

The Relationship Between Perfectionism and Nonsuicidal Self-Injury in a Student Sample of Young Adults

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Emerging research continues to underline the high prevalence of nonsuicidal self-injury (NSSI) and its negative outcomes among adolescents and young adults. To better understand the correlates of NSSI thoughts and behaviors, academic and health professionals have studied its risk factors. This study investigated whether traits of perfectionism (i.e., concern over mistakes, personal standards, parental expectations, parental criticism, doubts about actions, and organization) were associated with an increased tendency to engage in NSSI thoughts and behaviors according to gender. Using a cross-sectional study design, perfectionism and NSSI thoughts and behaviors were examined among a sample of 1,500 university students between 17 and 25 years old. Results revealed that perfectionism was a significant predictor of both NSSI thoughts and behaviors. Differential results were obtained according to gender and type of NSSI. These findings suggest that perfectionism may be a risk factor for NSSI and play unique roles in predicting NSSI among males and females.

Keywords: gender differences, nonsuicidal self-injury, perfectionism, personality, young adults

De nouvelles recherches continuent de souligner la forte prévalence de l'automutilation non-suicidaire (AMNS) et de ses conséquences négatives auprès des adolescents et des jeunes adultes. Pour mieux comprendre les corrélats des pensées et comportements liés au phénomène d'AMNS, les chercheurs et les professionnels de la santé ont étudié ses facteurs de risque. Cette étude investiguait si les traits liés au perfectionnisme (p. ex., les inquiétudes par rapport aux erreurs, les normes personnelles, les attentes parentales, la critique parentale, les doutes sur les actions et l'organisation) étaient associés à une tendance accrue aux pensées et comportements d'AMNS selon le genre. Cette étude transversale examinait le perfectionnisme et les pensées et comportements d'AMNS chez 1 500 étudiants universitaires âgés entre 17 et 25 ans. Les résultats révèlent que le perfectionnisme est un prédicteur des pensées et des comportements d'AMNS. Des résultats différentiels sont obtenus selon le sexe et le type d'AMNS. Ces résultats suggèrent que le perfectionnisme peut être un facteur de risque pour l'AMNS et qu'il pourrait jouer un rôle unique dans la prédiction de l'AMNS chez les hommes et les femmes.

Mots-clés : différences entre genres, auto-mutilation non-suicidaire, perfectionnisme, personnalité, jeunes adultes

Nonsuicidal self-injury (NSSI), which can occur in the form of thoughts and behaviors, is an important public health issue that has received increasing attention by researchers in the last 10 to 15 years (Klonsky, Victor, & Saffer, 2014). NSSI behaviors refer to the deliberate, self-inflicted destruction of body tissue in the absence of suicidal intent and for reasons that are not socially-sanctioned (Favazza, 1998; Nock & Favazza, 2009). Examples of such behaviors include cutting, carving, burning, self-hitting, and scratching (Heath & Nixon, 2009). Indeed, NSSI behaviors are associated with concerning

consequences such as an increased risk for suicide attempts (Joiner, Ribeiro, & Silva, 2012; Whitlock et al., 2013) and performance anxiety (Kiekens et al., 2015). Research has suggested that NSSI behaviors are most prevalent among adolescent and young adult populations (Swannell, Martin, Page, Hasking, & St John, 2014). In fact, pooled NSSI prevalence has been estimated at 17.2% among adolescents, 13.4% among young adults, and 5.5% among adults (Swannell et al., 2014). However, while NSSI behaviors are a well-known phenomenon, this is not the case for NSSI thoughts.

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Arguably, the more subtle manifestation of NSSI appears in the form of thoughts. NSSI thoughts refer to rumination about self-inflicted harm and the urge to engage in NSSI behaviors (Nock, 2010). For instance, this can manifest as one thinking about any self-mutilation behaviors, such as the act of cutting

oneself. Although the prevalence of NSSI thoughts has not been researched extensively, existing prevalence estimates indicate that approximately 7.8% to 14% of community-based young adults engage in NSSI thoughts (Caron, Lafontaine, & Bureau, 2016a; Levesque, Lafontaine, Bureau, Cloutier, & Dandurand, 2010; Martin, Bureau, Cloutier, & Lafontaine, 2011). While thoughts of NSSI may be more difficult to identify than behaviors, they are of equal public health concern as they can lead to NSSI behaviors (Nock, Prinstein, & Sterba, 2009). As a result, NSSI thoughts could be used as a screening test and clinical assessment tool for young adults at risk. In this context, it is important to identify risk factors that could be independently linked to NSSI behaviors and thoughts.

Theoretical Links Between Perfectionism and NSSI

Research examining intrapersonal risk factors for NSSI have typically focused on identifying under-regulated personality features, such as mood dysregulation, high aversive affect, and impulsiveness (e.g., Claes, Klonsky, Muehlenkamp, Kuppens, & Vandereycken, 2010; Favaro & Santonastaso, 2000). However, very little attention has been paid to evaluating over-regulated and restrictive features, such as perfectionism. In this context, the main goal of this study was to examine the links between various dimensions of perfectionism and NSSI thoughts and behaviors. Perfectionism is characterized by one striving to maintain unrealistically high standards in various areas of their life (Hoff & Muehlenkamp, 2009). It is conceptualized as a multidimensional construct that includes both perfectionism directed towards the self (self-oriented perfectionism; i.e., personal standards, doubts about actions, concern over mistakes, and organization) and the perceived presence of high standards and demands from others (socially-prescribed perfectionism; i.e., parental expectations and parental criticism; Frost, Marten, Lahart, & Rosenblate, 1990).

