


Predictors of Non-Suicidal Self-Injury Versus Attempted Suicide: Similar or Different?

Author: Lars Wichstrøm^a

Affiliation: ^a Lars Wichstrøm, Norwegian University of Science and Technology, Trondheim, Norway

DOI: 10.1080/13811110902834992

Publication Frequency: 4 issues per year

Published in:  [Archives of Suicide Research](#), Volume [13](#), Issue [2](#) April 2009 , pages 105 - 122

Abstract

A nationally representative sample of Norwegian high school students (ages 14 to 19, N = 2,924) completed self-reports in school about non-suicidal self-injury (NSSI), suicide attempt (SA), and risk and protective factors. They were re-examined 5 years later. In all 2.2% reported NSSI with no SA during the follow-up period and 3.2% reported SA. Several risk and protective factors were common to NSSI and SA: previous SA, young age, debut of sexual intercourse before the age of 15, and non-heterosexual sexual interest. However, other risk and protective factors were unique to NSSI or SA: Previous NSSI increased the risk for future NSSI whereas satisfaction with social support protected against later NSSI. Suicidal ideation increased the risk for SA whereas attachment to parents protected against it. NSSI did not increase the risk of future SA. NSSI and SA may be thus conceived of as only partly overlapping phenomena, and not necessarily just representing different degrees of suicidality.

Keywords: adolescent; high school students; prospective; self-harm; self-injury; suicide attempts

The body of knowledge concerning suicidal behavior and deliberate self-harm among adolescents has gradually increased during the last two decades. At the same time researchers have witnessed an ever increasing number of terms such as “attempted suicide,” “deliberate self-harm,” “parasuicide,” “self-mutilation,” “antisuicide,” “indirect self-destructive behavior,” “suicidal gestures,” and “focal suicide” (O'Carroll, Berman, Maris et al., [1996](#)), to mention a few. The distinctions between these terms are blurred, and this is an imprecision that hinders empirical research. However, an important distinction can be made between self-injurious behavior that was intended as an attempt to end ones own life and self-injurious behavior that was not. We will term the former suicide attempt (SA) and the latter non-suicidal self-injury (NSSI). Empirically, there are two noticeable shortcomings in this field: the dearth of studies on the similarities and differences between various forms of self-injurious behavior, and the absence of prospective studies addressing risk and protective factors for self-injurious behavior without suicidal intent.

Differences between Forms of Self-Injurious Behavior

As regards NSSI and SA some researchers argue in favor of a continuum hypothesis, and

maintain that various forms of self-injurious behavior represent different degrees of lethality of self-injury (Stanley, Winchel, Molcho et al. [1992](#); Wong, Stewart, & Lam, [2007](#)). Others claim that the motives for NSSI and SA are different. NSSI may be conceived of as a coping mechanism to regulate overwhelming emotions (Favazza, [1998](#); Linehan, [1993](#); Nock & Kessler, [2006](#); Nock & Prinstein, [2005](#)) and the motives for NSSI thus center on ways to endure life, whereas SA centers on ending life or getting away (Muehlenkamp & Gutierrez, [2004](#)). Most people who self-harm have no intention to die from it (Favazza, [1998](#)), and methods involved in NSSI and SA are often quite different. Some have argued that NSSI is a separate clinical syndrome that should be included in future editions of the Diagnostic and Statistical Manual as a unique disorder (Muehlenkamp, [2005](#)). If NSSI is indeed a separate disorder it should have a different etiology than what it resembles the most, namely SA. Alas, surprisingly little research has been carried out to support either view. Empirically, there is considerable co-morbidity between forms of self-injurious behavior, and milder forms of self-injurious behaviors are risk factors for more severe forms (Grøholt, Ekeberg, & Wichstrøm, [1998](#); Grøholt, Ekeberg, Wichstrøm et al. [2000](#); Owens, Horrocks, & House, [2002](#); Stanley, Winchel, Molcho et al., [1992](#)). Risk factors should therefore be expected to overlap. However, we do not know if one type of previous self-injurious behavior (e.g., NSSI) is a true risk factor for another self-injurious behavior (e.g., SA), or if this relationship is just spurious owing to other shared risk factors.

There appear to be only four studies that have compared NSSI and SA. One study of adolescents admitted to emergency ward for self-injury showed that SA were more often depressed and felt more hopeless but had less often disruptive disorders and were less often substance abusers as compared to NSSI (Grøholt, Ekeberg, & Haldorsen, [2000](#)). The three other studies are non-clinical. First, participants in the National Comorbidity Study with definite SA were compared to participants who stated that they had a suicide attempt that was a “cry for help” and that they did not intend to die from the attempt (Nock & Kessler, [2006](#)). The latter group may form a sub-population of non-suicidal self-injurers. Those with SA in this study were more often males and had fewer years of education, they had more often disruptive disorders and substance use disorders, more phobia, depression, and more often a history of sexual and physical assaults as compared to the ones stating a cry for help. Second, greater repulsion by life and less attraction to life have been reported among those involved in SA as compared to those involved with NSSI (Muehlenkamp & Gutierrez, [2004](#)). Third, higher scores on anxiety, depression, substance use, and suicide ideation have been found among SA as compared to NSSI (Wong, Stewart, & Lam, [2007](#)). The reason for NSSI has been reported to be emotion and thought regulation (Lloyd-Richardson, Perrine, Dierker et al., [2007](#)), whereas SA more often was intended to “make others better off” (Brown, Comtois, & Linehan, [2002](#)). Moreover, patients with cluster B personality disorders with suicide attempts and NSSI differed from patients with cluster B personality disorder without NSSI by being more depressed, anxious, aggressive, and impulsive (Stanley, Gameroff, Michalsen et al., [2001](#)). Finally, basic knowledge about the prevalence and course of NSSI is scarce. In sum the cross-sectional studies that do exist suggest that those with SA have more internalized problems, particularly depression and anxiety, more conduct problems and possibly substance abuse, and potentially more suicidal ideation than those with NSSI. However, the one clinical study that has been carried out reported less disruptive disorders and substance use among SA as compared to NSSI. Since multivariate and prospective studies are lacking, we do not know whether these are true unique risk factors or not, or only putative risk factors.

Risk and Protective Factors for Suicide Attempts

A considerable number of cross-sectional findings have accumulated regarding the characteristics of adolescents who have previously attempted suicide, as opposed to those who have not (Evans, Hawton, & Rodham, [2004](#); Gould, Greenberg, Velting et al., [2003](#)). However, the number of prospective studies that may shed light on the antecedent of SA is still limited. The results from such prospective studies may be grouped into five domains of risk and protection. The following does not comprise a full list of all studies on self-injury, but it captures studies on the relevant risk and protective factors for this study. 1. *Parent and family domain* which include not living with both biological parents (Christoffersen, Poulsen, & Nielsen, [2003](#); Fergusson, Beautrais, & Horwood, [2003](#)); parental psychopathology (Christoffersen, Poulson, & Nielsen, [2003](#); Johnson, Cohen, Gould et al., [2002](#)); parental abuse or neglect (Christoffersen, Poulson, & Nielsen, [2003](#); Johnson, Cohen, Gould et al., [2002](#)); family poverty (Christoffersen, Poulson, & Nielsen, [2003](#)); family history of suicidality (Christoffersen, Poulson & Nielsen, [2003](#); Wichstrøm & Hegna, [2003](#)); being born to a teenage mother (Lewinsohn, Rohde, & Seeley, [1994](#)); and low family cohesion (McKeown, Garrison, Cuffe et al., [1998](#)). 2. *Self-concept and personality* including poor self-esteem (Fergusson, Beautrais, & Horwood, [2003](#); Lewinsohn, Rohde, & Seeley, [1994](#); Wichstrøm, [2000](#)); neuroticism (Fergusson, Beautrais, & Horwood, [2003](#)); novelty seeking (Fergusson, Beautrais, & Horwood, [2003](#)); and impulsivity (McKeown, Garrison, Cuffe et al., [1998](#)). 3. *Symptoms and problems* including drug or alcohol use or dependence (Christoffersen, Poulson, & Nielsen, [2003](#); Juon & Ensminger, [1997](#); Reifman & Windle, [1995](#); Reinherz, Giaconia, Silverman et al., [1995](#); Wichstrøm, [2000](#); Wilcox & Anthony, [2004](#)); psychiatric problems or disorders, also including depression (Christoffersen, Poulson, & Nielsen, [2003](#); Fergusson, Beautrais, & Horwood, [2003](#); Juon & Ensminger, [1997](#); Lewinsohn, Rohde, & Seeley, [1994](#); McKeown, Garrison, Cuffe et al., [1998](#); Reifman & Windle, [1995](#); Reinherz, Giaconia, Silverman et al., [1995](#); Wichstrøm, [2000](#)); suicidal ideation or plans (Fergusson, Beautrais, & Horwood, [2003](#); McKeown, Garrison, Cuffe et al., [1998](#); Wichstrøm, [2000](#)); past attempt (Lewinsohn, Rohde, & Seeley, [1994](#); McKeown, Garrison, Cuffe et al., [1998](#); Reifman & Windle, [1995](#); Wichstrøm, [2000](#)). 4. *Sexuality* including sexual debut before the age of 15 (Wichstrøm & Hegna, 2003) and same-sex sexual experience (Wichstrøm & Hegna, 2003). 5. *Social support and integration* including interpersonal conflicts with peers and family members (Christoffersen, Poulsen, & Nielsen, [2003](#)); loneliness (Christoffersen, Poulsen, & Nielsen, [2003](#)); associating with deviant peers (Fergusson, Beautrais, & Horwood, [2003](#)); frequent moves (males) (Juon & Ensminger, [1997](#)). In addition female gender (Wichstrøm, [2000](#)) and being in and early or middle adolescence increase the risk for later NSSI (Groholt, Ekeberg, Wichstrom, & Haldorsen, 2000).

