Nonsuicidal self-injury expectations and psychopathology over time: Linear and nonlinear multilevel modelling approaches

by

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Abstract

Nonsuicidal self-injury (NSSI), the deliberate self-infliction of tissue damage, is a serious behaviour with a host of negative consequences that has a considerable impact on the health system. People engage in NSSI for a variety of reasons and often expect desirable outcomes from NSSI (e.g., relieving emotions, communicating to or influencing others). Understanding the link between these expectations and various symptoms of psychopathology will help to refine theoretical models of NSSI and inform treatment. Female participants ($N = 197$) with a recent history of NSSI completed online measures of self-injury, psychopathology and psychological distress (including suicidality and depressive symptoms), and social support at 3-month time points for 24 months. Multilevel regression analyses of these time series data indicated that suicidality and depressive symptoms were positively associated with greater endorsement of intrapersonal NSSI expectations concurrently, and that depression positively predicted intrapersonal NSSI expectations at the following 3-month time point. Depressive symptoms were associated with interpersonal NSSI expectations concurrently but not prospectively. Overall, these findings further validate models of NSSI that distinguish between intrapersonal and interpersonal expectations within a longitudinal framework and suggests applications relevant to person-centred case conceptualizations of NSSI and NSSI treatment.

Keywords: nonsuicidal self-injury; psychopathology; multi-level modeling
To my loves, Miranda, Keira, and Evie. Thank you for your patience.

(Girls, if you’re reading this, I am touched. Also, here are some more enjoyable alternatives:

The Hobbit by J.R.R. Tolkien

The Princess Bride by William Goldman

To Kill a Mockingbird by Harper Lee

The Name of the Wind by Patrick Rothfuss

Reading is awesome. Love, Dad)
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I want to call out and celebrate the members of the Personality and Emotion Research Lab. Their time and energy literally (figuratively) keep the lights on. Thank you.

I want to shout and wave at my family and friends. If they can read this, that something amazing happened: they encouraged me, supported me, and waited for me. This is the hidden emotional work at the centre of things. This is true love and sacrifice. I am undeniably fortunate. Thank you.
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1. INTRODUCTION

Overview

Individuals who engage in nonsuicidal self-injury (NSSI)—the deliberate, self-directed, non-socially sanctioned destruction of bodily tissue without suicidal intent (Chapman et al., 2006; Gratz, 2003; Klonsky et al., 2003; Nock et al., 2006)—do so despite negative physical, emotional, and social consequences (e.g., Asarnow et al., 2011; Dulit et al., 1994; Esposito et al., 2003; Favazza, 1998; Guan et al., 2012; Leibenluft et al., 1987). When asked, individuals often endorse a variety of expectations about the effects of NSSI (e.g., to relieve emotions, communicate to others; Edmonson et al., 2016; Klonsky, 2007; Taylor et al., 2018). Broadly, such expectations can be conceptualized as intrapersonal (e.g., to change emotional states or physiological sensations) or interpersonal (e.g., to communicate to others or influence the interpersonal environment). The types of expectations people have about NSSI may reflect the presence of psychiatric symptoms broadly or clinical problem areas more specifically (e.g., people who expect NSSI to relieve emotions may have corresponding difficulties with intense emotions or emotion regulation). Accordingly, extant research has suggested that NSSI expectations are related to the presence and severity of various clinical symptoms, including depressive and anxious symptoms, as well as suicidality, interpersonal sensitivity, and social support (Bentley et al., 2015; Hilt et al., 2008; Klonsky & Glenn, 2009; Martin et al., 2013; Nock & Prinstein, 2005; Roley-Roberts et al., 2017; Turner et al., 2012). Therefore, understanding the factors associated with NSSI expectations could improve theory regarding NSSI and suggest
important avenues for treatment among people engaging in NSSI with different types of expectations.

Despite these illuminating findings, some key limitations characterize the designs of extant research, such as a reliance on cross-sectional data and a lack of examination of the nature (linear, binary, etc.) of the relationships among NSSI expectations and clinical symptoms. In addition, the research has primarily involved psychiatric inpatients with more severe NSSI behaviours or individuals recruited from non-clinical settings with less severe NSSI behaviours (e.g., student samples). As a result, individuals that engage in more severe NSSI in the community are relatively underrepresented (Turner et al., 2012). For this research, I addressed some of these limitations by analyzing data gathered from an online sample of individuals visiting online support forums and social networking spaces related to NSSI, that endorse more severe NSSI than other community groups. Participants completed self-report questionnaires every 3 months for up to 2 years and these data were analyzed using multilevel modeling to account for the nested structure of within-individual observations over time. This allowed for contemporaneous (cross-sectional) and longitudinal (lagged) associations to be assessed.