Nock and Prinstein's (Nock, 2009, 2010; Nock & Prinstein, 2004) four-function model of NSSI can be used as an explanatory framework of the relationship between restrictive features of personality, such as perfectionism, and NSSI. Automatic-negative reinforcement is the first and most often performed function of this model (Heath & Nixon, 2009). It can be defined as engaging in NSSI behaviors to remove or escape from an undesirable cognitive or emotional state (Nock & Prinstein, 2004), such as critical thoughts of personal failures, and feelings of sadness, guilt or anger (Heath & Nixon, 2009). As perfectionism is strongly related to these negative affects (Klibert, Lamis, Naufel, Yancey, & Lohr, 2015; Mandel, Dunkley, & Moroz, 2015), one can

hypothesize that individuals engaging in automatic-negative reinforcement may be more likely to engage in NSSI behaviors to alleviate such negative emotions (Claes, Soenens, Vansteenkiste, & Vandereycken, 2012).

Further, the automatic-positive reinforcement function refers to using NSSI as a way to generate some desired internal state. For instance, many individuals report NSSI behaviors as a mean to generate feelings of aliveness or to inflict feelings of self-punishment (Nock & Prinstein, 2004). Perfectionism sometimes encompasses a harsh and critical view of self, which may lead to feelings of worthlessness (Claes et al., 2012). In other words, if individuals with perfectionistic traits fail to live up to the high expectations they hold for themselves, they may experience self-loathing, and thus be more prone to engage in NSSI behaviors as a way to derogate or express anger towards themselves (Claes et al., 2012).

The third function, social-negative reinforcement, provides an additional impetus for engaging in NSSI, as it may be performed to remove some interpersonal demands (Nock & Prinstein, 2004). For example, certain individuals report that engaging in NSSI may allow them to get out of school or get their parents to stop fighting (Heath & Nixon, 2009). Nock and Prinstein (2005) found a positive association between socially-prescribed perfectionism (which includes a perception of high parental criticism and high parental expectations) and both social reinforcement functions of NSSI behaviors among adolescent psychiatric inpatients.

Finally, social-positive reinforcement refers to using NSSI behaviors as a tool to garner attention from others (Nock & Prinstein, 2004). Although this function of NSSI behaviors exists, to our knowledge, it has not been used in previous studies to explain the relationship between NSSI behaviors and perfectionism. This framework provides a better understanding of the functions of NSSI behaviors and how they can be associated with intrapersonal risk factors such as perfectionism.

NSSI Behaviors, Perfectionism and Gender

A number of studies have found that perfectionism was associated with NSSI behaviors in both community and clinical samples (Claes et al., 2012; Flett, Goldstein, Hewitt, & Wekerle, 2012; Hoff & Muehlenkamp, 2009; Luyckx, Gandhi, Bijttebier, & Claes, 2015). In fact, a study using a community sample of undergraduate students found that those who endorsed a history of NSSI behaviors scored significantly higher than individuals without a history of NSSI behaviors on certain measures of perfectionism related to self-criticism (Hoff &

Muehlenkamp, 2009). However, they scored significantly lower on personal organization, in which a high score on that subscale significantly predicted the absence of NSSI behaviors. Interestingly, this finding suggests that perfectionism related to organization might buffer against NSSI behaviors. Further, NSSI behaviors were positively related to perfectionism across samples of female psychiatric inpatients and female high school students (Luyckx et al., 2015). Moreover, within a clinical population of female patients diagnosed with eating disorders, self-injuring participants reported significantly higher levels of perfectionism (both directed toward the self and from parental criticism) than participants without a history of NSSI behaviors (Claes et al., 2012). These findings suggest that higher levels of perfectionism may play a role in engaging in NSSI behaviors.

When studied as individual concepts, both NSSI behaviors and perfectionism have been reported differently across gender (Bresin & Schoenleber, 2015; Flett et al., 2012). For instance, Bresin and Schoenleber (2015) reported that women were slightly more likely to engage in NSSI behaviors than men, which could be largely due to social expectations regarding emotion regulation strategies according to gender. Further, these differences were apparent in Flett and colleagues' study (2012) where they assessed the relationship between NSSI behaviors and perfectionism according to gender in a sample of both female and male university students. Using the self-punitiveness model, they found that criticism from parents and socially-prescribed perfectionism were positively associated with NSSI behaviors in females, while other-oriented perfectionism was negatively associated to NSSI behaviors in males. The authors suggested that these results, between perfectionism and NSSI behaviors in men, could stem from their ability to redirect self-focused attention outward (i.e., toward others) instead of directing it toward the self.