Risk and Protective Factors for NSSI

There appears to be no prospective study of self-injurious behavior where SA is not included in the construct. Most of what we know about NSSI comes from clinical data (Klonsky, Oltmanns, & Turkheimer, [2003](#)). Studies of non-clinical samples have identified the following risk factors for NSSI at least twice: Psychiatric disorder (Skegg, Nada-Raja, & Moffitt, [2004](#)) including borderline, schizotypal, dependent, and avoidant personality disorder symptoms; depressive and anxiety symptoms (Klonsky, Oltmanns, & Turkheimer, [2003](#); Muehlenkamp & Gutierrez, [2004](#); Ross & Heath, [2002](#)); childhood sexual abuse (Boudewyn & Liem, [1995](#); Briere & Gil, [1998](#); Briere & Runtz, [1986](#); Gratz, Conrad, & Roemer, [2002](#)); and suicidal ideation (Muehlenkamp & Gutierrez, [2004](#); Nada-Raja, Skegg et al., [2004](#)). The

following risk factors have been reported in one study only: peers perceiving the person as having strange and intense emotions and a sensitivity towards rejection (Klonsky, Oltmanns, & Turkheimer, 2003), disinhibitive and negative temperament traits (Klonsky, Oltmanns, & Turkheimer, 2003); greater repulsion by life (Muehlenkamp & Gutierrez, 2004); insecure attachment, childhood neglect, and dissociation (Gratz, Conrad, & Roemer, 2002). The evidence for a gender difference is equivocal, with studies showing either no gender difference (Briere & Gil, 1998; Klonsky, Oltmanns, & Turkheimer, 2003; Muehlenkamp & Gutierrez, 2004) or a female preponderance (Ross & Heath, 2002).

Prospective studies of differences and similarities between risk and protective factors for NSSI and SA do not exist. The aim of the present research was therefore to investigate whether risk and protective factors for future NSSI and SA were different. Previous cross-sectional studies have indicated that those with SA have more psychiatric symptoms and psychosocial problems as well as more suicidal ideation than those with NSSI. It was therefore hypothesized that higher scores on suicidal ideation, depression and bulimic symptoms would predict future SA to a greater extent than future NSSI. However, due to the paucity of studies no specific hypotheses could be formed regarding the differential prediction of NSSI versus SA from other factors. We therefore asked whether four other domains of risk and protective factors had a differential impact on future NSSI and SA, namely: parent and family factors; social support and integration; factors relating to the self; and sexuality. Moreover, the prevalence and stability of SA and NSSI will be investigated.

METHOD

Participants

Data for the present research stem from the second and third waves of data collection in the *Young in Norway Study* (Wichstrøm, 1999; Wichstrøm, 2000). In the first wave (1992; T0), students in grades 7 through 12 (ages 12 to 19 years) from 67 schools representative of high schools in Norway comprised the initial sample. The response rate was 97%. A random half of the students received questionnaires in the fall term and the other half in the spring term. Students who were initially tested in the spring term of their 8th grade or 11th grade, in their 9th grade, or in their 12th grade would in most cases have completed the 3-year track at their junior or senior high school 2 years later (1994; T1) and had therefore left school, and were not part of the longer follow-up. At T0 there were thus 4,399 students eligible for follow up at T1. The students filled out the questionnaire at school, 89% ($n = 3,906$) responded. Because the study was originally planned as a two-wave study, new informed consent had to be obtained at T1. Those consenting at T1 ($n = 3,507$; 90%) received questionnaires by mail at T2. Data were received from 2,924 participants (84%). The mean age of the participants at T1 was 16.5 years ($SD = 1.9$) and 22.1 years ($SD = 1.9$) at T2. Attrition was not selective according to type of self-injury. However, at T0 those who did not participate at T2 had slightly higher scores on some alleged risks compared to those who did participate at T2: high parental overprotection, $t(4,329) = 4.32$, $p < .01$, Cohen's $d = 0.15$; perceived loneliness, $t(4,353) = 3.28$, $p < .01$, Cohen's $d = 0.12$; and low physical self-concept, $t(4,375) = 2.68$, $p < .01$, Cohen's $d = 0.09$. More girls (72%) than boys (61%) from the original sample participated at T2, OR = 1.38, 95% CI: 1.26 - 1.51.

Measures

Self-Injury

Participants were initially asked if they had “Taken an overdose of pills or otherwise tried to harm yourself on purpose?” (*No, never; Yes, once; or Yes, several times*). They also answered the question “Have you ever tried to kill yourself?” (*No, not really; Yes, once; or Yes, several times*). Suicide attempters (SA) was defined as those with an affirmative answer to the latter question, whereas a group of non-suicidal self-injurers (NSSI) was formed from those with a positive answer about self-injury, but not about SA. At T0 only questions about SA were posed, and data from T0 are thus not part of the present analyses.

Parental Relations

Attachment to parents was measured by means of the Parental Bonding Instrument (Parker, Tupling, & Brown, [1979](#)), which yields two dimensions, *Care* ($\alpha = .77$) and *Overprotection* ($\alpha = .75$). Parental monitoring was measured with a six-item scale ($\alpha = .86$) (Olweus, 1989). The participants also indicated whether they lived with both their biological parents or not.

Self

A revised version of the Self-Perception Profile for Adolescents (Harter, [1988](#); Wichström, [1995](#)) was included, which has improved reliability and validity as compared to the original scale (Wichström, [1995](#)). The following subscales were included: Social Acceptance ($\alpha = .79$); Close Friends ($\alpha = .77$); Physical Appearance ($\alpha = .89$); and Global Self-Worth ($\alpha = .80$). Unstable self-concept was measured by a revised edition of Rosenberg's Stability of Self Scale (four items; $\alpha = .86$) (Alsaker & Olweus, [1993](#); Rosenberg, [1979](#)).

Sexuality

Same-sex sexual contact was measured by the question, “Have you had any form of sexual contact with a person of your own sex?” (*Yes/No*). Those indicating sexual contact with someone of their own sex when 12 years or older were considered as having had same-sex sexual contact. Those younger than 12 years at their first same-sex contact who did not repeat this when older were excluded ($N = 23$, 11 boys and 12 girls). Sexual attraction was measured by the question, “Are you sexually interested in men or in women (sexually attracted to, sexual fantasies about)?” with a 7-point scale. The participants were also asked to indicate when they realized that they were not exclusively heterosexually interested. Those who had same-sex-sexual contacts before T1 or had been aware of their same-sex sexual interest before T1 were classified as having non-heterosexual sexual interest. The participants indicated if they ever had sexual intercourse and the age of sexual debut. Those who were 15 years of age or younger at debut (15%) were considered as having an early debut.

Symptoms and Problems

The adolescents rated their involvement in 13 different types of antisocial or illegal behavior the previous 12 months on a 6-point scale ranging from *Never* to *50 + times*. In order to

capture the more serious end of the conduct problem spectrum only participation with intensity at hypothetical clinically meaningful levels was included. The list comprised both covert and overt behaviors ranging from participation with high frequency in minor rule violations (e.g., “skipped school”; 50 + times) via serious behavior problems (e.g., “bullied or intimidated others”; 10 + times) to severe conduct problems (“attacked and stolen from someone” or “tortured or tormented animals”; 2 + times). Depressed mood was measured by the Depressive Mood Inventory ($\alpha = .80$) (Kandel & Davies, 1982). Suicidal ideation was measured by requesting the respondents to indicate on a 4-point scale how often they had been bothered or troubled by “thoughts about ending your own life.” Eating problems were measured by a 12-item version of the Eating Attitudes Test (Garner, Olmsted, Bohr et al., 1982; Lavik, Clausen, & Pedersen, 1991) ($\alpha = .79$). In addition, The Bulimic Investigatory Test - Edinburgh (BITE) (Henderson & Freeman, 1987) was included. The BITE consists of two sub-scales, namely the Symptom Scale ($\alpha = .84$) and the Severity Scale ($\alpha = .72$). The respondents were asked to indicate their use of each of four substances, on a 6-point scale: cannabis, solvents, “hard” drugs, and “drunk so much that you felt clearly intoxicated” during the preceding 12 months. These four scores were standardized and a sumscore was computed ($\alpha = .65$).