NSSI Topography, Prevalence, and Expectations

NSSI typically describes a broad spectrum of behaviours (e.g., cutting, scratching, burning or bruising bodily tissue) occurring across a range of community and clinical populations. Community samples surveyed indicate that between four and six percent of individuals overall and 14 to 36 percent of adolescents have some history of
NSSI (Laye-Gindhu & Schonert-Reichl, 2005; Muehlenkamp & Gutierrez, 2004; Ross & Heath, 2002; Zetterqvist et al., 2013; Zoroglu et al., 2003). NSSI history is substantially more common in psychiatric inpatient samples than in community samples, with prevalence estimates ranging between 12 and 80 percent among psychiatric patients. This broad range depends in part on the age of participants and the research setting, with higher rates observed among adolescents compared to adults and in inpatient compared to outpatient settings (Jacobson et al., 2008; Klonsky & Muehlenkamp, 2007; Nock & Prinstein, 2004; Washburn et al., 2012). Common negative consequences of NSSI include tissue damage ranging from superficial injury to infection, scarring, permanent functional impairment, and accidental death. In addition, NSSI is associated with negative emotional consequences (e.g., increased shame and guilt; Leibenluft et al, 1987), social consequences (e.g., social rejection; Favazza, 1998), and suicide attempts (Asarnow et al., 2011; Dulit et al., 1994; Esposito et al., 2003; Guan et al, 2012). Indeed, NSSI is among the strongest and most robust predictors of suicide attempts (Franklin et al., 2017) underscoring the critical importance of understanding factors related to NSSI risk and NSSI expectations.

Individuals engaging in NSSI commonly endorse several broad categories of reasons to engage in NSSI or expectations regarding the effects of this behaviour. Affect-regulation expectations reflect NSSI intended to alleviate negative affect, decrease physiological arousal (e.g., aversive tension), or reduce distressing thoughts (Favazza, 1992; Gratz, 2003; Haines et al., 1995). Self-punishment expectations involve efforts to actively punish oneself for some perceived wrongdoing or in response to self-directed anger, shame, guilt and self-deprecatory thoughts (Nock, 2010). Anti-
dissociation or feeling generation expectations refer to the expectation that NSSI will reduce sensations of numbness, dissociation, depersonalization and derealization and increase other sensations that make the individual feel more connected with their internal experience or the world around them (Gunderson, 1984). Anti-suicide expectations refer to the notion that NSSI interrupts, alleviates, or makes suicidal thoughts, and urges more tolerable (Suyemoto, 1998). Sensation-seeking expectations refer to the expectation of NSSI generating positive or pleasurable emotions and sensations, such as excitement, exhilaration and a physical “rush” or high (Nixon et al., 2002; Osuch et al., 1999; Shearer, 1994). Interpersonal influence has to do with the expectation that NSSI will help to communicate pain or distress to others, mobilize instrumental or emotional support, or prevent rejection and abandonment (Allen, 1995; Chowanec et al., 1991). Finally, interpersonal boundaries expectations reflect NSSI intended to assert the individual’s identity or autonomy, possibly in response to unstable or undefined sense of self (Carroll et al., 1980; Suyemoto, 1998).

Researchers advancing comprehensive theoretical models of NSSI behaviour have consistently organized NSSI expectations along higher order intrapersonal and interpersonal dimensions (e.g., Klonsky et al., 2008; Klonsky et al, 2015; Turner et al., 2012). An elaborated four-factor model (Nock et al., 2004) proposes that functions are organized along two orthogonal dimensions, according to the reinforcement properties of NSSI acts (positive or negative) and whether NSSI acts are primarily in the service of intrapersonal (referred to as “automatic”) or interpersonal (referred to as “social”) consequences. Emphasizing intrapersonal or automatic negative reinforcement, the experiential avoidance model (Chapman et al., 2006) proposes that individuals engage
in NSSI primarily to relieve or to escape distressing internal states (e.g., emotions, thoughts, sensations), and that these behaviours are maintained through negative reinforcement. Within this model, changes in the environment such as reduced demands or increased support from others can be understood as indirectly influencing internal states (e.g., reducing loneliness, frustration, worry, or hopelessness).