Some studies using clinical samples (Claes et al., 2012; Luyckx et al., 2015) have highlighted an association between perfectionism and NSSI behaviors, while other studies using community samples (Flett et al., 2012; Hoff & Muehlenkamp, 2009) have elucidated how certain traits of perfectionism are more likely to be related to NSSI behaviors than others. However, as studying both NSSI thoughts and behaviors is fairly new, no study has yet assessed the links between NSSI thoughts and personality features, such as perfectionism. In this light, it becomes vital to evaluate whether NSSI thoughts and behaviors are related to certain traits of perfectionism from a gender perspective.

Goals and Hypotheses

Given previous findings, the present study's aim is twofold: first, it seeks to explore the links between different subscales of perfectionism and NSSI thoughts and behaviors separately, and second it aims to verify whether these relationships vary according to gender. We expect an association between NSSI thoughts and behaviors and perfectionism subscales. The direction of that association may differ according to the nature of each subscale. As reported by previous empirical work (Flett et al., 2012), it is plausible to anticipate that perfectionism may play a different role in the use of NSSI thoughts and behaviors according to gender, and thus we tested males and females separately. However, given that little data is available on the subject of gender and NSSI, a limited number of gender-specific hypotheses were defined a priori. We tested the following hypotheses regarding each subscale of perfectionism measured:

H1. For both males and females, a higher score on concern over mistakes will be associated with an increased tendency to engage in NSSI thoughts and behaviors.

H2. For both males and females, a higher score on personal standards will be associated with an increased tendency to engage in NSSI thoughts and behaviors.

H3. For both males and females, a higher score on doubts about actions will be associated with an increased tendency to engage in NSSI thoughts and behaviors.

H4. For females only, a higher score on parental expectations will be associated with an increased tendency to engage in NSSI thoughts and behaviors.

H5. For females only, a higher score on parental criticism will be associated with an increased tendency to engage in NSSI thoughts and behaviors.

H6. For males and females, a higher score on organization will be associated with a decreased tendency to engage in NSSI thoughts and behaviors.

Method

Participants

A total of 1,664 participants were recruited for this study; however, 164 participants were excluded from the initial sample due to missing responses. Therefore, the final sample was composed of 1,500 young adults enrolled in introductory psychology courses at an

eastern Canadian university. Eligibility criteria included (a) being between the ages of 17 and 25, (b) being involved in a romantic relationship at the time of participation, and (c) having a good knowledge of English. This sample included 1,240 females (82.7%) and 260 males (17.3%), which reflects usual gender representation of first year introductory psychology courses. The average age of participants was 20.28 years ($SD = 3.97$) for women and 20.46 years ($SD = 3.06$) for men. Participants were either Anglophone (74%) or Francophone (26%). With regard to participants' ethnic or racial background, 76.4% of participants self-identified as a person of European descent, 6.9% as Black, 6.3% as Asian, 1.3% as Hispanic, and 9.1% as a person of another ethnic or racial background. As compensation for their participation, participants were allotted two credit points towards their final course grade. The institution's Research Ethics Board approved all procedures, and the participants were treated within the guidelines outlined by national and institutional ethical standards for human experimentation.

Procedure

Participants were recruited between 2011 and 2015 through an online program offering psychology students the opportunity to partake in research being conducted at their university. The present data was collected in a larger study that sought participants who were in a romantic relationship. It was advertised as investigating the influences of romantic relationships in predicting different coping strategies in young adults. Interested participants were provided with access to the questionnaire package through Survey Monkey, a secure and encrypted website designed for online studies. An introductory detailed letter outlined the voluntary nature of the study and the participants' right to withdraw from the study at any time without penalty. Participants were allowed to not respond to any questions they were not comfortable to answer. It was clearly written that by beginning the questionnaire package, their consent was implied. Anonymity was ensured with the use of an identification code provided by the computerized system. The questionnaire package took an average of 120 minutes to complete, and progress could be resumed at a later time. Questionnaires addressed topics such as caregiving behaviors in romantic relationships, relationship satisfaction, romantic attachment, childhood experiences and emotion regulation. Once participants completed the questionnaire package, they were provided with a list of psychological resources available to use at their own discretion.

Materials

Sociodemographic questionnaire. This questionnaire was used to gather personal

demographic information about participants (e.g., age, gender, and ethnicity/racial background).

Nonsuicidal self-injury. In the current study, two items from the *Ottawa Self-Injury Inventory* (OSI; Cloutier & Nixon, 2003) were used: a first item was used to assess the experience of NSSI thoughts over the last six months (e.g., "*How often in the last six months have you thought about injuring yourself without the intention to kill yourself?*"). A second item measured the presence or absence of participants' engagement in NSSI behaviors over the past six months (e.g., "*How often in the last six months have you actually injured yourself without the intention to kill yourself?*"). Although these questions clearly pertain to NSSI thoughts and behaviors, it is worth mentioning that they did not mention the deliberate nature of the act, nor its social aspect, as per its definition. A five-point Likert-type response format indicated the frequency of occurrences of self-injurious thoughts and behaviors: i.e., 1 (*not at all*), 2 (*1-5 times*), 3 (*monthly*), 4 (*weekly*), and 5 (*daily*). Response categories were coded with the scores "0, 1, 2, 3 and 4" respectively and were then collapsed dichotomously as 0 and 1 to represent the absence (i.e., 0; *no self-injury*) and the presence of self-injurious thoughts and behaviors (i.e., 1; *at least one incident of self-injury during the past six months*). In the present study, engagement in self-injurious behaviors and thoughts was analysed separately in order to individually examine these two phenomena. For more information on the psychometric properties of the full questionnaire, please refer to Martin and colleagues (2013) and Cloutier and Nixon (2003).