Social Support and Integration

We developed a measure of social support in young people that was modeled after Sarason, Levine, Basham et al., 1983). The measure asks for availability of the following social support persons: mother, father, boyfriend/girlfriend, sibling(s), friend(s), relative(s), neighbor(s), and others, respectively. Rating is performed in five situations: three emotionally oriented, and two instrumental. A summed score for average number of support persons ($\alpha = .79$) and a summed score for average satisfaction ($\alpha = .76$) were computed. Loneliness was measured with a brief version of the UCLA Loneliness Scale (five items; $\alpha = .72$) (Russell, Peplau, & Cutrona, 1980). The adolescents were asked to think of their two best friends and to rate whether neither, one or both of them got drunk at least once a week, were regular smokers, had ever used cannabis or had ever been in trouble with the police because of criminal behavior. An index of peers' problem behavior was computed as the sum of these scores.

PROCEDURE

Every student gave his/her consent in writing based both on an oral and written description of the project formulated according to the standards prescribed by the Norwegian Data Inspectorate. A written informed consent was also obtained from the parents of students below the age of 15. The study was approved by the Regional Research Ethical Committee for South and East Norway. The students were instructed to place the completed questionnaires in an envelope and to seal it themselves. At T2 participants received the questionnaire by mail. Those not responding within 4 weeks were mailed another questionnaire with a reminder letter.

Analysis

Bi-variate associations between self-injurious behavior and risk and protective factors were tested with Chi-square and logistic regression in the case of categorical variables. In the case

of continuous variables ANOVA was used and post-hoc testing was performed with Dunnett's C, which do not assume equal variances. Due to the large number of risk and protective factors, potential multivariate predictors of future self-injurious behavior were investigated blockwise as a first step. Risk and protectors were groups into the following six blocks: parents; self; sexuality; symptoms and problems; and social support and integration. Multinomic logistic regressions were run for each block predicting self-injurious behavior at T2 while controlling for age, gender and self-injurious behavior at T1. Variables at T1 that were multivariately predictive within its block were subjected a combined model of self-injurious behavior. Since no a-priori theoretical model is presented, an explorative analysis was performed in which the model was trimmed backward according to the change in -2 log likelihood of the model if the variable in question was removed.

RESULTS

Cross-Sectional Findings

The sample consisted of slightly more girls (56.0) than boys. At T1 virtually everybody was in education (99.7%), whereas at T2 45.4% were in education, 43.5% considered themselves to work, 2.5% were unemployed, 3.5% were at home, and 5.1% were in the military. At T1 the majority (93.3%) lived with one or both of their parents, but at T2 this was reduced to 29.8%, while 25.7% lived with a spouse or partner, 17.1% lived on their own, 19.4% shared a house or apartment with others, and 8.0% had other living arrangements.

At T1 2.4% ($N = 71$) reported previous NSSI, whereas 4.5% reported previous SA ($N = 133$). Multiple incidents of NSSI was reported by 14.1% of participants with NSSI, 10/71, whereas 33.8% of participants with SA reported multiple incidents, 45/133. The mean number of years since the last episode of NSSI was 1.15 years ($SD = 1.39$, range: 0-6.33) and 1.59 years since the last SA ($SD = 1.44$, range: 0-7.00). Girls reported more often NSSI, 3.3% vs. 1.3%, $\chi^2(2) = 40.20$, $p < .0001$ and SA, 6.4% vs. 2.2%, $\chi^2(2) = 28.25$, $p < .0001$ than boys, but there was no gender difference in the propensity to engage in NSSI versus SA. Those who stated non-heterosexual sexual interest (5.7%) reported NSSI (5.4%) or SA (12.7%) more often compared to heterosexual adolescents, 4.1% and 2.2%, respectively, $\chi^2(2) = 34.22$, $p < .0001$, but the NSSI and SA groups were not different with respect to sexual interest. Early sexual debut (18.4%) implied increased risk for NSSI (5.4%) or SA (12.3%) as compared to not having such an early debut (1.9% and 3.1%, respectively), $\chi^2(2) = 94.33$, $p < .0001$. Students who did not live with both their biological parents (27.7%) more often reported NSSI or SA, 3.6% and 6.9%, respectively, than those who lived with both their parents, 2.0% and 3.6%, respectively, $\chi^2(2) = 21.39$, $p < .0001$.

The NSSI and SA groups generally had lower scores on protective factors and higher scores on risk factors than the no self-injury group (Table 1). The SA group did only differ from the NSSI group with respect to Global Self-Worth (lower) and suicidal ideation (higher).

TABLE 1. Mean Level of Risk and Protective Factors at T1 among Subjects with No Self-Injury, NSSI, or SA. Cross-Sectional Analyses

Risk or protective factor	No self-injury $n = 2,720$	NSSI $n = 77$	SA $n = 133$	SD	df	F-value
---------------------------	-------------------------------	------------------	-----------------	----	----	---------

Note: NSSI = Non-suicidal self-injury, SA = Suicide Attempt.

^aNo self-injury significantly different from both NSSI and SA

^bNSSI group significantly different from SA

^cNo self-injury significantly different from SA, but not different from NSSI.

** $p < .01$

*** $p < .001$

Age	16.49	16.68	16.36	1.90	2,869	0.66
Parental monitoring	4.86 ^a	4.40	4.23	0.94	2,738	35.68***
Attachment to parents: Care	3.14 ^a	2.93	2.73	0.55	2,756	41.00***
Attachment to parents: Overprotection	2.00	2.16	2.28 ^c	0.57	2,768	18.14***
Self-concept						
Unstable	4.78 ^a	2.71	2.92	0.70	2,772	28.97***
Romantic appeal	2.70	2.74	2.73	0.58	2,743	0.42
Close friends	3.29	3.23	3.31	0.59	2,767	0.52
Social acceptance	3.17	3.12	3.02 ^c	0.51	2,773	6.04**
School competence	2.95 ^a	2.67	2.61	0.54	2,770	33.18***
Athletic competence	2.54	2.37	2.31 ^c	0.68	2,770	9.34***
Physical appearance	2.68 ^a	2.40	2.20	0.69	2,776	35.88***
Global self-worth	2.99 ^a	2.72 ^b	2.48	0.55	2,772	62.28***
Substance use score	-0.04 ^a	0.57	0.53	0.69	2,850	69.10***
Conduct problem score	0.22	0.41	0.78 ^c	0.96	2,814	23.34***
Depressive mood	1.71 ^a	2.20	2.44	0.58	2,756	137.07
Suicidal ideation	1.10 ^a	1.54 ^b	2.13	0.52	2,849	333.06***
Eating Attitudes Test score	1.59 ^a	1.81	1.84	0.38	2,880	38.73***
Bulimic Investigatory Test—Edinburgh total score	1.63 ^a	1.77	1.87	0.30	2,861	49.54***
Bulimic Investigatory Test—Edinburgh severity score	1.15 ^a	1.24	1.29	0.17	2,894	57.84***
UCLA Loneliness Scale score	1.80 ^a	2.06	2.18	0.56	2,770	36.31***
Friends' conduct problems	1.06	2.31	2.21	1.60	2,830	51.66***
Number of social support persons score	12.45	11.49	10.91 ^c	5.06	2,880	6.99***
Satisfaction with social support score	3.49	3.37	3.37 ^c	0.45	2,680	9.19***

Prospective Findings

In all 2.2% ($N = 65$) reported NSSI that occurred during the follow-up period and 3.2% ($N = 94$) reported SA. Among the 71 participants that reported NSSI at T1 7 (9.9%) also reported NSSI during follow-up (OR = 5.27, 95% CI:2.32-12.00), and 33 of the 133

participants (24.8%) who reported SA at T1 reported SA during follow-up (OR = 14.77, CI:9.25-23.59). Among the participants with NSSI during follow-up, 70.8% ($N = 46$) did not report any self-injury at T1, 10.8% ($N = 7$) reported previous NSSI, and 18.4% ($N = 12$) reported SA at T1. With respect to participants with SA during follow-up, 59.6% ($N = 56$) had no prior self-injury, 5.3% ($N = 5$) NSSI at T1, and 35.1% reported SA at T1, χ^2 ($df = 4$) = 270.41, $p < .0001$. The cumulative proportion of participants reporting NSSI at T1 and/or T2 was therefore 4.9% ($n = 142$), and the respective figure for SA was 8.7% ($n = 253$). Among those reporting NSSI during follow-up, 36.9% had multiple incidents of NSSI, 24/65, whereas the comparable figure for SA was 36.2%, 34/94.

Girls more often reported NSSI (2.7%) and SA (4.6%) during the follow-up period than boys (1.7% and 1.5%, respectively), $\chi^2(1) = 25.62$, $p < .0001$. Those who reported NSSI or SA during the follow up, were about 3 months younger than those who did not report NSSI or SA, 15.27 years old versus 15.50 years old, $F = 2.23$, $df = 13$, $p < .01$.