Examinations of the factor structure of commonly endorsed NSSI expectations have primarily supported a two-factor solution, including intrapersonal and interpersonal expectation categories and highlighting significant correlations between factors in alternative models (Klonsky et al. 2008; Klonsky et al., 2015; Turner et al., 2012).

Findings have also shed light on the range of NSSI expectations and predominant expectations. Typically, individuals with a history of NSSI endorse multiple NSSI expectations, with a mean of 5-10 specific expectations across expectation categories (Brown et al, 2002; Kleindienst et al., 2009; Lloyd-Richardson et al., 2007). In addition, intrapersonal expectations, particularly those associated with relief from negative emotional arousal, are usually more commonly and strongly endorsed compared to other expectation categories (e.g., interpersonal expectations; Brown et al., 2002; Chapman & Dixon-Gordon, 2007; Chapman et al., 2006; Haines et al., 1995; Laye-Gindhu et al., 2005; Kleindienst et al., 2008; Muehlenkamp et al., 2004; Nock et al., 2009; Rodham et al, 2004; Schnyder et al., 1999). It follows that the endorsement of NSSI expectations may relate to an individual's psychopathology and other contextual factors. Identifying these links is an important step in understanding NSSI behavior, including factors that may maintain, escalate or attenuate engagement in NSSI.
NSSI Expectations and Psychopathology

NSSI researchers have sought to understand NSSI expectations reported in the context of co-occurring psychopathology and other clinical correlates using three broad approaches. The first approach has been to identify group differences in NSSI expectations, with grouping often based on clinical differences in severity of NSSI, suicidality, or related psychopathology. Based on these studies, adult inpatients endorsing more extensive NSSI histories (i.e., more NSSI episodes) are more likely to endorse intrapersonal expectations than those with less extensive NSSI histories (Zanarini et al., 2013); adolescent students engaging in NSSI with a past-year suicide attempt endorse more intrapersonal NSSI expectations as well as more interpersonal NSSI expectations than non-attempters (Lloyd-Richardson et al., 2007), and adolescents using moderate or severe NSSI methods (i.e., methods leading to more severe tissue damage such as cutting or burning) also endorse more intrapersonal NSSI expectations as well as more interpersonal NSSI expectations than individuals engaging in minor NSSI methods (e.g., hitting, skin-picking, hair-pulling; Lloyd-Richardson et al., 2007).

A second approach has examined NSSI features, expectations and clinical correlates across empirically derived subgroups using latent class analysis. Latent class analysis determines subtypes of individuals from a relatively heterogeneous sample using an iterative data-driven approach, rather than a priori categories based on prevailing theory or clinical diagnosis. Results from three such studies of adolescents and young adults converge on four or five NSSI subgroups (Bracken-Minor et al., 2012; Klonsky & Olino, 2007; Somer et al., 2013). The first group appears to engage in NSSI
infrequently and experimentally—reporting minimal intrapersonal or interpersonal NSSI expectations; engaging in NSSI primarily by hitting, banging, or wound-picking; and endorsing lower rates of depressive features, anxiety, borderline personality features, suicide ideation, and suicide attempts than other groups. A second “mild NSSI” group endorses low levels of intrapersonal and interpersonal expectations; engages in NSSI primarily by hitting, banging, hair-pulling, biting, scratching, or wound-picking but not cutting or carving; and has an earlier age of onset and more borderline personality features than the experimental NSSI group. A third “multiple functions/anxious” group endorses multiple intrapersonal and interpersonal expectations, engages in a variety of NSSI methods and reports high levels of anxiety. A fourth “automatic functions/suicidal” group primarily endorses intrapersonal expectations, engages in NSSI primary by cutting when alone, endorses high levels of anxiety, depression, borderline features, and individuals are more likely than previous group members to have made a prior suicide attempt. A fifth “multi-method” group engages in the most variety of NSSI methods; endorses the highest rates of suicide ideation, attempts and medical interventions as well as the highest ratings of depression, anxiety, borderline personality features, and alcohol use and related problems. Studies identifying a multi-method group have reported differing patterns of endorsement of NSSI expectations, with one study reporting consistent endorsement of both intrapersonal and interpersonal NSSI expectations (Somer et al., 2013) and another reporting consistent intrapersonal expectations without interpersonal NSSI expectations (Bracken-Minor et al., 2012).