Perfectionism. The *Frost Multidimensional Perfectionism Scale* (FMPS; Frost et al., 1990) is a 35-item measure designed to assess six components of perfectionism. Concern over mistakes is defined as a negative reaction to mistakes and the tendency to perceive mistakes as failures (9 items, e.g., "*If I do not do well all the time, people will not respect me*"). High personal standards refer to setting very high standards for oneself and placing great importance on these standards for self-evaluation (7 items, e.g., "*I expect higher performance in my daily tasks than most people*"). Doubts about actions encompasses a constant feeling of uncertainty about one's actions or beliefs (4 items, e.g., "*I tend to get behind in my work because I repeat things over and over*"). Organization is characterized as one's preference for order and neatness (6 items, e.g., "*I am a neat person*"). Lastly, the subscales of parental expectations and parental criticism include the tendency to believe that one's parents or caregivers set very high goals (5 items, e.g., "*My parents wanted me to be the best at everything*") and are overcritical (4 items, e.g., "*As a child, I was punished for doing things less than perfect*"),

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respectively. Each item is rated on a 5-point Likert response scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Higher scores on all subscales indicate a greater degree of perfectionism. Subscale scores were obtained by summing the scores of the items in each respective subscale. In past research, the FMPS has demonstrated adequate to excellent internal reliability with Cronbach’s alpha coefficients ranging from .77 to .93 (Frost et al., 1990). Furthermore, various studies demonstrated good convergent and concurrent validity of the FMPS (Burns, 1980; Garner, Olmstead, & Polivy, 1983; Hewitt & Flett, 2004). In the present study, the Cronbach’s alpha coefficients were as follows: .90 for concern over mistakes, .84 for high personal standards, .87 for parental expectations, .85 for parental criticism, .79 for doubts about actions, and .92 for organization.

Results

Preliminary Analysis

All statistical analyses were conducted with SPSS version 18.0. Analyses revealed there were no multivariate outliers in the data set. An evaluation of missing data using Little’s MCAR test (Little, 1988) revealed that the data may be assumed missing completely at random, $\chi^2(14) = 15.28, p > .05$. Moreover, to optimize the sample size, missing values were estimated using expectation maximization. In large samples, when the variables have less than 5% missing data and are missing at random, this option is deemed appropriate for use (Tabachnick & Fidell, 2007). In the present study, none of the variables had more than 1% missing data.

Descriptive Statistics

Initial coding allowed for separate analyses of participants with NSSI thoughts and NSSI behaviors. From the final sample of 1,500 participants included

in the analyses, 12.5% ($n = 188$) reported having experienced NSSI thoughts without having engaged in NSSI behaviors at least once in the past six months. Of these participants, 85.6% ($n = 161$) were female and 14.4% ($n = 27$) were male. Moreover, 8.7% ($n = 131$) of participants reported having engaged in NSSI behaviors at least once in the past six months. Of this number, 85.5% ($n = 112$) were female and 14.5% ($n = 19$) were male.

Please note that when analysing NSSI thoughts, participants who engaged in NSSI behaviors were removed from further statistical analysis to only include participants who had thoughts but no behaviors. However, the whole sample was used when exploring NSSI behaviors. We found no significant gender differences for NSSI thoughts, $\chi^2(1, N = 1,369) = .21, p = .209$, and NSSI behaviors, $\chi^2(1, N = 1,500) = .80, p = .370$.

In Tables 1 and 2, the means and standard deviations for the independent variables (i.e., concern over mistakes, high personal standards, parental expectations, parental criticism, doubts about actions, and organization) are presented according to gender. Table 1 compares the presence and absence of NSSI thoughts, while Table 2 compares the presence and absence of NSSI behaviors. When only NSSI thoughts were present, the analysis revealed that females scored significantly higher on the doubts about actions, $F(1, 186) = 4.75, p = .031$, and organization, $F(1, 186) = 7.85, p = .006$, subscales. In addition, the results for the absence of NSSI thoughts indicated that males scored significantly higher for high personal standards, $F(1, 1179) = 4.78, p = .029$, and parental criticism, $F(1, 1179) = 6.48, p = .011$, while females scored higher on organization, $F(1, 1179) = 29.72, p = .001$. In respect to the presence of NSSI behaviors, results on all perfectionism subscales were not significantly different between males and females.