Table 2 show associations between continuous risk and protective factors at T1 and NSSI and SA, respectively, during the follow-up period. As can be seen, those who reported SA in the follow-up period had higher risk scores at T1 as compared to those who reported NSSI with respect to unstable self-concept, suicidal ideation, loneliness, and parental overprotection. The SA group also scored lower on parental care as compared to the NSSI group.

TABLE 2. Mean Level of Risk and Protective Factors at T1 among Subjects with No Self-Injury, NSSI, or SA during Follow-Up

Risk or protective factor	No self-injury $n = 2,765$	NSSI $n = 65$	SA $n = 94$	df	F
Age	16.51 ^a	16.00	15.96	2,867	5.91**
Parental monitoring	4.84	4.63	4.40 ^c	2,468	11.01***
Attachment to parents: Care	3.13	3.00	2.74 ^{b,c}	2,479	24.31***
Attachment to parents: Overprotection	2.00	2.05	2.34 ^{b,c}	2,489	15.26***
Self-concept					
Unstable	2.48	2.73	2.99 ^{b,c}	2,457	26.72***
Romantic appeal	2.71 ^a	2.61	2.49	2,453	7.18***
Close friends	3.29	3.23	3.21	2,479	1.15
Social acceptance	3.17	3.07	2.93 ^c	2,494	11.55***
School competence	2.94 ^a	2.69	2.65	2,483	19.04***
Athletic competence	2.54 ^a	2.32	2.24	2,492	11.55***
Physical appearance	2.67 ^a	2.42	2.18	2,477	26.92***
Global self-worth	2.98 ^a	2.67	2.46	2,482	48.64***
Body areas satisfaction	3.48 ^a	3.23	3.03	2,511	26.21***

Note: Scale ranges in parenthesis. NSSI = Non-suicidal self-injury, SA = Suicide attempt.

^aNo self-injury significantly different from both NSSI and SA groups

^bNSSI group significantly different from SA

^cNo self-injury significantly different from SA, but not different from NSSI.

** $p < .01$

*** $p < .001$.

Perceived obesity	2.90	3.00	3.17 ^c	2,862	8.24 ^{***}
BMI	20.96	20.92	20.63	2,837	0.55
Perceived pubertal timing	3.79	3.69	3.63	2,868	1.20
Substance use score	-0.02 ^a	0.31	0.18	2,850	12.61 ^{**}
Conduct problem score	0.23	0.55	0.52	2,812	7.45 ^{***}
Depressive mood	1.73 ^a	2.15	2.27	2,462	56.62 ^{***}
Suicidal ideation	1.12 ^a	1.55	1.93 ^b	2,759	136.46 ^{***}
Eating Attitudes Test score	1.59 ^a	1.74	1.87	2,878	27.75 ^{***}
Bulimic Investigatory Test— Edinburgh total score	1.63 ^a	1.77	1.88	2,859	37.12 ^{***}
Bulimic Investigatory Test— Edinburgh severity score	1.15 ^a	1.21	1.30	2,892	36.58 ^{***}
UCLA Loneliness Scale score	1.81 ^a	2.01	2.24 ^b	2,376	30.62 ^{***}
Number of social support persons score	12.43 ^a	10.80	11.16	2,886	6.03 ^{**}
Satisfaction with social support score	3.49 ^a	3.24	3.40	2,678	11.11 ^{***}

Multivariate Prospective Relations

Multinomial logistic regressions were run for each of the five blocks of risk and protective factors controlling for age, gender and self-injury at T1. Among the parental variables low parental care at T1 predicted self-injury at T2, difference in -2 log likelihood if removed from the model ($\Delta \chi^2 = 10.67, p < .01$); among the measures of the self, unstable self-concept, $\Delta \chi^2 = 8.93, p < .05$ and global self-worth $\Delta \chi^2 = 9.01, p < .05$ were predictive; within the sexuality block early sexual debut, $\Delta \chi^2 = 9.03, p < .01$, and non-heterosexual sexual interest, $\Delta \chi^2 = 36.32, p < .001$ were predictive; from the symptoms and problems conduct problems, $\Delta \chi^2 = 6.56, p < .05$, depressive mood, $\Delta \chi^2 = 12.37, p < .01$, and suicidal ideation, $\Delta \chi^2 = 13.04, p < .001$ were predictive; and within the social support and integration domain loneliness, $\Delta \chi^2 = 20.12, p < .001$, the number of friends with conduct problems, $\Delta \chi^2 = 11.97, p < .01$, and satisfaction with social support, $\Delta \chi^2 = 6.65, p < .05$ did predict self-injury during follow-up. These significant risk and protective factors were therefore entered jointly into a multinomial logistic regression. A final model after excluding variables according to the difference in -2 log likelihood between the original model and the trimmed model is presented in Table 3. The precision of this model in predicting future self-injury was moderate, Nagelkerle pseudo R-square = 0.32, but represented a clear improvement over and beyond a model with only previous self-injurious behavior, Nagelkerle pseudo R-square = 0.18.

TABLE 3. Risk and Protective Factors at T1 Predicting NSSI and SA during Follow-Up. Multivariate Nominal Regression

Risk and protectors at T1	Type of self-injurious behavior during follow-up		Δ of -2 log-likelihood if removed	
	NSSI (<i>n</i> = 56)	SA (<i>n</i> = 72)	OR	95%CI
	OR	95%CI	OR	95%CI

Note: No self-injury is contrast. Scale ranges in parenthesis. NSSI = Non-suicidal self-injury, SA = Suicide Attempt.

^aatom or higher than the or for the other self-injury category.

$p < .05$

.

* $p < .05$

,

** $p < .01$

,

*** $p < .001$.

Suicidality (Contrast = No self-injury, $n = 2,010$)

55.06***

NSSI	4.62 ^a	1.98-10.86	1.16	0.36-3.87	
SA	4.30	1.95-9.50	7.49	4.13-13.59	
Age (years)	0.86	0.74-1.00	0.94	0.83-1.07	4.63
Gender (girl)	1.99	1.04-3.79	2.25	1.25-4.06	11.49**
Parental care (1-6)	1.27 ^a	0.76-2.12	0.57	0.38-0.86	9.06**
Global Self-Worth (1-4)	0.52	0.32-0.86	0.45	0.29-0.71	16.64***
Non-heterosexual sexual interest	4.06	1.95-8.47	6.81	3.70-12.55	38.77***
Early sexual debut	1.97	1.13-3.40	1.44	0.86-2.39	6.48*
Conduct problems	2.87	0.77-10.74	4.52	1.64-12.47	8.37*
Suicidal ideation (1-4)	1.25	0.85-1.82	2.00 ^a	1.51-2.67	21.36***
Satisfaction with social support (1-4)	0.53	0.30-0.94	1.31 ^a	0.77-2.20	6.34*

Previous suicidality, suicidal ideation and non-heterosexual sexual interest added most to this model. In addition, parental care, global self-worth and satisfaction with social support protected against later self-injury whereas female gender, early sexual debut, and conduct problems predicted self-injurious behavior. Risk and protective factors that were common to NSSI and SA were being female, previous SA, global self-worth and non-heterosexual sexual interest. Apart from these common risk factors, risk and protective factors for NSSI and SA did differ. Previous NSSI and early sexual debut acted as specific risk factors for later NSSI whereas satisfaction with social support protected against later NSSI. As can be seen, the effects of satisfaction with social support and previous NSSI on later NSSI were significantly stronger than on later SA. Risk factors that were specific to future SA were suicidal ideation and conduct problems, whereas parental care protected against future SA. The effects of suicidal ideation and parental care were significantly stronger with respect SA than with respect to NSSI.

Although depressive mood was a strong predictor of later self-injurious behavior within the block consisting of symptoms and problems, it did not multivariately predict later self-injury. This may, in part be due to its effect being mediated by suicidal ideation. The correlation between depressive mood and suicidal ideation was 0.40, and when suicidal ideation was removed from the final model, depressive mood predicted self-injurious behavior, $\Delta \chi^2 = 7.07$, $p < .05$. The effect of previous self-injurious behavior on later self-injurious behavior increased with increasing age, $\Delta \chi^2 = 22.96$, $p < .001$, but no other interaction emerged.

DISCUSSION

The present study is the first to provide data that address whether the predictors of future suicide attempts and future non-suicidal self-injury are the same or different. In this 5-year follow-up of Norwegian adolescents and young adults, the results showed that both future SA and NSSI were multivariately predicted by being female, previous SA and non-heterosexual sexual interest. However, the principal finding of this study was that the unique effects of other predictors were multivariately specific to either form of self injury. Previous NSSI increased the risk for later NSSI whereas satisfaction with social support protected against it. SA, however, was predicted by suicidal ideation, unstable self concept, and conduct problems, whereas parental care protected against later SA.

