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Lifetime and 12-Month Nonsuicidal Self-Injury and Academic Performance in College Freshmen

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We examined whether nonsuicidal self-injury (NSSI) is associated with academic performance in college freshmen, using census-based web surveys (N = 7,527; response = 65.4%). NSSI was assessed with items from the Self-Injurious Thoughts and Behaviors Interview and subsequently linked with the administratively recorded academic year percentage (AYP). Freshmen with lifetime and 12-month NSSI showed a reduction in AYP of 3.4% and 5.9%, respectively. The college environment was found to moderate the effect of 12-month NSSI, with more strongly reduced AYPs in departments with higher-than-average mean departmental AYPs. The findings suggest that overall stress and test anxiety are underlying processes between NSSI membership and academic performance.

Nonsuicidal self-injury (NSSI), which refers to the intentional destruction of one's body surface without suicidal intent (Nock, 2009), is a puzzling behavior that poses considerable health challenges on college campuses worldwide. Approximately 15% to 20% of college students report lifetime NSSI, with 3% to 7% reporting 12-month

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NSSI (Swannell, Martin, Page, Hasking, & St John, 2014; Taliaferro & Muehlenkamp, 2015; Whitlock et al., 2011). The significance of NSSI was recently emphasized by the *DSM–5* with the inclusion of the NSSI disorder as a "condition requiring further study" (American Psychiatric Association [APA], 2013). While progress has been made in research on risk factors for NSSI (Fox et al., 2015; Nock, 2009, 2014), current knowledge on functioning of self-injurers in important areas of life is unsatisfactory (Muehlenkamp, 2015).

For an increasing number of emerging adults (OECD, 2014), academic performance is an area of life showing positive relationships with subsequent economic self-efficacy (i.e., higher likelihood to be employed and to earn more), better (mental) health conditions, and higher societal engagement (Dalgard, Mykletun, Rognerud, Johansen, & Zahl, 2007; Hooven, Snedker, & Thompson, 2012; Jablonska et al., 2012; OECD, 2014). Determining conditions of poor academic performance are thus not only important on an individual level, but also relevant to society as a whole (Freudenberg & Ruglis, 2007; OECD, 2014). Importantly, the current proposal of the NSSI disorder in *DSM–5* states that NSSI has the potential to cause academic interference (APA, 2013). Scientific knowledge regarding the association between NSSI and academic performance is, however, far from settled. First, no studies have examined the association between NSSI and academic performance in college students. Second, studies among adolescent samples that included academic outcome measures yielded mixed results. Zetterqvist, Lundh, Dahlström, and Svedin (2013) found that 66% of adolescents with the NSSI disorder indicated academic difficulties due to NSSI, whereas others suggested similar or even higher academic performance levels among NSSI adolescents (Baetens, Claes, Muehlenkamp, Grietens, & Onghena, 2012; Mars et al., 2014; Taliaferro, Muehlenkamp, Borowsky, McMorris, & Kugler, 2012). Third, prior studies failed to recognize that individual students are clustered within the academic environment, which may lead to overgeneralized conclusions (Kenny & Judd, 1986). For example, there is an indication that the association between suicidal behavior and academic performance differs according to the level of departmental achievement (Mortier et al., 2015). Therefore, it may also be necessary to anticipate the possibility that the academic environment moderates the association between NSSI membership and academic performance.

It is probably unlikely that the act of NSSI directly drives academic interference. Several indirect mechanisms may instead explain academic interference in college students. First, NSSI can be seen as a signal of (internalizing) distress (Baetens et al., 2012; Glenn & Klonsky, 2011; Taliaferro & Muehlenkamp, 2015), and so it may be that NSSI negatively impacts academic performance through specific distress-related symptoms (e.g., sleeplessness; Chandavarkar, Azzam, & Mathews, 2007; Deroma, Leach, & Leverett, 2009; Hershner & Chervin, 2014). Second, the transition from high school to college forms a potentially stressful period in which people on the verge of their young adulthood typically move away from home, form new relationships, and are forced to cope with academic demands (Arnett, 2000; Dyson & Renk, 2006; Robotham, 2008). Prior research has shown that self-injuring youth are more prone to experiencing stress (Kiekens et al., 2015), which may negatively impact academic performance in college students (Richardson, Abraham, & Bond, 2012). Third, although self-injurers are often described as perfectionistic, scholars have found that they score high on maladaptive perfectionism (Baetens et al., 2013; Claes, Soenens, Vansteenkiste, & Vandereycken, 2012; Hoff & Muehlenkamp, 2009). This means that they are concerned about being negatively evaluated, are highly critical of themselves, and see mistakes as unacceptable, all of which have been found to be related to a poorer profile of academic functioning (Hanchon, 2010). However, a related proxi-