Table 1

Means and Standard Deviations for Perfectionism and NSSI Thoughts and Differences Across Gender

Variable	NSSI Thought Absent				F	NSSI Thought Present				F
	Female		Male			Female		Male		
	M	SD	M	SD		M	SD	M	SD	
Concern over mistakes	21.69	7.02	22.62	7.46	3.02	26.11	7.99	26.25	7.89	0.01
Personal standards	22.78	5.23	23.65	5.44	4.78*	23.09	5.81	22.74	5.89	0.08
Parental expectations	13.65	4.39	14.25	4.51	3.17	15.77	5.23	15.56	4.57	0.04
Parental criticism	8.36	3.46	9.02	3.56	6.48*	10.67	4.09	10.78	3.95	0.02
Doubts about actions	10.51	3.31	10.43	3.31	0.10	12.42	3.11	11.03	2.75	4.75*
Organization	23.55	4.52	21.67	4.78	29.72***	22.54	4.64	19.67	6.40	7.85**
n	967		214			161		27		

Note. $N = 1369$; When analysing NSSI thoughts, participants who engaged in NSSI behaviors were removed from the statistical analysis; * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 2

Means and Standard Deviations for Perfectionism and NSSI Behaviors and Differences Across Gender

Variable	NSSI Behaviors Absent				F	NSSI Behaviors Present				F
	Female		Male			Female		Male		
	M	SD	M	SD		M	SD	M	SD	
Concern over mistakes	22.32	7.33	23.03	7.58	1.83	26.50	7.80	27.69	6.72	0.39
Personal standards	22.83	5.32	23.55	5.49	3.64	24.12	5.65	24.34	5.23	0.03
Parental expectations	13.96	4.58	14.39	4.52	1.84	15.46	5.04	16.59	4.93	0.83
Parental criticism	8.69	3.65	9.22	3.64	4.28*	10.91	4.15	10.95	4.24	0.00
Doubts about actions	10.78	3.35	10.50	3.25	1.45	12.84	3.29	12.36	3.22	0.34
Organization	23.41	4.55	21.45	5.01	35.56***	22.45	5.22	19.95	5.81	3.60
<i>n</i>	1,128		241			112		19		

Note. *N* = 1500; When analysing NSSI behaviors, the entire sample was used; * $p < .05$. *** $p < .001$.

However, the results revealed that when there was an absence of NSSI behaviors, males were more likely to report parental criticism than females, $F(1, 1367) = 4.28, p = .039$. Moreover, females were more likely to score higher on organization than males, $F(1, 1367) = 35.56, p = .001$. Further statistical analyses were conducted separately for males and females in light of gender differences on these subscales and will be presented in Tables 3 and 4.

Correlational analyses (see Table 3) demonstrated that greater levels of concern over mistakes were significantly related to the presence of NSSI thoughts and NSSI behaviors in males, $r = .15, p = .019$, and $r = .16, p = .01$, for thoughts and behaviors respectively and females, $r = .21, p = .001$, and $r = .16, p = .001$, for thoughts and behaviors respectively. In addition, females with a greater score on high personal standards tended to display NSSI behaviors, $r = .07, p = .015$. A greater score on parental expectations and doubts about actions were significantly related to the presence of NSSI behaviors in males, $r = .13, p = .044$ and, $r = .15, p = .017$, for parental expectations and doubts about actions respectively and females, $r = .09, p = .001$, and $r = .17, p = .001$, for parental

expectations and doubts about actions respectively as well as to the presence of NSSI thoughts in females, $r = .16, p = .001$, $r = .20, p = .001$. Moreover, a higher score on parental criticism was significantly related to the presence of NSSI thoughts in males, $r = .15, p = .018$, and females, $r = .22, p = .001$, and also to the presence of NSSI behaviors in females, $r = .17, p = .001$. Lastly, a higher score on organization was significantly related to the absence of NSSI thoughts in males, $r = -.13, p = .05$, and females, $r = -.08, p = .009$, and also to the absence of NSSI behaviors in females, $r = -.06, p = .036$.

Multiple Logistic Regressions

Four multiple logistic regressions were conducted to determine the relative influence of each predictor (i.e., concern over mistakes, personal standards, parental expectations, parental criticism, doubts about actions, and organization) on NSSI thoughts and NSSI behaviors. Separate regressions were conducted for males and females.

The first regression was performed to study the associations between the perfectionism subscales on NSSI thoughts in the female subsample (see Table 4).

Table 3

Pearson Correlations Between Subscales of Perfectionism and NSSI Thoughts and Behaviors as a Function of Gender

Variable	Thoughts		Behaviors	
	Female	Male	Female	Male
	(<i>n</i> = 161)	(<i>n</i> = 27)	(<i>n</i> = 112)	(<i>n</i> = 19)
Concern over mistakes	.21**	.15*	.16**	.16**
Personal standards	.02	-.05	.07*	.04
Parental expectations	.16**	.09	.09**	.13*
Parental criticism	.22**	.15*	.17**	.12
Doubts about actions	.20**	.06	.17**	.15*
Organization	-.08**	-.13*	-.06*	-.08

Note. * $p < .05$. ** $p < .01$.