A third approach has been to examine associations between individual differences in NSSI expectations and clinical correlates, primarily through bivariate
correlation and linear regression methods. Studies examining relations between NSSI expectations and clinical correlates in adolescent psychiatric inpatients (Kumar et al., 2004; Nock & Prinstein, 2005) indicate that intrapersonal expectations are positively associated with recent suicide attempts, hopelessness, depressive symptoms, and PTSD symptoms, whereas interpersonal NSSI expectations are associated with socially prescribed perfectionism. Similar research conducted on adolescents and young adults seeking outpatient treatment for borderline personality disorder (BPD) and NSSI indicate that intrapersonal NSSI expectations are positively associated with the presence of affective instability BPD features, whereas interpersonal NSSI expectations are positively associated with chaotic relationship BPD features and stress-related paranoia/dissociation BPD features (Sadeh et al., 2014).

Bivariate and multivariate approaches have been more commonly applied with university and college student samples than with psychiatric samples. Among university and college students, intrapersonal and interpersonal NSSI expectations have been positively associated with higher levels of depression and anxiety (Bentley et al., 2015; Klonsky & Glenn, 2009); greater subjective distress and problems in social roles (Martin et al., 2013); more expressive suppression of negative emotions (Turner et al., 2012); and more BPD features (Klonsky et al., 2009). Results for suicide are somewhat equivocal, with some research indicating that both intrapersonal and interpersonal NSSI expectations are positively associated with more suicide ideation and attempts (Klonsky et al., 2009), and other research suggesting intrapersonal NSSI expectations are associated with more past suicide attempts and interpersonal NSSI expectations are associated with more current suicide ideation (Roley-Roberts et al., 2017). In addition,
one study indicated that associations between intrapersonal NSSI expectations and depression, BPD features, and suicide ideation are significantly greater than for interpersonal expectations (Klonsky et al., 2009). Considering differences between NSSI expectations, intrapersonal expectations have been positively associated with more intense negative affect, limited access to emotion regulation strategies, as well as difficulties identifying and clarifying emotions (Turner et al., 2012), whereas interpersonal expectations have been positively associated with issues in interpersonal relationships (Martin et al., 2013) as well as vindictive/non-assertive, domineering/controlling and intrusive/needy interpersonal styles (Turner et al., 2012).

Similar associations have been observed in community adolescent samples. In a community sample of adolescent girls, intrapersonal NSSI expectations were positively associated with greater depression whereas interpersonal NSSI expectations were positively associated with more peer-victimization (Hilt et al., 2008). In addition, peer communication moderated the relationship between peer victimization and interpersonal NSSI expectations such that girls that experienced peer victimization and had poor quality peer communication were more likely to self-injure for interpersonal reasons than those with better peer communication. In a sample of recently self-injuring Chinese adolescents intrapersonal and interpersonal NSSI expectations were associated with depression, anxiety, impulsivity, and suicide ideation (Leong et al., 2014). In addition, interpersonal NSSI expectations were associated with less perceived social support.

Summarizing this literature, depressive symptoms, anxiety symptoms, borderline personality features, suicide ideation and suicide attempts have been associated with endorsements of intrapersonal and interpersonal expectations in multiple studies, with
some research indicating that intrapersonal expectations are more strongly related to depression and suicide attempts than interpersonal expectations (Hilt et al., 2008; Klonsky et al., 2009; Nock et al., 2005; Kumar et al., 2004). The endorsement of interpersonal NSSI expectations has been associated with vindictive/non-assertive, domineering/controlling, and intrusive/needy interpersonal styles, as well as poor peer communication, problems in interpersonal relationships, peer victimization, and poor perceived social support (Hilt et al., 2008; Leong et al., 2014; Martin et al., 2013; Sadeh et al., 2014; Turner et al., 2012).