Prevalence

The prevalence of self-reports of ever having a SA was almost twice that of NSSI (8.7% versus 4.9%). The rates of NSSI in this study was thus similar to the rates found in U.S. Air Force recruits (Klonsky, Oltmanns, & Turkheimer, [2003](#)) and in the general population (Briere & Gil, [1998](#)) but lower than in a study of US high school students (Ross & Heath, [2002](#)). The prevalence of suicidal behaviors are subject to secular changes, and non-fatal suicidal behavior has been shown to have increased among females in Norway during the latter decade (Rossow, Grøholt, & Wichstrøm, 2005), thus the prevalence in the population at present might be closer to the figure reported for US high school students. However, similar to Ross and Heath (Ross & Heath, [2002](#)), the F:M ratio of NSSI was 2:1. Although some have indicated that the increased risk for self-injury among females is attributed to their greater accumulation of risk factors, particularly depression (Wichstrøm & Rossow, [2002](#)), this was not supported in the present study, in which female gender was a unique risk factor even when other potential risk and protective factors were controlled.

It should be noted that NSSI did not multivariately predict future SA, which suggests that NSSI should not be viewed as the first step in a potential escalation towards more severe forms of suicidality (Muehlenkamp, [2005](#)). The findings of the present study support the stance that when persons who engage in NSSI later try to commit suicide, as they are at increased risk for, it may be attributed to their increased level of other risk factors for SA, and possibly also the psychological pain that is inherent in some of these risk factors (Favazza, [1998](#)).

One fourth of the participants did repeat an SA during follow-up, whereas NSSI was a more transient phenomenon in this sample, with only 10% continuing with it during follow-up. The course of SA and NSSI thus seem somewhat different. These data therefore give initial support to the notion of a separate non-suicidal self-injury syndrome (Muehlenkamp, [2005](#)). However, repetitive or severe NSSI may be present in only a minority of those who report NSSI in community samples.

Unique Risk and Protective Factors for NSSI and SA

The hypothesis that higher suicidal ideation and higher scores on depression and eating problems would predict SA to a greater extent than NSSI was not fully supported. Suicidal ideation was uniquely related to later SA. However, depression and bulimic symptoms were not related to future SA. The present study did support other community studies (Nock & Kessler, [2006](#); Wong, Stewart, & Lam, [2007](#)), but not a clinical study (Grøholt, Ekeberg, & Haldorsen, [2000](#)), by finding conduct problems to predict SA but not NSSI (albeit not differentially so). It should be remembered that previous research on the difference between

NSSI and SA was not prospective, and some were even not multivariate. Findings from such studies are only indicative of risk and protective factors (Kraemer, Kazdin, Offord et al., [1997](#)). An unstable self-concept is among the defining features of Borderline Personality Disorder as is self-injurious behavior (American Psychiatric Association, [1994](#)). In the present study unstable self-concept predicted SA, but not NSSI. Moreover, at a bi-variate level, the instability of self-concept scores of the NSSI and the no self-injury groups were similar. Hence, an unstable self-concept emerged as a unique risk factor for SA. Possibly, the sudden swings in self-esteem, world outlook, and mood inherent in such instability may, when faced with distress, increase the risk of deciding to end one's life and therefore engaging in activities that might be fatal, whereas a stronger sense of continuity of self may increase the possibility of deciding to cope with the psychological pain, albeit adopting self-hurting measures. Perceived parental overprotection has been found to be cross-sectionally associated with suicide attempt in clinical samples (Yamaguchi, Kobayashi, Tachikawa et al., [2000](#)). With respect to insecure attachment, it has only been addressed once as a risk factor for NSSI, and received only partial support (Gratz, Conrad, & Roemer, [2002](#)). It has been suggested that such insecure attachment may increase the risk for self-injurious behavior by fostering negative expectations about self and the world (Yates, [2004](#)). Moreover, secure attachment may act as a buffer against the negative effects of adverse life events and losses (Gratz, [2003](#)). However, poor relation to parents might also increase the risk of immediately precipitating factors to suicide attempt. Among younger adolescents, parent-child conflict is among the most prevalent precipitating events for attempted suicide (Beautrais, Joyce, & Mulder, [1997](#)), whereas relationship problems with a romantic partner, in particular break-ups, are more frequent precipitating factors among older adolescents (Gould, Greenberg, Velting et al., [2003](#)). Poor relations to one's parents might therefore be hypothesized to increase the probability of parent-child quarrels, especially on autonomy topics, thereby increasing the risk for suicide attempt. Insecure attachment during adolescence has been found to predict problems and conflict in romantic relationships in early adulthood (Collins, Cooper, Albino et al., [2002](#)). Moreover, among older adolescents and young adults, insecure attachment is correlated with more distress after break-up with partner as well as more maladaptive coping reactions (Davis, Shaver, & Vernon, [2003](#)). Although not yet tested, suicide attempt might be one of the maladaptive ways to cope with relationship problems. It is not yet known if such negative life-events serve as risk factors for NSSI. At present there is thus no ready explanation for why parental care protects against the risk for suicide attempt, but not against NSSI.

Satisfaction with social support protected against NSSI but not against SA. Low satisfaction may be due to the perception that social support figures are lacking or that they are not able to fulfill the needs of the person. Although NSSI may have several functions, many scholars agree that some individuals may retreat to NSSI as a means to alleviate anxious or hostile feelings when they have no other available way to cope with these feelings (Bennum, [1984](#); Nock & Prinstein, [2005](#)). Perceiving the utility of other ways of coping with distress, such as turning to social support figures, as limited may hence increase the risk of adopting NSSI as a coping mechanism when negative feelings exceed the current coping resources of the person.

Common Risk and Protective Factors

Previous reports from the present data set have shown that non-heterosexual sexual interest is a risk factor for SA (Groholt, Ekeberg, & Haldorsen, 2000; Groholt, Ekeberg, Wichstrøm et al., [2000](#); Wichstrøm & Hegna, 2003). The present study showed that it also increases the risk for NSSI. Although the statistical association between homosexuality and SA has been

documented in several community studies, there is no theoretically meaningful explanation for this relationship. The vast majority of those who report non-heterosexual sexual interest in this and other studies do so within a context of a predominant heterosexual identity and heterosexual practices, i.e., the person has had one or a few same-sex sexual experiences or is “somewhat” attracted to the same sex. It is most unlikely that these sexual experiences or attractions in themselves increase the risk for self-injury. Rather, such experimental sexuality may be a marker of other risk factors. Impulsive young people are more likely to have an earlier heterosexual debut and to engage in homosexual behavior (Bancroft, Janssen, Strong et al., 2003; Hoyle, Fejfar, & Miller, 2000). Impulsivity is also a risk factor for suicide attempt (Joiner, Brown, & Wingate, 2005), and NSSI has first and foremost been characterized as an impulse control disorder (Favazza, 1998). Hence, it may be impulsivity, and not sexuality, that is the risk factor for self-injurious behavior. However, early sexual debut, as well as same-sex sexuality, may increase the risk of known precipitating events to self-injury such as relationship difficulties and thereby serve as a true risk factor.

The temporal discontinuity of NSSI, the fact that two-thirds of those who reported NSSI had only one incident of NSSI, and the age gradient all suggest the following general picture: In most cases NSSI is a behavior that some young people, predominantly girls, may retreat to during early or middle adolescence at one or some occasions, but seldom use for an extended period. This is in contrast to suicide attempt, which has been found to have greater continuity by being the most potent predictor of future attempts (Hulten, Jiang, Wasserman et al., 2001; Joiner, Conwell, Fitzpatrick et al., 2005) and actual death by suicide (Grøholt, Ekeberg, Wichstrøm et al., 1997).

Limitations

Although suicide attempt is defined as an effort to take one's life, a variety of motives for the attempt may be involved. Previous research shows that not more than two-thirds of suicide attempters in clinical samples endorse that they wanted to die from the attempt (Boergers, Spirito, & Donaldson, 1998), and even a smaller proportion should be expected in population samples. The present suicide attempters most likely form a heterogeneous group, varying with respect to intent, motives, and lethality of the attempt. This heterogeneity does not invalidate the present findings, but increases the risk of Type II error. It may thus be differences between serious suicide attempters and those involved in NSSI that are not detected. In a similar vein, there might be important differences between habitual self-harmers, occasional self-harmers, and suicide attempters which are not captured in the present study. The WHO/EURO multicenter study of parasuicide's definition of parasuicide (Platt, Billebrahe, Kerkhof et al., 1992), and excluding those with a suicide attempt, was adopted as a measure of deliberate self-harm. Although the definition covers all types of deliberate self-harm, the definition specifically mentions overdose from medications, whereas other typical modes of deliberate self-harm such as cutting or burning are not mentioned. This may have led some self-harmers such as cutters not to reply positively to the question. This is a weakness of the study. The present findings may thus not apply to all suicide attempters and self-harmers, in particular not to patient populations, and possibly also not to some types of self-harmers with moderate to minor tissue damage at each self-harm occasion. Moreover, for some participants the self-injury dated back several years and the recollection of such incidences may have produced recollection bias. Recall of factual behavior, such as self-injury, is possibly more accurate and stable than recall of inner states, such as the intention of the self-injury. Recall is partly mood-state dependent (Eich, Macaulay, & Ryan, 1994) and participants with current suicidal ideation may therefore have been more prone to label a previous factual act of self-injury as a

SA as opposed to a NSSI. This may have led to an overestimation of the relationship between SA and suicidal ideation. Moreover, several constructs were measured with only one item (e.g., sexual debut), and the reliability of such single-item measures is difficult to obtain and the reliability is therefore uncertain.

