified model all paths were statistically significant, and the significance of indirect effects was further confirmed through bootstrap resampling method. The model accounted for 22% of hated self, 41% of depressive symptoms and 39% of NSSI variances (Figure 1).

Results showed a significant indirect effect of memories of threat, subordination and devaluation on NSSI (b_{ELES} = .14, 95% CI [0.086, 0.185], p = .001), even when other variables were controlled for. This indirect effect indicates that more negative memories are associated with NSSI through its effect on hated self and depression. Also, these memories of threat, subordination and devaluation had a direct effect on NSSI (β = .13). There was a significant and negative indirect effect of memories of warmth and safeness on NSSI (b_{EMWSS} = –.10, 95% CI [–0.147, –0.054], p = .001) through hated self and greater levels of depressive symptoms, even when covariates and predictor variables were controlled for. Similarly, peer victimization had an indirect effect on NSSI (b_{PRQ} = .11, 95% CI [0.064, 0.155], p = .001) through hated self and depressive symptoms, even when controlling other variables in the model. Results from this path analysis showed an indirect effect of memories of threat, subordination and devaluation on

depressive symptoms (b_{ELES} =.11, 95% CI [0.064, 0.152], p = .001) through hated self. Also, these negative memories had a direct effect on depressive symptoms (β = .09). On the contrary, higher levels of memories of warmth and safeness indirectly impact on lesser levels of depressive symptoms (b_{EMWSS} = –.059, 95% CI [–0.097, –0.025], p = .001) through diminished hated self. Such early memories of warmth and safeness in childhood also had a direct effect with a negative direction on depressive symptoms (β = –.16). There was an indirect effect of peer victimization on depressive symptoms (b_{PRQ} = .078, 95% CI [0.040, 0.121], p = .001) through hated self. Also, peer victimization presented a direct effect on depressive symptoms (β = .09). In addition, hated self had an indirect effect on NSSI ($b_{HatedSelf}$ =.085, 95% CI [0.050, 0.130], p = .001) through depressive symptoms. Also, this severe form of self-criticism had a strong direct effect on NSSI (β = .40). Regarding covariate variables, results demonstrated that sex had a significant indirect effect on NSSI (b_{sex}= .079, 95% CI [0.046, 0.112], p = .001) through its effect on hated self and depression, even when other variables in the model were controlled for. In addition, sex had a direct effect on NSSI (β = .07). Also, there was an indirect effect of sex on depression (b_{sex}= .053, 95% CI [0.027, 0.080], p = .001) through hated self. Lastly, age had an indirect effect on NSSI (b_{age} = .033, 95% CI = [0.019, 0.055], p = .001) through depressive symptoms.