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Table 4

Multiple Logistic Regression for the Subscales of Perfectionism and NSSI Thoughts According to Gender

Variable	R^2		B	$SE B$	Wald χ^2	Exp(B)
	Cox & Snell	Nagelkerke				
Perfectionism in females	.08	.13				
Concern over mistakes			0.06**	0.02	9.66	1.07
Personal standards			-0.08***	0.03	10.45	0.92
Parental expectations			0.19	0.03	0.37	1.02
Parental criticism			0.07	0.04	3.64	1.08
Doubts about actions			0.09*	0.04	6.09	1.10
Organization			-0.02	0.02	1.03	0.98
Perfectionism in males	.05	.11				
Concern over mistakes			0.10*	0.05	4.01	1.10
Personal standards			-0.06	0.06	1.19	0.94
Parental expectations			-0.02	0.09	0.04	0.98
Parental criticism			0.07	0.10	0.52	1.07
Doubts about actions			-0.08	0.10	0.66	0.93
Organization			-0.05	0.05	1.29	0.95

Note. Wald χ^2 : Chi square of the logistic regression. Exp(B): Odds Ratio (OR); * $p < .05$. ** $p < .01$. *** $p < .001$.

This model explained 13.4% (Nagelkerke R^2) of the variance in NSSI thoughts. The results demonstrated that concern over mistakes, $\beta = .06$, Wald $\chi^2 = 9.66$, $p = .004$, and doubts about actions, $\beta = .09$, Wald $\chi^2 = 6.09$, $p = .038$, significantly influenced NSSI thoughts in females. More precisely, for each unit increase in the concern over mistakes score, the probability of reporting NSSI thoughts increased by a multiplicative factor of 1.07, while for each unit increase in the doubts about actions score, the probability of reporting NSSI thoughts increased by a multiplicative factor of 1.10. However, a negative association was found for personal standards, $\beta = -.08$, Wald $\chi^2 = 10.45$, $p = .006$. For each unit increase on the personal standards score, the probability of reporting NSSI thoughts decreased by a multiplicative factor of .92.

The second regression was conducted to examine the associations between the subscales of perfectionism and NSSI thoughts in the male subsample (see Table 4). This model explained 10.8% (Nagelkerke R^2) of the variance in NSSI thoughts. This analysis revealed that concern over mistakes was significantly related to NSSI thoughts in males, $\beta = .10$, Wald $\chi^2 = 4.01$, $p = .032$. For each unit increase in the concern over mistakes score, the probability of males reporting NSSI thoughts increased by a multiplicative factor of 1.10.

The third regression was conducted in order to explore the influence of perfectionism on NSSI behaviors in females (see Table 5). This model

explained 9.9% (Nagelkerke R^2) of the variance in NSSI behaviors. The analysis revealed that both parental criticism, $\beta = .13$, Wald $\chi^2 = 8.81$, $p = .006$, and doubts about actions, $\beta = .12$, Wald $\chi^2 = 8.31$, $p = .008$, positively influenced the presence of NSSI behaviors. In addition, organization, $\beta = -.05$, Wald $\chi^2 = 0.25$, $p = .034$, negatively influenced the presence of NSSI behaviors. Specifically, for each unit increase in the parental criticism score, the probability of reporting NSSI behaviors increased by a multiplicative factor of 1.14. Similarly, for each unit increase in the doubts about actions score, the probability of reporting NSSI behaviors increased by a multiplicative factor of 1.13. Lastly, for each unit increase in the organization score, the probability of reporting NSSI behaviors decreased by a multiplicative factor of .95.

Finally, the fourth regression was conducted to explore the impact of perfectionism on the experience of NSSI behaviors in males (see Table 5). The analyses revealed that none of the perfectionism subscales were significantly related to the presence of NSSI behaviors in males.

Discussion

The primary aim of this study was to investigate potential links between subscales of perfectionism and NSSI thoughts and behaviors according to gender among a student sample of young adults. Our results indicate that NSSI thoughts and behaviors occur in proportionate frequencies between males and females,

Table 5

Multiple Logistic Regression for the Subscales of Perfectionism and NSSI Behaviors According to Gender

Variable	R^2		B	$SE B$	Wald χ^2	Exp(B)
	Cox & Snell	Nagelkerke				
Perfectionism in females	.05	.10				
Concern over mistakes			0.02	0.02	0.43	1.02
Personal standards			0.02	0.03	0.58	1.02
Parental expectations			-0.06	0.04	3.36	0.94
Parental criticism			0.13**	0.04	8.81	1.14
Doubts about actions			0.12**	0.04	8.31	1.13
Organization			-0.05*	0.03	4.61	0.95
Perfectionism in males	.04	.10				
Concern over mistakes			0.04	0.05	0.68	1.04
Personal standards			-0.03	0.06	0.28	0.97
Parental expectations			0.09	0.10	0.89	1.10
Parental criticism			-0.05	0.11	0.23	0.95
Doubts about actions			0.13	0.10	1.55	1.14
Organization			-0.06	0.05	1.79	0.94

Note. Wald χ^2 : Chi square of the logistic regression. Exp(B): Odds Ratio (OR); * $p < .05$. ** $p < .01$.

which contrast the findings of a recent meta-analysis that suggested women were more likely to engage in NSSI behaviors than men (Bresin & Schoenleber, 2015). In addition, we demonstrated that particular subscales of perfectionism were related to the presence of NSSI thoughts and behaviors, partially confirming the present study hypotheses. These results differed according to type of NSSI endorsed (i.e., thoughts or behaviors) and gender.