mal construct (Eum & Rice, 2011), which more strongly impacts academic performance, is test anxiety (Richardson et al., 2012). *Test anxiety* refers to the short-term distress and worry of students who are afraid of failure (Putwain, Woods, & Symes, 2010) and is believed to be triggered in an evaluative situation by negative self-knowledge (see Zeidner & Mattiws, 2005). Prior studies have demonstrated that self-injurers report more fragile academic self-concepts and an increased sense of ineffectiveness (Claes, Houben, Vandereycken, Bijttebier, & Muehlenkamp, 2010; Ross, Heath, & Toste, 2009). However, until now, research has failed to examine whether internalizing distress, overall stress, and test anxiety are potential underlying processes in the association between NSSI membership and academic performance.

We address the current shortcomings in the existing research using data from the Leuven College Surveys, which are part of the World Health Organization World Mental Health Surveys International College Student Project (WMH-ICS, n.d.). The main purpose of the present study was to examine (1) the association between NSSI membership and NSSI frequency (as a measure of severity; You, Leung, Fu, & Lai, 2011) and academic performance; (2) whether the association between NSSI membership and academic performance is dependent on the academic environment; and (3) whether internalizing distress, overall stress, and test anxiety are underlying processes in the association between NSSI membership and academic performance.

METHODS

Procedures and Sample Description

As a part of the WMH-ICS, data were drawn from the Leuven College Surveys, which consist of ongoing web-based surveys of KU Leuven college students. KU Leuven is Belgium's largest university with an enrollment of over 40,000 students. In the academic years 2012–2013 and 2013–2014, a total of 7,527 Dutch-speaking freshmen were eligible for inclusion at the beginning of the academic year (i.e., census sampling). Recruitment consisted of three consecutive phases with different refusal conversion strategies to increase the final response rate. In the first phase, students were randomly invited throughout the academic year for a routine psychomedical checkup organized by the university student health center. All incoming freshmen were sent a standard invitation letter. In the second phase, nonrespondents were personally contacted using customized e-mails containing secured electronic links to the survey. The third phase was identical to the second phase, but additionally included an incentive (i.e., a raffle for 20 euro store credit coupons). Each phase used reminders (1-week interval), setting the maximum amount of contacts at eight. The sample consisted of 4,921 freshmen, which means that 65.4% of all KU Leuven freshmen that were enrolled at the beginning of the academic year participated [55.5% females; $M_{age}(SD) = 18.68\ (1.10)$]. Parental consent was obtained from students under the age of 18, and the study's protocol was approved by the university hospital and by the Belgian commission for the protection of privacy.

Measures

Sociodemographic variables/covariates included gender (female vs. male), age (i.e., ≤18 vs. >18 years), nationality (i.e., Belgian vs. non-Belgian), parental financial situation (i.e., difficult vs. nondifficult), parental educational level (i.e., high: both parents completed at least a bachelor's degree; mixed: only one parent completed a bachelor's degree; and low: neither of the parents completed a bachelor's degree), family composition (i.e., broken vs. intact), secondary school type (i.e., general vs. nongeneral track), and higher level field of study (i.e., 7 departments from the biomedical sciences,

10 departments from science and technology, and 21 departments from the human sciences).