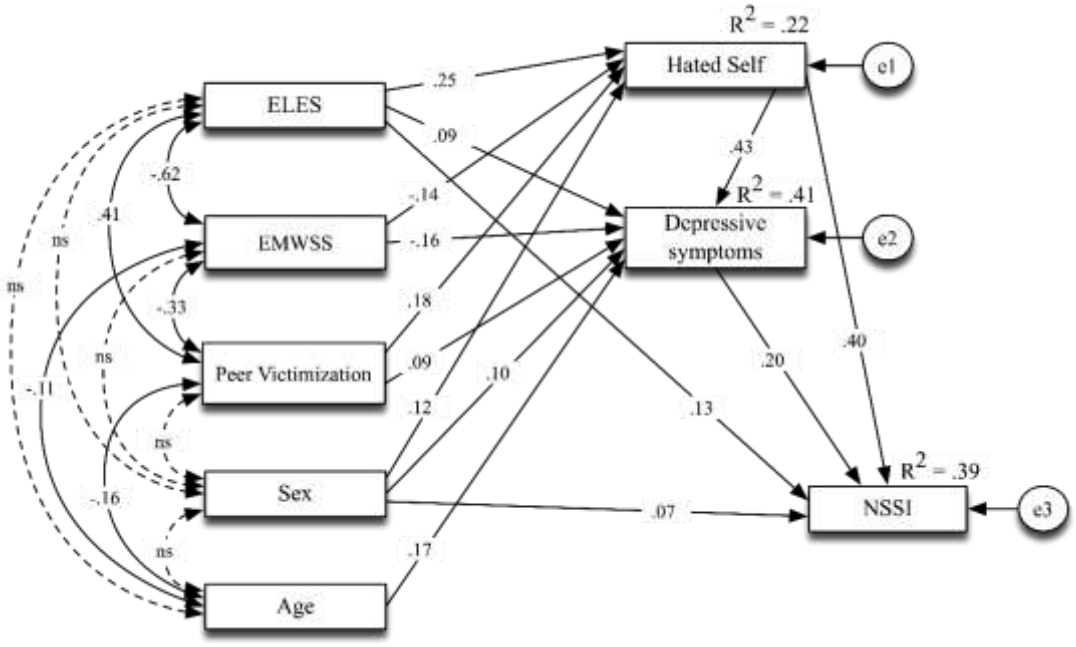

Figure 1. Path diagram for the final model explaining non-suicidal self-injury (NSSI) in the total sample (N = 854). ELES = Early Life Experiences Scale; EMWSS = Early Memories of Warmth and Safeness Scale. Model fit: $X^2_{(4)}$ = 2.586, p = .629, GFI = .999, CFI = 1.000, TLI = 1.006, RMSEA = 0.000, 90% CI [0.000, 0.042], p = .979. Standardized regression coefficients and squared multiple correlations (R^2) are presented; ns = non-significant correlations; the paths are statistically significant (p < .001).

DISCUSSION

The current study had the main goal of testing a hypothesized model in which memories of negative experiences with parents, current negative experiences with peers, as well as a lack of warm and affectionate memories with family predict NSSI through both self-criticism and current depressive symptoms.

In the present study, results from the descriptive analysis were in line with previous studies that suggest females are more vulnerable to experience internalizing symptoms than males (e.g., Turner et al., 2013; Xavier et al., 2016). In addition, current results suggest that during middle adolescence (14–15 years of age), individuals experience higher levels of self-hatred and depressive symptoms, when compared with early adolescence (12–13 years of age). Moreover, individuals in early adolescence seem to recall more experiences of warmth, safeness and affection with family when compared to middle and later adolescence (16–18 years of age). These results are consistent with previous studies in which early adolescents report being more protected and cared for in parental interactions than older adolescents (e.g., Cunha et al., 2014). However, our findings also indicate that individuals in early adolescence tend to report more victimization at the hands of peers when compared to individuals in later adolescence. These age trends have also been found by Scheithauer, Hayer, Petermann, and Jugert (2006).

The current study showed that adolescents who have more memories of threat, subordination and devaluation with their parents tend to have a sense of self as diminished, hated and devalued, tend to experience more depressive symptoms and tend to endorse more NSSI, which is in accordance with existent literature (e.g., Xavier et al., 2016a). On the other hand, our results show that adolescents who have fewer memories of warmth and safeness tend to experience higher levels of self-criticism, depressive symptoms and NSSI. This seems to suggest that the absence itself of experiences of being valued, cared for and safe in childhood by their family is an important factor in later experience of self-criticism, depressive symptoms and endorsing in NSSI.

The main contribution of the current study was to help clarify the extent to which these memories of negative experiences or absence of positive experiences with family, as well as peer victimization, impact on NSSI, as well as to contribute to the understanding of the processes through which this impact occurs. Results confirm our first hypothesis by suggesting that adolescents who have negative experiences in childhood with parents and/or lack on memories of being cared for and safe seem to internalize a sense of self as worthless, disgusting and hated, with a desire to persecute and exclude these negative aspects of the self, which in turn seems to increase negative emotional states (such as depressive symptoms) and lead to the engagement of NSSI. These results seem to provide evidence for what has been conceptualized as the functions

of NSSI, i.e., on the one hand NSSI has the purpose of regulating negative affect, and on the other hand it seems to be executed as a self-punishment strategy (Chapman et al., 2006; Klonsky et al., 2011; Nock, & Prinstein, 2005). In addition, these results are in accordance with literature on the etiology of NSSI, highlighting the pervasive role of early negative experiences (e.g., Chapman et al., 2006; Kaess et al., 2013). Although the association between peer victimization, depressive symptoms and NSSI has been documented (e.g., Claes et al., 2015; van Geel et al., 2015), the current study adds novel information as it shows that the link between peer victimization and NSSI occurs indirectly through the activation of a hated sense of self and also the eliciting of depressive symptoms, even when controlling for early negative experiences in childhood.