**Limitations of Research to Date**

As in previous research, this study aimed to identify relationships between intrapersonal NSSI expectations, interpersonal NSSI expectations and potential clinical correlates. The foregoing review of the literature has attempted to differentiate studies that have categorized the endorsement of NSSI expectations given their choice of measure or analysis (e.g., Bracken-Minor et al., 2012; Klonsky et al., 2008) from studies that treat endorsements of NSSI expectations as continuous and, based on a review of these studies’ methods sections, normally distributed. Base rates of endorsement of NSSI expectations are estimated at 66-81% for intrapersonal NSSI expectations and 33-56% for interpersonal expectations, varying according to the self-report measure used and the population of interest (Taylor et al., 2018). This indicates rates of non-endorsement that, particularly for interpersonal functions, are non-trivial and imply distributions with substantial floor effects (i.e., zero-inflated and non-normal). As a result, ordinary least-squares (OLS) regression and similar methods that presuppose a linear relationship between predictor(s) and outcome may not be appropriate.
Unfortunately, tests of model assumptions, particularly the assumption of normally distributed residuals in linear models are typically not included in published manuscripts.

Moreover, studies often have analyzed intrapersonal and interpersonal NSSI expectations equivalently despite possible differences in their underlying distributions implied by differential rates of non-endorsement. Intrapersonal expectations (e.g., emotion regulation, self-punishment, and feeling generation expectations) are the most prevalent and most strongly endorsed expectations among adolescent and adult individuals in most contexts (Taylor et al., 2018). The ubiquity of intrapersonal expectations among self-injurers appear to suggest that intrapersonal needs for emotional relief, self-punishment, or feeling generation differentiates those that engage in NSSI from those that do not. What differentiates individuals engaging in NSSI from each other is rarely the presence versus absence of intrapersonal NSSI expectations but the degree or frequency of endorsement, with consistent and frequent endorsement of these expectations associated with increased suicide ideation and attempts, and depressive symptoms (Hilt et al., 2008; Klonsky et al., 2008; Nock et al., 2005). In contrast, interpersonal NSSI expectations (e.g., interpersonal influence and interpersonal communication expectations) are reported by some self-injuring individuals but not all. These expectations appear to differentiate a subgroup of self-injurers that may have specific comorbid features such as socially prescribed perfectionism, peer victimization, and poor perceived social support (Hilt et al., 2008; Leong et al., 2014; Nock et al., 2005).

These data suggest that intrapersonal and interpersonal NSSI expectations, as captured in self-report measures, may be qualitatively different. Conceptually, an
individual’s psychopathology may be related to how many intrapersonal NSSI expectations they endorse and to what degree, as well as whether they endorse any interpersonal NSSI expectations. To my knowledge, this distinction has yet to be explored within existing published research.

A second limitation in the current literature is a reliance on cross-sectional data. While longitudinal studies are common in the broader NSSI research literature, the only study to examine NSSI expectations longitudinally (Zanarini et al., 2013) merely examined associations between participants’ NSSI expectations and the number of NSSI episodes in their history. More research examining relationships between NSSI expectations and possible clinical correlates unfolding over time is needed. For example, the experiential avoidance model of NSSI posits that aversive states precede NSSI behaviour, NSSI behaviour leads to a short-term reduction in these states, and NSSI behaviour is maintained by negative reinforcement. Accordingly, individuals may endorse more intrapersonal and interpersonal NSSI expectations following a period of psychopathology where they have had the opportunity to consistently engage in NSSI and experience negative reinforcement.

It is important to address these limitations for several reasons. First, model misspecification may obscure or attenuate relationships between interpersonal NSSI expectations and relevant clinical correlates. If this is the case, this might explain why associations between interpersonal NSSI expectations, depression and suicidality are not observed in some studies (Kumar et al., 2004; Nock et al., 2005) and are potentially weaker than between intrapersonal NSSI expectations, depression, and suicidality in others (Hilt et al., 2008; Klonsky et al., 2009). Second, a longitudinal design would
substantiate associations between NSSI expectations and clinical correlates observed using cross-sectional designs by determining whether contemporaneous associations persist over time and providing evidence of a temporal relationship (e.g., that depression and suicidality may predict subsequent changes in NSSI expectations).

Third, clarifying these relationships has clear clinical implications. Understanding reasons for engaging in NSSI as well as clinical correlates related to maintaining NSSI may lead to interventions that are better tailored to the individual such that they are better tolerated (e.g., less drop-out), more effective, and easier to implement (e.g., less resource intensive).