The current data was only obtained through self-report, and it is thus possible that correlations between self-injury and predictor variables in part reflect a common method variance.

However, this is expected to be a lesser problem, when changes in self-injurious behavior are addressed, such as in the present study. However, structured psychiatric interviews may have provided more accurate estimates of disorder and hence stronger findings.

Conclusions

The issue of whether deliberate self-harm without suicidal intent forms a specific syndrome separate from suicide attempt is an important one because it has implications for nosological reasons, but even more so for how we try to prevent and treat self-harm. By means of comparing NSSI and SA some researchers have reached the conclusion that albeit NSSI and SA share several risk factors there are enough differences between the two groups to warrant considering NSSI and SA to be partly separate phenomena (Muehlenkamp & Gutierrez, 2004). Others have found that although some risk factors distinguish NSSI and SA they share enough risk factors to consider them to represent a continuum of risk (Wong, Stewart, & Lam, 2007). This may be a discussion of whether the glass is half empty or half full. The present study is the first to study this issue both prospectively and multivariately, which is the proper way to address true risk factors and not just putative risk factors (Kraemer, Kazdin, Offord et al., 1997). The principal finding is that some risk and protective factors seem to be common to NSSI and SA whereas others are specific to each self-injury category. Satisfaction with social support protected against NSSI. High scores on pathology, however, increased the risk of SA, namely suicide ideation, conduct problems, and unstable self-perception. Importantly, NSSI was not a prospective risk factor for SA when other risk and protective factors are controlled. This fact indicates that suicide attempt should not be seen as an escalation of deliberate self-harm. Future prospective studies are needed to answer the question concerning the distinctiveness of NSSI and SA more fully.

Acknowledgments

This research was supported by a grant from the Norwegian Research Council (#169549)

REFERENCES

- 1. Alsaker, F. D. and Olweus, D. (1993) Global self-evaluations and perceived instability of self in early adolescence—a cohort longitudinal-study. *Scandinavian Journal of Psychology* **34**:1, pp. 47-63.
- 2. (1994) *Diagnostic and statistical manual of mental disorders (fourth edition)* American Psychiatric Association, Washington DC — American Psychiatric Association
- 3. Bancroft, J., Janssen, E. Strong, D. et al. (2003) Sexual risk-taking in gay men: The relevance of sexual arousability, mood, and sensation seeking. *Archives of Sexual Behavior* **32**:6, pp. 555-572.
- 4. Beautrais, A. L., Joyce, P. R. and Mulder, R. T. (1997) Precipitating factors and life

events in serious suicide attempts among youths aged 13 through 24 years. *Journal of the American Academy of Child and Adolescent Psychiatry* **36**:11 , pp. 1543-1551.

- 5. Bennum, I. (1984) Psychological models of self-mutilation. *Suicide and Life-Threatening Behavior* **14**:3 , pp. 166-186.
- 6. Boergers, J., Spirito, A. and Donaldson, D. (1998) Reasons for adolescent suicide attempts: Associations with psychological functioning. *Journal of the American Academy of Child and Adolescent Psychiatry* **37**:12 , pp. 1287-1293.
- 7. Boudewyn, A. C. and Liem, J. H. (1995) Childhood sexual abuse as a precursor to depression and self-destructive behavior in adulthood. *Journal of Traumatic Stress* **8**:3 , pp. 445-459. [[crossref](#)]
- 8. Briere, J. and Gil, E. (1998) Self-mutilation in clinical and general population samples: Prevalence, correlates, and functions. *American Journal of Orthopsychiatry* **68**:4 , pp. 609-620. [[csa](#)] [[crossref](#)]
- 9. Briere, J. and Runtz, M. (1986) Suicidal thoughts and behaviors in former sexual abuse victims. *Canadian Journal of Behavioural Science-Revue Canadienne Des Sciences Du Comportement* **18**:4 , pp. 413-423.
- 10. Brown, M. Z., Comtois, K. A. and Linehan, M. M. (2002) Reasons for suicide attempts and nonsuicidal self-injury in women with borderline personality disorder. *Journal of Abnormal Psychology* **111**:1 , pp. 198-202. [[csa](#)] [[crossref](#)]
- 11. Christoffersen, M. N., Poulsen, H. D. and Nielsen, A. (2003) Attempted suicide among young people: risk factors in a prospective register based study of Danish children born in 1966. *Acta Psychiatrica Scandinavica* **108**:5 , pp. 350-358. [[csa](#)] [[crossref](#)]
- 12. Collins, N. L., Cooper, M. L. Albino, A. et al. (2002) Psychosocial vulnerability from adolescence to adulthood: A prospective study of attachment style differences in relationship functioning and partner choice. *Journal of Personality* **70**:6 , pp. 965-1008. [[csa](#)]
- 13. Davis, D., Shaver, P. R. and Vernon, M. L. (2003) Physical, emotional, and behavioral reactions to breaking up: The roles of gender, age, emotional involvement, and attachment style. *Personality and Social Psychology Bulletin* **29**:7 , pp. 871-884. [[csa](#)] [[crossref](#)]
- 14. Eich, E., Macaulay, D. and Ryan, L. (1994) Mood dependent memory for events in the personal past. *Journal of Experimental Psychology-General* **123**:2 , pp. 201-215.
- 15. Evans, E., Hawton, K. and Rodham, K. (2004) Factors associated with suicidal phenomena in adolescents: A systematic review of population-based studies. *Clinical Psychology Review* **24**:8 , pp. 957-979. [[csa](#)] [[crossref](#)]
- 16. Favazza, A. R. (1998) The coming of age of self-mutilation. *Journal of Nervous and Mental Disease* **186**:5 , pp. 259-268. [[csa](#)]
- 17. Fergusson, D. M., Beautrais, A. L. and Horwood, L. J. (2003) Vulnerability and resiliency to suicidal behaviours in young people. *Psychological Medicine* **33**:1 , pp. 61-73. [[csa](#)]
- 18. Garner, D. M., Olmsted, M. P. Bohr, Y. et al. (1982) The Eating Attitudes Test—Psychometric features and clinical correlates. *Psychological Medicine* **12**:4 , pp. 871-878.
- 19. Gould, M. S., Greenberg, T. Velting, D. M. et al. (2003) Youth suicide risk and preventive interventions: A review of the past 10 years. *Journal of the American Academy of Child and Adolescent Psychiatry* **42**:4 , pp. 386-405.
- 20. Gratz, K. L. (2003) Risk factors for and functions of deliberate self-harm: An empirical and conceptual review. *Clinical Psychology-Science and Practice* **10**:2 , pp.

192-205.