NSSI was assessed through items from the well-validated Self-Injurious Thoughts and Behaviors Interview (SITBI; Nock, Holmberg, Photos, & Michel, 2007), a structured interview to assess self-injurious thoughts and behaviors. Students were asked: "Did you ever do something to hurt yourself on purpose, without wanting to die (e.g., cutting yourself, hitting yourself, or burning yourself)?" When replied affirmatively, prevalence in the 12 months prior to college entry was assessed as well. Based on these questions, three membership statuses were created: students who reported they never engaged in NSSI, students with lifetime NSSI but not in previous 12 months (i.e., at least one act of NSSI in the past, but not in the first year of college), and students with 12-month NSSI (i.e., at least one act in the 12 months prior to college). Freshmen with past NSSI were also asked to indicate in prespecified categories the number of times that they had engaged in NSSI. Self-injurers were characterized as experimental (1–2 times), low (3–10 times), high (11–30 times), or very high (+30 times) NSSI engagement. The SITBI construct validity is known to be good for NSSI ($\kappa = 0.74$), with excellent interrater reliability and test–retest reliability after 6-month follow-up ($\kappa = 1.0$; Nock et al., 2007).

Academic performance was assessed using objectively recorded data obtained from the administrative office of the KU Leuven. Specifically, each student's academic year percentage (AYP; range: 0.0%–100%) was obtained after (potential) retakes. The AYP is the weighted average from grades of all classes during the first year, which is a relevant academic parameter showing a strong positive association with the number of credits students obtained ($r = .93$). Students fail for a course—and lose the associated credits—when the obtained grade is less than 50%. Students who earn their bachelor's degree with 68% or more are awarded the degree with distinction (honors).

Overall stress was assessed by means of eight items from the WMH Composite International Diagnostic Interview (Kessler & Üstün, 2004), calculated as the sum of stress students experienced in eight areas of life (e.g., "How much stress do you currently have in love life, financial situation, relationship with family and peers, etc."), rated on a 5-point rating scale (ranging from *very severe* to *none*). The internal consistency of the stress scale was good ($\alpha = .83$).

Test anxiety or proneness to test situations was assessed with the five-item Test Anxiety Inventory-short version (TAI-5), which showed to be a reliable ($r = .93$ between short and long form) and valid alternative of the full questionnaire (Taylor & Deane, 2002). Students were asked to rate on a 5-point Likert scale (ranging from *very often* to *never*) to what extent they worry and become emotional during test situations (e.g., "I seem to defeat myself while working on important tests"). The internal consistency of the TAI-5 was excellent ($\alpha = .90$).

Internalizing distress included depressive feelings, sleep problems, anxiety, posttraumatic stress, and suicidal thoughts and behaviors and was assessed by means of the five-item Gain-Short Screener (GSS). The GSS highly correlates with the original corresponding subscales of the *DSM–IV-TR*-based GAIN structured interview ($r = .89$; Dennis, Chan, & Funk, 2006). For the purpose of the current study, we focused on past-year symptoms, which had an acceptable internal consistency ($\alpha = .71$).

Departmental enrollment status was assessed for each student. The KU Leuven is divided into 40 departments based on the academic content being offered (e.g., psychology). Departments are microunits within the larger campus environment, each with its own shared structural, interpersonal, and social elements. Two departments were excluded due to low caseloads ($n \leq 1$). The median departmental enroll-

ment size was 64.5 students (interquartile range = 36–175).

Statistical Analyses

First, nonresponse propensity weighting was performed to represent the full target population on the sociodemographic variables (Bethlehem, Cobben, & Schouten, 2011). Second, because response rates have been found to be potentially poor indicators of data quality, we also calculated representativeness indicators for the sociodemographic variables (R-indicators; Schouten, Cobben, & Bethlehem, 2009). Third, multiple imputation methods—using fully conditional specification methods—were applied on the respondent data to account for item missingness in the individual-level analyses (Van Buuren, 2007; Van Buuren, Brand, Groothuis-Oudshoorn, & Rubin, 2006).