In addition, although the literature has presented sound evidence of the link between early negative experiences and the absence of positive experiences in childhood and self-criticism and depressive symptoms (e.g., Gilbert et al., 2004; Irons et al., 2006), our findings extend these results to adolescence. According to our second hypothesis, results demonstrate that this self-critical and persecuting self–to–self relating mirrors earlier experiences of being criticized, put-down and victimized by others, which in turn leads to depressive symptoms. Lastly, results from path analysis are in accordance with our last hypothesis and corroborate a recent study (Xavier et al., 2016b) in which self-hatred contributes indirectly to the endorsement of NSSI through depressive symptoms, but more importantly impacts directly on NSSI. Thus, these results show that adolescents who have a negative sense of self and self-directed hostility might engage in NSSI, even in the absence of depressive symptoms.

Although these results come from a Portuguese sample, we suggest that they can be integrated within the overall research on NSSI, having no reason to assume the presence of cultural factors influencing these results. Firstly, the prevalence of NSSI in Portugal (20%; e.g., Xavier et al., 2015, 2016a) are in line with the one reported in international studies on NSSI among non-clinical samples (24%; Giletta et al., 2012). Secondly, the correlation between NSSI and other related constructs (e.g., depression, bullying) are identical to the associations found in other studies (e.g., Marshall, Tilton-Weaver, & Stattin, 2013; Jutengren et al., 2011). Lastly, the self-report measures used in the current study were previously validated for the Portuguese population, in which their psychometric properties were in accordance with the original versions. Although we recognize that the generalization of our results should be extended with caution, these results are comparable with the ones in international studies.

Before interpreting the current results, one should be aware of some limitations. Firstly, the cross-sectional design does not allow inferences on causality between variables. All causal interpretation should be carefully considered. Nevertheless, all relationship among variables in the current study was drawn from theoretical backgrounds. Moreover, it should be noted that the

questionnaire protocol was composed by self-report measures. Although there are inherent limitations in self-report measures, the protocol benefited from its anonymity. Moreover, there is some evidence that the influence of current mood states on the recall of early experiences has been exaggerated and that this is a reliable way of measuring these kinds of experiences (e.g. Brewin, Andrews, & Gotlib, 1993). Nevertheless, other measures (e.g., ecological momentary measure; e.g., Nock, Prinstein, & Sterba, 2009) should be included in future studies when assessing self-injury as the current tool (RTSHIA) measures retrospectively NSSI. Lastly, as the current sample was collected from the community, future research should replicate these results in a clinical sample of adolescents before generalizing these results for this population.

Several preventive and clinical implications can be suggested based on the current study´s findings. Firstly, the preventive actions should not only be focused on merely identifying bullying and peer victimization, but also in conducting a rigorous assessment and intervention of self-criticism, especially its most pathogenic form, as it seems to be a risk factor for depressive symptoms and NSSI when these stressful peer situations occur. Moreover, it seems to be of additional value to implement tailored interventions according to self-critical levels in adolescents. At the same time, the current study seems to echo the importance of including parents in preventive actions, providing them with evidence for the importance of affectionate, warm and safe relationships with their children. In addition, the pervasive impact of establishing dominance-submission relationships on the development of a hostile and aggressive self–to–self relationship and in turn the vulnerability for psychopathology of their children should be acknowledged. At a clinical level, results suggest the importance of promoting new and more effective ways of relating with one´s negative internal experiences, such as memories of being rejected, devalued, threatened and subordinated in childhood. It seems that therapy with adolescents who have negative memories should benefit from promoting the development of mindfulness skills as a way of coping with these emotional memories (e.g., Baer, 2003). In addition, therapy should not only be focused on early childhood memories, but should also address the internal shaming process that underlies these experiences. Recently, the development of an internal relationship based on kindness and compassion seems to be an effective way to regulate negative affect, diminish shame and self-criticism (e.g., Gilbert & Procter, 2006), which in turn are linked to lesser depressive symptoms and NSSI.

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