- 21. Gratz, K. L., Conrad, S. D. and Roemer, L. (2002) Risk factors for deliberate self-harm among college students. *American Journal of Orthopsychiatry* **72**:1 , pp. 128-140. [[csa](#)] [[crossref](#)]
- 22. Grøholt, B., Ekeberg, Ø. and Haldorsen, T. (2000) Adolescents hospitalised with deliberate self-harm: the significance of an intention to die. *European Child & Adolescent Psychiatry* **9**:4 , pp. 244-254.
- 23. Grøholt, B., Ekeberg, O. Wichstrøm, L. et al. (1997) Youth suicide in Norway, 1990-1992: A comparison between children and adolescents completing suicide and age- and gender-matched controls. *Suicide and Life-Threatening Behavior* **27**:3 , pp. 250-263.
- 24. Grøholt, B., Ekeberg, O. and Wichstrøm, L. (1998) Characteristics of young suiciders and suicide attempters. *Nordic Journal of Psychiatry* **52** , pp. 96-97.
- 25. Grøholt, B., Ekeberg, O. Wichstrøm, L. et al. (2000) Young suicide attempters: A comparison between a clinical and an epidemiological sample. *Journal of the American Academy of Child and Adolescent Psychiatry* **39**:7 , pp. 868-875.
- 26. Harter, S. (1988) *Manual for the self-perception profile for adolescents* University of Denver , Denver, CO
- 27. Henderson, M. and Freeman, C. P. L. (1987) A self-rating scale for bulimia the bite. *British Journal of Psychiatry* **150** , pp. 18-24. [[crossref](#)]
- 28. Hoyle, R. H., Fejfar, M. C. and Miller, J. D. (2000) Personality and sexual risk taking: A quantitative review. *Journal of Personality* **68**:6 , pp. 1203-1231. [[csa](#)]
- 29. Hulten, A., Jiang, G. X. Wasserman, D. et al. (2001) Repetition of attempted suicide among teenagers in Europe: frequency, timing and risk factors. *European Child & Adolescent Psychiatry* **10**:3 , pp. 161-169.
- 30. Johnson, J. G., Cohen, P. Gould, M. S. et al. (2002) Childhood adversities, interpersonal difficulties, and risk for suicide attempts during late adolescence and early adulthood. *Archives of General Psychiatry* **59**:8 , pp. 741-749. [[csa](#)] [[crossref](#)]
- 31. Joiner, T. E., Brown, J. S. and Wingate, L. R. (2005) The psychology and neurobiology of suicidal behavior. *Annual Review of Psychology* **56** , pp. 287-314. [[crossref](#)]
- 32. Joiner, T. E., Conwell, Y. Fitzpatrick, K. K. et al. (2005) Four studies on how past and current suicidality relate even when “everything but the kitchen sink” is covaried. *Journal of Abnormal Psychology* **114**:2 , pp. 291-303. [[csa](#)] [[crossref](#)]
- 33. Juon, H. S. and Ensminger, M. E. (1997) Childhood, adolescent, and young adult predictors of suicidal behaviors: A prospective study of African Americans. *Journal of Child Psychology and Psychiatry and Allied Disciplines* **38**:5 , pp. 553-563. [[csa](#)]
- 34. Kandel, D. B. and Davies, M. (1982) Epidemiology of depressive mood in adolescents—an empirical-study. *Archives of General Psychiatry* **39**:10 , pp. 1205-1212.
- 35. Klonsky, E. D., Oltmanns, T. F. and Turkheimer, E. (2003) Deliberate self-harm in a nonclinical population: Prevalence and psychological correlates. *American Journal of Psychiatry* **160**:8 , pp. 1501-1508. [[csa](#)] [[crossref](#)]
- 36. Kraemer, H. C., Kazdin, A. E. Offord, D. R. et al. (1997) Coming to terms with the terms of risk. *Archives of General Psychiatry* **54**:4 , pp. 337-343. [[csa](#)]
- 37. Lavik, N. J., Clausen, S. E. and Pedersen, W. (1991) Eating behavior, drug-use, psychopathology and parental bonding in adolescents in Norway. *Acta Psychiatrica Scandinavica* **84**:4 , pp. 387-390. [[crossref](#)]
- 38. Lewinsohn, P. M., Rohde, P. and Seeley, J. R. (1994) Psychosocial risk-factors for future adolescent suicide attempts. *Journal of Consulting and Clinical Psychology*

- 62:2 , pp. 297-305. [[crossref](#)]
- 39. Linehan, M. M. (1993) *Cognitive behavioral therapy of borderline personality disorder* Guilford Press , New York
 - 40. Lloyd-Richardson, E. E., Perrine, N. Dierker, L. et al. (2007) Characteristics and functions of non-suicidal self-injury in a community sample of adolescents. *Psychological Medicine* **37**:8 , pp. 1183-1192. [[crossref](#)]
 - 41. McKeown, R. E., Garrison, C. Z. Cuffe, S. P. et al. (1998) Incidence and predictors of suicidal behaviors in a longitudinal sample of young adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry* **37**:6 , pp. 612-619.
 - 42. Muehlenkamp, J. J. (2005) Self-injurious behavior as a separate clinical syndrome. *American Journal of Orthopsychiatry* **75**:2 , pp. 324-333. [[csa](#)] [[crossref](#)]
 - 43. Muehlenkamp, J. J. and Gutierrez, P. M. (2004) An investigation of differences between self-injurious behavior and suicide attempts in a sample of adolescents. *Suicide and Life-Threatening Behavior* **34**:1 , pp. 12-23.
 - 44. Nada-Raja, S., Skegg, K. Langley, J. et al. (2004) Self-harmful behaviors in a population-based sample of young adults. *Suicide and Life-Threatening Behavior* **34**:2 , pp. 177-186.
 - 45. Nock, M. K. and Kessler, R. C. (2006) Prevalence of and risk factors for suicide attempts versus suicide gestures: Analysis of the National Comorbidity Survey. *Journal of Abnormal Psychology* **115**:3 , pp. 616-623. [[csa](#)] [[crossref](#)]
 - 46. Nock, M. K. and Prinstein, M. J. (2005) Contextual features and Behavioral functions of self-mutilation among adolescents. *Journal of Abnormal Psychology* **114**:1 , pp. 140-146. [[csa](#)] [[crossref](#)]
 - 47. O'Carroll, P. W., Berman, A. L. Maris, R. W. et al. (1996) Beyond the Tower of Babel: A nomenclature for suicidology. *Suicide and Life-Threatening Behavior* **26**:3 , pp. 237-252.
 - 48. Olweus, D. Klein, M. (ed) (1989) *National research in self-reported crime and delinquency* pp. 187-201. Kluwer Academic Publishers , Dordrecht
 - 49. Owens, D., Horrocks, J. and House, A. (2002) Fatal and non-fatal repetition of self-harm—Systematic review. *British Journal of Psychiatry* **181** , pp. 193-199. [[csa](#)] [[crossref](#)]
 - 50. Parker, G., Tupling, H. and Brown, L. B. (1979) Parental Bonding Instrument. *British Journal of Medical Psychology* **52**:MAR , pp. 1-10.
 - 51. Platt, S., Billebrahe, U. Kerkhot, A. et al. Parasuicide in Europe—The WHO/EURO Multicenter Study on parasuicide. 1. Introduction and preliminary analysis for 1989. *Acta Psychiatrica Scandinavica* **85**:2 , pp. 97-104. [[crossref](#)]
 - 52. Reifman, A. and Windle, M. (1995) Adolescent suicidal behaviors as a function of depression, hopelessness, alcohol-use, and social support—a Longitudinal Investigation. *American Journal of Community Psychology* **23**:3 , pp. 329-354. [[csa](#)]
 - 53. Reinherz, H. Z., Giaconia, R. M. Silverman, A. B. et al. (1995) Early psychosocial risks for adolescent suicidal ideation and attempts. *Journal of the American Academy of Child and Adolescent Psychiatry* **34**:5 , pp. 599-611.
 - 54. Rosenberg, M. (1979) *Conceiving the self* Basic Books , New York
 - 55. Ross, S. and Heath, N. (2002) A study of the frequency of self-mutilation in a community sample of adolescents. *Journal of Youth and Adolescence* **31**:1 , pp. 67-77. [[crossref](#)]
 - 56. Rossow, I., Grøholt, B. and Wichstrøm, L. (2005) Intoxicants and suicidal behaviour among adolescents: changes in levels and associations from 1992 to 2002. *Addiction* **100**:1 , pp. 79-88. [[csa](#)] [[pubmed](#)] [[crossref](#)]
 - 57. Russel, D., Peplau, L. and Cutrona, C. (1980) The Revised UCLA Loneliness

Scale: Concurrent and discriminant validity evidence. *Journal of Personality and Social Psychology* **39**, pp. 472-480. [[crossref](#)]

- 58. Sarason, I. G., Levine, H. M. Basham, R. B. et al. (1983) Assessing social support—the Social Support Questionnaire. *Journal of Personality and Social Psychology* **44**:1, pp. 127-139. [[crossref](#)]
- 59. Skegg, K., Nada-Raja, S. and Moffitt, T. E. (2004) Minor self-harm and psychiatric disorder: A population-based study. *Suicide and Life-Threatening Behavior* **34**:2, pp. 187-196.
- 60. Stanley, B., Gameroff, M. J. Michalsen, V. et al. (2001) Are suicide attempters who self-mutilate a unique population?. *American Journal of Psychiatry* **158**:3, pp. 427-432. [[csa](#)] [[crossref](#)]
- 61. Stanley, B., Winchel, R. Molcho, A. et al. (1992) [Suicide and the self-harm continuum: phenomenological and biochemical evidence](#). *International Review of Psychiatry* **4**, pp. 149-155. [[informaworld](#)]
- 62. Wichström, L. (1999) The emergence of gender difference in depressed mood during adolescence: The role of intensified gender socialization. *Developmental Psychology* **35**:1, pp. 232-245. [[csa](#)] [[crossref](#)]
- 63. Wichström, L. (1995) [Hartners Self-Perception Profile for Adolescents—Reliability, validity, and evaluation of the question format](#). *Journal of Personality Assessment* **65**:1, pp. 100-116. [[informaworld](#)]
- 64. Wichström, L. (2000) Predictors of adolescent suicide attempts: A nationally representative longitudinal study of Norwegian adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry* **39**:5, pp. 603-610.
- 65. Wichström, L. and Hegna, K. (2003) Sexual orientation and suicide attempt: A longitudinal study of the general Norwegian adolescent population. *Journal of Abnormal Psychology* **112**:1, pp. 144-151. [[crossref](#)] [[csa](#)]
- 66. Wichström, L. and Rossow, I. (2002) Explaining the gender difference in self-reported suicide attempts: A nationally representative study of Norwegian adolescents. *Suicide and Life-Threatening Behavior* **32**:2, pp. 101-116.
- 67. Wilcox, H. C. and Anthony, J. C. (2004) The development of suicide ideation and attempts: an epidemiologic study of first graders followed into young adulthood. *Drug and Alcohol Dependence* **76**, pp. S53-S67. [[Addiction Abstracts](#)] [[crossref](#)] [[csa](#)]
- 68. Wong, J. P. S., Stewart, S. M. and Lam, T. H. (2007) Risk factors associated with suicide attempts and other self-injury among Hong Kong adolescents. *Suicide and Life-Threatening Behavior* **37**:4, pp. 453-466.
- 69. Yamaguchi, N., Kobayashi, J. Tachikawa, H. et al. (2000) Parental representation in eating disorder patients with suicide. *Journal of Psychosomatic Research* **49**:2, pp. 131-136. [[crossref](#)] [[csa](#)]
- 70. Yates, T. M. (2004) The developmental psychopathology of self-injurious behavior: Compensatory regulation in posttraumatic adaptation. *Clinical Psychology Review* **24**:1, pp. 35-74. [[crossref](#)] [[csa](#)]