Using SPSS 22.0 (IBM Corp., 2013), a multinomial multivariate logistic regression analysis with sociodemographic variables as predictors and membership status of the NSSI category as an outcome variable was carried out to detect potential covariates in the association between NSSI membership and academic performance. Next, using MLwiN 2.24 (Rasbash, Steele, Browne, & Goldstein, 2012), individual freshmen (level 1) were nested within KU Leuven college departments (level 2) to examine whether NSSI membership is associated with AYP and to anticipate the possibility that the individual-level association of NSSI with subsequent AYP may vary as a function of the mean department-level performance standard (operationalized as mean department-level AYP). Significance testing from zero of fixed effects and (co)variances was performed using the univariate Wald test. The proportion of the total variance accounted for by each specific group (i.e., variance partitioning coefficient [VPC]; Goldstein, Browne, & Rasbash, 2002) was also calculated to evaluate the importance of interdepartmental variation in mean AYP across the individual-level membership status. Next, using SPSS 22.0 (IBM Corp., 2013), a single-level regression analysis was run to examine the association between NSSI frequency and academic performance within the group of freshmen with lifetime and 12-month NSSI. Finally, using hierarchical regression analyses (cf. Weierich & Nock, 2008), overall stress, test anxiety, and internalizing distress were examined as potential processes underlying the association between NSSI and AYP. Overall stress and test anxiety were z-standardized, and the analyses were adjusted for the data-driven selected covariates. To evaluate the unique effect of each mediator on AYP, b paths (associations between mediators and AYP) were also adjusted for the other mediators.

RESULTS

Preliminary Analyses

R-indicators increased from 0.803 after inclusion in phase 1 to 0.815 after inclusion in phase 3, suggesting a high representativeness of our sample compared with the full target population. Of the total sample, 91.8% did not report NSSI, 5.5% reported lifetime without 12-month NSSI, and 2.8% reported 12-month NSSI. The average AYP was 49.8%. As can be seen in Table 1, female gender and belonging to a department from the human sciences predicted both lifetime and 12-month NSSI membership, whereas older age and having followed a nongeneral track in high school were only predictive for lifetime NSSI. Therefore, these data-driven covariates were included in subsequent analyses wherein NSSI membership was involved as a predictor.

Individual and Departmental Association between NSSI Membership and AYP

After controlling for the data-driven confounders, freshmen with lifetime and 12-month NSSI had mean AYPs, which were 3.35% and 5.85% lower, respectively,

TABLE 1
Multinomial Logistic Regression Analysis for Variables Predicting NSSI Membership

	β	*SE*	OR [95% CI]
Lifetime without 12-month NSSI[a]			
Gender (female)	.74**	.16	2.09 [1.53–2.86]
+18 years	.32*	.16	1.37 [1.01–1.87]
Belgian nationality	−.05	.26	0.95 [0.57–1.58]
Nongeneral track in high school	.49*	.23	1.63 [1.03–2.58]
Difficult parental financial situation	.30	.19	1.35 [0.92–1.97]
Broken familial composition	.17	.17	1.18 [0.84–1.66]
Parental educational level[b]			
Mixed	−.06	.19	0.94 [0.65–1.35]
Both lower education	.15	.20	1.16 [0.79–1.70]
Current higher level field of study[c]			
Science & technology	−.19	.25	0.83 [0.51–1.35]
Humanities	.63**	.18	1.87 [1.31–2.67]
12-month NSSI[a]			
Gender (female)	.54*	.22	1.72 [1.13–2.63]
+18 years	.06	.22	1.06 [0.69–1.65]
Belgian nationality	−.03	.37	0.97 [0.47–2.00]
Nongeneral track in high school	.59	.33	1.80 [0.93–3.45]
Difficult parental financial situation	.31	.26	1.37 [0.82–2.27]
Broken familial composition	.16	.25	1.17 [0.72–1.90]
Parental educational level[b]			
Mixed	.01	.26	1.01 [0.61–1.68]
Both lower education	−.10	.29	0.91 [0.51–1.61]
Current higher level field of study[c]			
Science & technology	.02	.33	1.02 [0.53–1.97]
Humanities	.59*	.25	1.80 [1.10–2.94]

SE = standard error; OR = odds ratio; 95% CI = 95% confidence interval of OR. Estimates are pooled based on 100 imputed data sets.
[a]Reference group are students with no past NSSI.
[b]Reference group are parents with both higher education.
[c]Reference group are students from the biomedical sciences
*$p < .05$, **$p < .001$.

than students who never engaged in NSSI (Table 2). We found a significant covariance between departmental AYP and departmental decrease in AYP associated with 12-month NSSI (Wald $Z = 2.28$, $p = .022$, Table 2).