As hypothesized, the more females and males reported a negative reaction to mistakes and the tendency to perceive them as failures (i.e., concerns over mistakes), the more they reported NSSI thoughts. Further, the more females reported uncertainty about their actions and beliefs (i.e., doubts about actions), the more likely they were to experience NSSI thoughts. This partially confirmed our hypothesis, which stated that these results would be found in both females and males. Existing research has established links between NSSI behaviors and concern over mistakes (Claes et al., 2012; Hoff & Muehlenkamp, 2009), as well as between NSSI behaviors and doubts about actions (Claes et al., 2012). In this context, NSSI thoughts could be used as a coping mechanism to punish oneself for their own inability to succeed (i.e., automatic-positive reinforcement function; Nock & Prinstein, 2004).

Our results may also be interpreted using the conceptualization of perfectionism as comprising both adaptive and maladaptive dimensions (Dunkley, Blankstein, Masheb, & Grilo, 2006). Perfectionism

can be divided into two overarching constructs: personal standards perfectionism (PSP) and evaluative concerns perfectionism (ECP). On the one hand, PSP is more adaptive and pushes people to strive for high personal standards and goals. On the other hand, ECP pertains to high self-criticism and evaluation of one's own behavior, constant concerns about others' criticism and expectations, and an inability to gain satisfaction from personal successes, which may lead one to develop internalizing problems (Dunkley et al., 2006). Based on the comparison of the definitions of PSP and ECP, we suggest that ECP encompasses both concern over mistakes and doubts about actions. In sum, this may indicate that these dimensions of perfectionism may increase one's susceptibility to the use of NSSI thoughts and behaviors.

Moreover, our hypothesis that a higher score on personal standards would be associated with an increased tendency to engage in NSSI thoughts for both males and females was not confirmed. Indeed, the more females reported setting very high standards for themselves and evaluating their value based on the achievement of those standards, the less likely they were to experience NSSI thoughts. In fact, it would appear that high personal standards, encompassing more characteristics of PSP, were negatively associated with NSSI thoughts. Broadly speaking, this suggests that PSP may serve as a protective factor against NSSI. Understandably, it could be argued that individuals could constantly strive for higher standards once a goal has been achieved. This would in turn create a stressful environment that could lead

to potential psychological issues, which could make this behavior maladaptive. That said, having high personal standards could also be evaluated as adaptive as it may lead to a high degree of motivation and a strong sense of accomplishment upon achieving one's goal. This could give way to a positive internal state.

Our hypothesis stating that a higher score on parental criticism and doubts about actions would be related to an increased tendency to engage in NSSI behaviors in females was confirmed. Indeed, the more females perceived having overly critical parents (i.e., parental criticism) and hesitated about their actions or beliefs (i.e., doubts about actions), the more likely they were to engage in NSSI behaviors. To date, studies that have examined the association between perfectionism and NSSI behaviors (e.g., Claes et al., 2012; Flett et al., 2012; Hoff & Muehlenkamp, 2009) similarly found that participants who endorsed NSSI behaviors reported both greater parental criticism and doubts about actions. Additionally, Yates, Tracy, and Luthar (2008) found that parental criticism was associated with an increased engagement in NSSI behaviors. With this in mind, external criticism can be internalized as self-criticism and self-doubt, which are characteristic of ECP, making it maladaptive. This supports Nock and Prinstein's (2004) four-function model, where individuals who doubt their actions and perceive high parental criticism could use NSSI behaviors as a way to remove an undesirable internal state (i.e., automatic-negative reinforcement), inflict self-punishment (i.e., automatic-positive reinforcement), remove interpersonal demands from parents (i.e., social-negative reinforcement), or seek support in order to alleviate their distress (i.e., social-positive reinforcement).

Additionally, our hypothesis stating that a higher score on organization would be associated with a decreased tendency to engage in NSSI thoughts and behaviors was confirmed for females and behaviors only. Indeed, female participants who had a preference for order and neatness (i.e., organization) were less likely to report engagement in NSSI behaviors, confirming previous findings (Hoff & Muehlenkamp, 2009). We suggest that this subscale of perfectionism encompasses characteristics of PSP, as it could be related to a person's high standards of neatness, making it a protective factor against NSSI behaviors. More specifically, organizing one's environment could create an internal sense of security, which, in turn, could lead to a positive state of mind.

Lastly, we had initially hypothesized that males who scored higher on the subscales of concern over mistakes, personal standards and doubts about actions would have an increased tendency to engage in NSSI thoughts and behaviors, and that those who scored

higher on organization would have a decreased tendency to engage in NSSI thoughts and behaviors. However, with the exception of a positive relationship between perfectionism and NSSI thoughts in males on the concern over mistakes subscale, no link was found between NSSI thoughts and other subscales of perfectionism. No relationship was found between NSSI behaviors and perfectionism subscales. These findings suggest that perfectionism may more strongly contribute to NSSI thoughts and behaviors among females than among males. This confirms results reported by Flett and colleagues (2012), whereby females who reported having highly critical parents tended to engage in more NSSI behaviors than males. Moreover, the small number of male participants in the current study could explain the lack of results for that group. Nonetheless, future research could examine the associations between NSSI thoughts and behaviors and other personality traits in males with the intention of better explaining NSSI thoughts and behaviors correlates in males.