List of Tables

TABLE 1. Mean Level of Risk and Protective Factors at T1 among Subjects with No Self-Injury, NSSI, or SA. Cross-Sectional Analyses

Risk or protective factor	No self-injury <i>n</i> = 2,720	NSSI <i>n</i> = 77	SA <i>n</i> = 133	SD	df	F-value
---------------------------	------------------------------------	-----------------------	----------------------	----	----	---------

Note: NSSI = Non-suicidal self-injury, SA = Suicide Attempt.

^aNo self-injury significantly different from both NSSI and SA

^bNSSI group significantly different from SA

^cNo self-injury significantly different from SA, but not different from NSSI.

** $p < .01$

*** $p < .001$

Age	16.49	16.68	16.36	1.90	2,869	0.66
Parental monitoring	4.86 ^a	4.40	4.23	0.94	2,738	35.68***
Attachment to parents: Care	3.14 ^a	2.93	2.73	0.55	2,756	41.00***
Attachment to parents: Overprotection	2.00	2.16	2.28 ^c	0.57	2,768	18.14***
Self-concept						
Unstable	4.78 ^a	2.71	2.92	0.70	2,772	28.97***
Romantic appeal	2.70	2.74	2.73	0.58	2,743	0.42
Close friends	3.29	3.23	3.31	0.59	2,767	0.52
Social acceptance	3.17	3.12	3.02 ^c	0.51	2,773	6.04**
School competence	2.95 ^a	2.67	2.61	0.54	2,770	33.18***
Athletic competence	2.54	2.37	2.31 ^c	0.68	2,770	9.34***
Physical appearance	2.68 ^a	2.40	2.20	0.69	2,776	35.88***
Global self-worth	2.99 ^a	2.72 ^b	2.48	0.55	2,772	62.28***
Substance use score	-0.04 ^a	0.57	0.53	0.69	2,850	69.10***
Conduct problem score	0.22	0.41	0.78 ^c	0.96	2,814	23.34***
Depressive mood	1.71 ^a	2.20	2.44	0.58	2,756	137.07
Suicidal ideation	1.10 ^a	1.54 ^b	2.13	0.52	2,849	333.06***
Eating Attitudes Test score	1.59 ^a	1.81	1.84	0.38	2,880	38.73***
Bulimic Investigatory Test—Edinburgh total score	1.63 ^a	1.77	1.87	0.30	2,861	49.54***
Bulimic Investigatory Test—Edinburgh severity score	1.15 ^a	1.24	1.29	0.17	2,894	57.84***
UCLA Loneliness Scale score	1.80 ^a	2.06	2.18	0.56	2,770	36.31***
Friends' conduct problems	1.06	2.31	2.21	1.60	2,830	51.66***
Number of social support persons score	12.45	11.49	10.91 ^c	5.06	2,880	6.99***
Satisfaction with social support score	3.49	3.37	3.37 ^c	0.45	2,680	9.19***

TABLE 2. Mean Level of Risk and Protective Factors at T1 among Subjects with No Self-Injury, NSSI, or SA during Follow-Up

Risk or protective factor	No self-injury $n = 2,765$	NSSI $n = 65$	SA $n = 94$	df	F
---------------------------	-------------------------------	------------------	----------------	----	---

Note: Scale ranges in parenthesis. NSSI = Non-suicidal self-injury, SA = Suicide attempt.

^aNo self-injury significantly different from both NSSI and SA groups

^bNSSI group significantly different from SA

^cNo self-injury significantly different from SA, but not different from NSSI.

** $p < .01$

*** $p < .001$.

Age	16.51 ^a	16.00	15.96	2,867	5.91 ^{**}
Parental monitoring	4.84	4.63	4.40 ^c	2,468	11.01 ^{***}
Attachment to parents: Care	3.13	3.00	2.74 ^{b,c}	2,479	24.31 ^{***}
Attachment to parents: Overprotection	2.00	2.05	2.34 ^{b,c}	2,489	15.26 ^{***}
Self-concept					
Unstable	2.48	2.73	2.99 ^{b,c}	2,457	26.72 ^{***}
Romantic appeal	2.71 ^a	2.61	2.49	2,453	7.18 ^{***}
Close friends	3.29	3.23	3.21	2,479	1.15
Social acceptance	3.17	3.07	2.93 ^c	2,494	11.55 ^{***}
School competence	2.94 ^a	2.69	2.65	2,483	19.04 ^{***}
Athletic competence	2.54 ^a	2.32	2.24	2,492	11.55 ^{***}
Physical appearance	2.67 ^a	2.42	2.18	2,477	26.92 ^{***}
Global self-worth	2.98 ^a	2.67	2.46	2,482	48.64 ^{***}
Body areas satisfaction	3.48 ^a	3.23	3.03	2,511	26.21 ^{***}
Perceived obesity	2.90	3.00	3.17 ^c	2,862	8.24 ^{***}
BMI	20.96	20.92	20.63	2,837	0.55
Perceived pubertal timing	3.79	3.69	3.63	2,868	1.20
Substance use score	-0.02 ^a	0.31	0.18	2,850	12.61 ^{**}
Conduct problem score	0.23	0.55	0.52	2,812	7.45 ^{***}
Depressive mood	1.73 ^a	2.15	2.27	2,462	56.62 ^{***}
Suicidal ideation	1.12 ^a	1.55	1.93 ^b	2,759	136.46 ^{***}
Eating Attitudes Test score	1.59 ^a	1.74	1.87	2,878	27.75 ^{***}
Bulimic Investigatory Test—Edinburgh total score	1.63 ^a	1.77	1.88	2,859	37.12 ^{***}
Bulimic Investigatory Test—Edinburgh severity score	1.15 ^a	1.21	1.30	2,892	36.58 ^{***}
UCLA Loneliness Scale score	1.81 ^a	2.01	2.24 ^b	2,376	30.62 ^{***}
Number of social support persons score	12.43 ^a	10.80	11.16	2,886	6.03 ^{**}
Satisfaction with social support score	3.49 ^a	3.24	3.40	2,678	11.11 ^{***}

TABLE 3. Risk and Protective Factors at T1 Predicting NSSI and SA during Follow-Up. Multivariate Nominal Regression

Risk and protectors at T1	Type of self-injurious behavior during follow-up				&b.Delta; of -2 log-likelihood if removed
	NSSI (<i>n</i> = 56)		SA (<i>n</i> = 72)		
	OR	95%CI	OR	95%CI	
Suicidality (Contrast = No self-injury, <i>n</i> = 2,010)					55.06***
NSSI	4.62 ^a	1.98-10.86	1.16	0.36-3.87	
SA	4.30	1.95-9.50	7.49	4.13-13.59	
Age (years)	0.86	0.74-1.00	0.94	0.83-1.07	4.63
Gender (girl)	1.99	1.04-3.79	2.25	1.25-4.06	11.49**
Parental care (1-6)	1.27 ^a	0.76-2.12	0.57	0.38-0.86	9.06**
Global Self-Worth (1-4)	0.52	0.32-0.86	0.45	0.29-0.71	16.64***
Non-heterosexual sexual interest	4.06	1.95-8.47	6.81	3.70-12.55	38.77***
Early sexual debut	1.97	1.13-3.40	1.44	0.86-2.39	6.48*
Conduct problems	2.87	0.77-10.74	4.52	1.64-12.47	8.37*
Suicidal ideation (1-4)	1.25	0.85-1.82	2.00 ^a	1.51-2.67	21.36***
Satisfaction with social support (1-4)	0.53	0.30-0.94	1.31 ^a	0.77-2.20	6.34*

Note: No self-injury is contrast. Scale ranges in parenthesis. NSSI = Non-suicidal self-injury, SA = Suicide Attempt.

^aatom or higher than the or for the other self-injury category.

p < .05

.

**p* < .05

,

***p* < .01

,

****p* < .001.