Figure 1 demonstrates the negative association between the differential departmental AYP and the differential departmental reduction in 12-month NSSI ($r = -.623$, $p < .001$). Freshmen with 12-month NSSI who belonged to departments with higher-than-average mean departmental AYPs had higher associated reductions in their AYP (mean reduction −9.34%; min = −.09%, max = −19.66%), whereas the AYP for those belonging to departments with lower-than-average mean departmental AYPs was less strongly or even not impacted (mean reduction −2.80%; min = 3.10%, max = −9.82%). The VPC indicated that for freshmen without lifetime NSSI and for freshmen with lifetime without 12-month NSSI, respectively, 5.3% and 7.2% of the variance in AYP was attributable to the departmental level, compared with 14% for freshmen with 12-month NSSI.

TABLE 2
Impact of NSSI Membership on Academic Year Percentage

	AYP		
Fixed effects[a]	β	*SE*	95% CI
Intercept	51.29***	1.77	47.82; 54.76
NSSI membership			
Lifetime without 12-month NSSI	−3.35*	1.31	−5.91; −0.78
12-month NSSI	−5.85**	2.20	−10.16; −1.54
Data-driven covariates			
Gender (female)	2.54**	.60	1.36; 3.72
+18 years	−7.94***	.63	−9.17; −6.70
Nongeneral track in high school	−18.10***	1.10	−20.26; −15.94
Current higher level field of study			
Science & technology	3.08	2.12	1.08; 7.24
Humanities	.15	1.90	−3.57; 3.87
Outlier[b]			
Medical department	20.66***	5.19	10.49; 30.83

Random effects[c]	Var/covar	*SE*	95% CI
Mean departmental AYP (σ^2_{u0})[d]	15.65***	4.94	5.97; 25.33
Mean departmental reduction in lifetime without 12-month NSSI (σ^2_{u1})[e]	–	–	–
Mean departmental reduction in 12-month NSSI (σ^2_{u2})[d]	71.38	42.02	−10.98; 153.74
Mean departmental AYP × reduction in lifetime without 12-month NSSI (σ_{u0u1})	6.23	5.01	−3.59; 16.05
Mean departmental AYP × reduction in 12-month NSSI (σ_{u0u2})	−20.83*	9.12	−38.71; -2.95
Individual AYP (σ^2_{e0})[d]	281.33***	9.83	262.06; 300.60
Individual AYP × reduction in lifetime without 12-month NSSI (σ_{e01})	39.54*	16.27	7.65; 71.43
Individual AYP × reduction in 12-month NSSI (σ_{e02})	−1.54	15.88	−32.66; 29.58

SE = standard error; 95% CI = 95% confidence interval of β; var = variance; covar = covariance.
[a]Estimated with the iterative generalized least-squares method with $\sigma^2_{u1,\ u0u1,\ \text{and}\ \sigma_{e02}}$ set at zero to reach convergence (Jones & Subramanian, 2012).
[b]The department of medicine was treated as fixed effect because medical students passed an entrance examination and diagnostics showed this department to have high residual values.
[c]Estimated with the restricted iterative generalized least-squares method (Jones & Subramanian, 2012).
[d]One-tailed test to reflect the correct sampling variability in the estimation of variance components.
[e]Parameter set at zero due to negative variance.
*$p < .05$, **$p < .01$, ***$p < .001$.

Individual Association between NSSI Frequency and AYP

An inter-NSSI group comparison revealed no significant differences between students with lifetime or 12-month NSSI who injured themselves only once or twice (experimental engagement) compared with those who injured themselves 3–10 times (low engagement), 11–30 times (high engagement), or more than 30 times (very high engagement; Table 3).