It is worth mentioning that, in the current study, NSSI thoughts and NSSI behaviors were not necessarily associated with the same subscales of perfectionism. For instance, while perfectionism resulting from concern over mistakes was significantly related to the presence of NSSI thoughts in males and females, it was not related to NSSI behaviors. This could be explained by methodological differences, such as the type of questions used (e.g., the range of NSSI behaviors participants were asked to identify) and participant demographics (e.g., clinical or community samples).

Implications

The findings from the present study demonstrate the importance of evaluating perfectionism in predicting NSSI thoughts and behaviors in young adults. In addition, these results more likely demonstrate that there is a different explanatory model of NSSI thoughts and behaviors, and future research should continue to test theoretical models separately for these two concepts. Indeed, findings from recent research conducted by Caron and colleagues (2016a) and Caron, Lafontaine, and Bureau (2016b) offer further support for the notion that NSSI thoughts and behaviors may be uniquely linked to differing correlates. Specifically, they found that certain romantic relationship constructs (i.e., insecure romantic attachment, negative romantic caregiving behaviors, and low sexual satisfaction) were linked to NSSI thoughts and not behaviors (Caron et al., 2016b), while intimate partner violence victimization was linked to NSSI behaviors and not thoughts (Caron et al., 2016a). Taken together, these findings suggest that individuals may be more likely to engage in

relatively more harmful coping strategies (e.g., NSSI behaviors) in response to more severe stressors (i.e., intimate partner violence victimization). Distress resulting from relatively less severe stressors (e.g., low sexual satisfaction) may be effectively reduced through engagement in less dangerous coping methods (e.g., thinking of harming oneself).

The findings of this study may also hold certain clinical implications, as they indicate that particular subscales of perfectionism seem to be linked to the use of NSSI thoughts and behaviors more so than other subscales. Specifically, adaptive dimensions of perfectionism may act as a protective factor against NSSI thoughts and behaviors, while maladaptive dimensions of perfectionism may lead to engagement in NSSI thoughts and behaviors. These specific dimensions of perfectionism could be considered as a focus of treatment for NSSI thoughts and behaviors and prevention efforts for young adults, particularly young females.

Limitations

Despite the important empirical and clinical implications of this study, certain methodological limitations must be acknowledged. Firstly, the findings are correlational, and thus it cannot be inferred that perfectionism causes NSSI thoughts or behaviors. Nonetheless this study provides invaluable information about how different subscales of perfectionism may be associated to that phenomenon. Secondly, as the sample consists solely of undergraduate university students enrolled in introductory psychology courses, this sample may not be representative of the general population of young adults. Moreover, given that most psychology courses tend to have a greater number of female enrolment, the sample did not favor equal gender representation, which may serve to explain the relatively fewer significant findings for males. In addition, this sample consisted primarily of participants of European descent, which makes it difficult to generalize the results to individuals of other ethnic or racial backgrounds. Further, participants were not asked to report mental illness, and thus such characteristics of the sample could partly explain the relationship between variables (Zetterqvist, 2015). In addition, while participants' consent forms mentioned that they would be asked to answer questions on "past and/or present self-injuring behaviors", the two questions that were used did not mention the deliberate nature of the act, nor its social aspect. As a result, the definition of NSSI may have been understood differently among participants. However, as the measure later asks whether participants have adopted specific NSSI thoughts and/or behaviors, the examples would have clarified the definition. Finally, having conducted

multiple analyses may have increased the likelihood for type I error.

Conclusion

In conclusion, our findings suggest that most aspects of perfectionism are either positively or negatively related to NSSI thoughts or NSSI behaviors, particularly so for females. Overall, the findings are consistent with the four-function model of NSSI behaviors (Nock, 2009, 2010; Nock & Prinstein, 2004) and past research (e.g., Hoff & Muehlenkamp, 2009). Future research on NSSI thoughts and behaviors could verify whether NSSI thoughts could be the first coping mechanism for psychological distress related to perfectionism. Specifically, it would be interesting to study whether lower scores of perfectionism would predict NSSI thoughts, while higher scores would predict NSSI behaviors. In addition, while the current study was interested in the prevalence of NSSI thoughts and behaviors, it would have been of interest to assess the motivations for those behaviors by using the full OSI measure. Finally, research efforts (e.g., Kiekens et al., 2015) initiated on the association between NSSI behaviors and personality traits (i.e., openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism) may be pursued to include emotional competence and self-sacrifice, which, to our knowledge, are traits that have not yet been studied in this context. As these personality traits may have an impact on one's view of the self and others, it could be interesting to see how it may relate to NSSI. Future research could also identify differing associations between these traits and NSSI thoughts and behaviors individually.

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