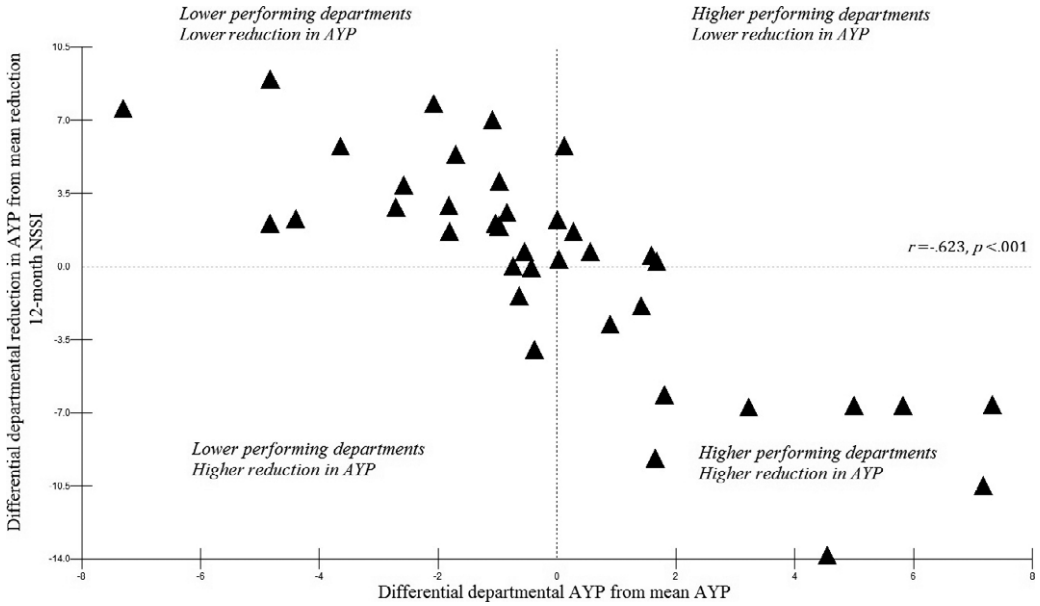

Figure 1. Correlation plot between differential departmental academic year percentage and differential departmental reduction in academic year percentage from mean reduction in 12-month nonsuicidal self-injury membership. NSSI = nonsuicidal self-injury, AYP = academic year percentage.

TABLE 3
Impact of NSSI Frequency on Academic Year Percentage

	%	β	*SE*	*p*
Inter-NSSI group comparison				
Lifetime without 12-month NSSI[a]				
Experimental NSSI engagement (1–2 times)	36.9	–	–	–
Low engagement (3–10 times)	40.4	4.52	3.00	.132
High engagement (11–30 times)	15.6	5.50	3.98	.167
Very high engagement (+30 times)	7.1	2.53	5.30	.633
12-month NSSI[a]				
Experimental NSSI engagement (1–2 times)	14.6	–	–	–
Low engagement (3–10 times)	39.6	4.60	5.25	.381
High engagement (11–30 times)	26.0	−1.33	5.65	.814
Very high engagement (+30 times)	19.8	−2.24	6.11	.714

Adjusted for gender and age. SE = standard error. Estimates are pooled based on 100 imputed data sets.

[a]Reference group are students with experimental NSSI engagement.

Overall Stress, Test Anxiety, and Internalizing Distress as Underlying Processes between NSSI Membership and AYP

The negative associations between NSSI membership and academic performance were fully mediated by overall stress and test anxiety (Figure 2). Freshmen with lifetime or 12-month NSSI showed in comparison with peers without past NSSI heightened levels of overall stress and test anxiety, which in turn were both negatively and independently associated with academic

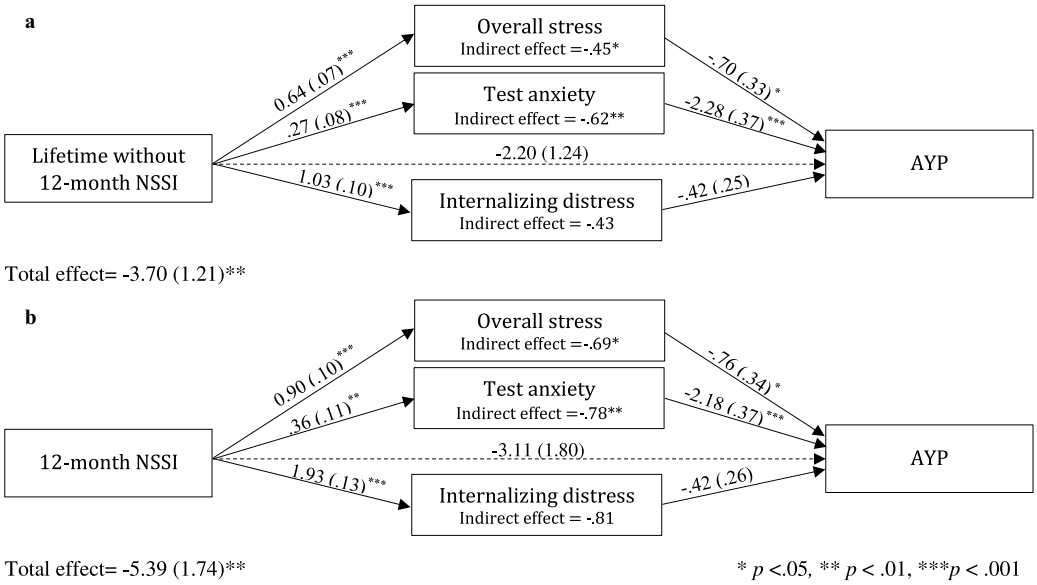

Figure 2. Parallel mediation between nonsuicidal self-injury membership and academic performance. Figures between parentheses represent standard errors, and strength and direction of indirect effects are denoted. All pathways are adjusted for age, gender, nongeneral track in high school, current higher level field of study, and *b* pathways are also adjusted for the other mediators. Estimates are pooled based on 100 imputed data sets. NSSI = nonsuicidal self-injury, AYP = academic year percentage.

performance (Figure 2). In addition, freshmen with lifetime or 12-month NSSI also experienced more internalizing distress than peers without NSSI (Figure 2), which was in turn significantly negatively related to academic performance when the *b* path was not controlled for overall stress and test anxiety (indirect effect = −2.24, Wald $Z = 5.19$, $p < .001$). When controlling the *b* path for the other mediators, internalizing distress was no longer a significant mediator between NSSI membership and academic performance (Figure 2).

DISCUSSION

This is the first study to examine the association between NSSI and academic performance in college students, expanding previous knowledge in several ways. First, incoming freshmen with lifetime or 12-month NSSI were found to have lower academic performance scores than their peers without past NSSI. Second, NSSI frequency as a measure of NSSI severity showed no association with academic performance. Third, the college environment moderated the association between NSSI and academic performance for 12-month self-injuring freshmen. Fourth, overall stress and test anxiety were found to be potential underlying processes in the association between NSSI membership and academic performance.

Approximately 8% of freshmen reported lifetime NSSI, which was a lower estimate than reported in previous research (Swannell et al., 2014; Whitlock et al., 2011). However, in line with a recent American study, approximately 3% engaged in NSSI at least once within the 12 months prior to matriculation (Taliaferro & Muehlenkamp, 2015). Although students with NSSI in adolescence have been found to have similar high school performance scores (Baetens et al., 2012; Mars et al., 2014; Taliaferro et al., 2012), our findings suggest that NSSI is associated with lower academic performance in college. More specifically, the 3.4%–5.9% lower AYPs in freshmen with lifetime or 12-month NSSI correspond

roughly to a loss in grade point average of 0.2 and 0.3, respectively. Even when freshmen are in remission of NSSI, their academic performance was found to be lower than that of peers without past NSSI.

NSSI frequency—as a measure of NSSI severity (You et al., 2011)—did not render academic impact above and beyond NSSI membership. This may either indicate that NSSI severity is not associated with academic performance within freshmen with past NSSI or that lifetime NSSI frequency is suboptimal to measure NSSI severity. To rule out one of both explanations, future research should include 12-month frequency and the number of NSSI methods (i.e., NSSI versatility). The latter has been found to be related to psychopathology (Somer et al., 2015; Whitlock, Muehlenkamp, & Eckenrode, 2008) and to severe suicidality above and beyond NSSI frequency (Nock, Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2006; Turner, Layden, Butler, & Chapman, 2013). Taken together, our current findings suggest that even experimental engagement in NSSI is significantly related to lower academic performance, which resonates with prior work from Whitlock, Eckenrode, and Silverman (2006) who found that college students with a single episode of NSSI also report higher levels of past-month psychiatric distress.

Another novel finding in the present study is that the association between 12-month NSSI and subsequent academic interference varied with mean departmental AYP and was stronger in high-performing college departments. Although it is well-known that a reduced self-image due to a lower rank position may adversely affect academic performance through specific influences, such as beliefs about one's own ability (Azmat & Iriberri, 2010; Murphy & Weinhardt, 2013), it is less clear why we found such a contextual effect only for 12-month NSSI. It may be that this effect becomes apparent by unique features young adults with more recent NSSI share. Interestingly, Mortier et al. (2015) showed that for freshmen with a lifetime suicide attempt, the impact on academic performance was strongest in low-performing departments, which suggests that contextual effects may also be different between behaviors with and without suicidal intent.

The current study revealed that overall stress and test anxiety were potential underlying processes between NSSI membership and academic performance. The former is in line with prior studies which demonstrated that self-injuring youth is more prone to stress (Kiekens et al., 2015) and that overall stress—in turn—impacts academic performance in college students (Richardson et al., 2012). Our findings add to the literature that freshmen with past NSSI in comparison with peers without past NSSI score high on test anxiety, a well-known antecedent for lower academic functioning in college students (Richardson et al., 2012). Although freshmen with past NSSI showed also elevated levels of internalizing distress (Glenn & Klonsky, 2011), this was not found to be a unique underlying process between NSSI and academic performance.

Limitations

Our findings should be interpreted in the context of several limitations. First, the relatively low number of cases precluded multilevel models that were fully adjusted for sociodemographic characteristics. However, our data-driven approach assures that the most important confounders have been taken into account. Second, because the number of departments was limited, level 2 variances may be underestimated (Hox, 2010). Third, no direct information was available on precollege academic performance. However, it is important to note that the proxies secondary school type (Hillmert & Jacob, 2003) and age (captures indirectly fall behinds) have been taken into account. Fourth, because NSSI was assessed at the same time as the potential mediators, we were unable to fulfill the temporal precedence criterion of causality. It is therefore up to future longitudinal research to replicate or refute whether overall stress

and test anxiety are underlying processes in the association between NSSI membership and academic performance. Fifth, inter-NSSI group comparisons and the identification of underlying psychological mechanisms between NSSI and academic performance may also warrant more contextually valid techniques in future research. Finally, given that our findings are based on data from one college campus, replication studies are needed before findings can be generalized to college campuses or college students worldwide.

Clinical Implications

In the absence of additional research, our data suggest that interventions should focus on stress and test anxiety reduction strategies to increase the adjustment to college life and prevent academic interference for freshmen with past NSSI. Moreover, our findings suggest that resources for 12-month self-injuring freshmen should be preferentially directed to high-performing college environments. Cognitive behavioral methods (e.g., mindfulness-based cognitive therapy) directed at NSSI behaviors giving simultaneously attention to skill acquisition of alternative coping behaviors and study skills training may be best suited to teach students how to manage overall stress (Grossman, Niemann, Schmidt, & Walach, 2004; Regehr, Glancy, & Pitts, 2013) and test anxiety (Bellinger, DeCaro, & Ralston, 2015; Neuderth, Jabs, & Schmidtke, 2009) and to reduce NSSI engagement (Turner, Austin, & Chapman, 2014).

CONCLUSION

The most important finding is that this study suggests that freshmen who have engaged in NSSI are potentially at higher risk for academic failure and possible long-term negative consequences. For college freshmen with 12-month NSSI, academic performance was most strongly impacted in high-functioning college environments. In line with our findings, efforts should be made to reduce overall stress and test anxiety in freshmen with past NSSI.

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