The Current Study

Aim 1 of this study was to examine associations between NSSI expectations and clinical correlates cross-sectionally and longitudinally using data collected in 3-month intervals over 24 months. To date, evidence for differential relationships between intrapersonal versus interpersonal expectations and distinct clinical correlates is primarily derived from cross-sectional studies involving methods that may not consider when linear and nonlinear relationships. To address this limitation, this study used linear and non-linear models where appropriate, as guided by the distribution of NSSI expectation endorsements observed in the current and previous studies. Consistent with previous research findings, Hypothesis 1a was that suicidality and depressive features would be positively associated with greater endorsement of intrapersonal NSSI expectations cross-sectionally. Hypothesis 1b was that suicidality and depressive features at each time point would be positively associated with greater endorsement of intrapersonal NSSI expectations at the subsequent time point (i.e., 3 months later). Hypothesis 1c
was that greater suicidality and depressive features as well as lower social support satisfaction would be associated with the endorsement of interpersonal NSSI expectations cross-sectionally. Hypothesis 1d was that greater suicidality and depressive features as well as lower social support satisfaction at each time point would be positively associated with greater endorsement of interpersonal NSSI expectations at the subsequent time point.

Aim 2 was to examine whether intrapersonal and interpersonal NSSI expectations are differentially associated with particular clinical problem domains. These differences were examined cross-sectionally as well as longitudinally and examined suicidality and depressive symptoms separately, resulting in four hypothesis tests, 2ai, 2aii, 2bi, 2bii. Hypothesis 2ai was that suicidality was more strongly associated with intrapersonal NSSI expectations than interpersonal NSSI expectations cross-sectionally. Hypothesis 2aii was that depressive symptoms were more strongly associated with intrapersonal NSSI expectations than interpersonal NSSI expectations cross-sectionally. Hypothesis 2bi was that suicidality at each time point was more strongly associated with intrapersonal NSSI expectations at the next time point (i.e., 3 months later) than with interpersonal NSSI expectations at the next time point. Hypothesis 2bii was that depressive symptoms at each time point were more strongly associated with intrapersonal NSSI expectations at the next time point than with interpersonal NSSI expectations at the next time point. These differential relationships between each NSSI expectation, depression, and suicidality were examined using correlation pattern analysis (Fouladi & Serafini, 2018; Steiger & Hakstian, 1984).
Aim 3 was to explore associations of NSSI expectations with clinical correlates that have not been as thoroughly examined in the literature as suicidality, depression, and social support. Supplementary analyses of relationships between general anxiety (characterized by tension and panic), phobic anxiety (characterized by behavioural avoidance), interpersonal sensitivity and NSSI expectations were conducted cross-sectionally and longitudinally without a priori hypotheses. While theory indicates that reducing these internal states could drive NSSI behaviours, it is less clear from previous research which NSSI expectations, if any, may be involved.
2. METHODS

Participants

Participant data were collected as part of a previous research study investigating potential protective factors for NSSI (Turner, 2010; Turner, Chapman, & Gratz, 2014). Participants were 211 individuals (197 female gender, 14 male gender, as ascertained by self-report) recruited from online support forums and social networking sites related to NSSI, including Dailystrength.org, LiveJournal.com, and Facebook. To be eligible for inclusion in the original study, participants had to be at least 16 years old and to have engaged in NSSI at least once in their lifetime.

For the present study, the sample was further restricted to 197 female participants (Mage = 22.63, SDage = 6.88). Males were excluded from analyses given the small number of male respondents and previous differences between males and female in NSSI engagement reported in the literature (Andover et al., 2010; Whitlock et al., 2011). Most of the participants reported residing in the United States (51.8%), Canada (17.8%), the United Kingdom (12.2%), and Australia (6.6%). Most participants reported their ethnicity as Caucasian (87.3%). For more demographic information, refer to Table 1.

With respect to NSSI engagement, 13.1% of participants reported that they engaged in NSSI daily, 24.3% reported that they engaged in NSSI 3-6 times per week, 16.2% reported that they engaged in NSSI 1-2 times per week, 23.9% reported that they engaged in NSSI 2-3 times per month, 19.3% reported that they engaged in NSSI once per month or less often, and six participants did not respond. When asked about
the past 3 months, 5.1% reported daily NSSI, 13.7% reported 3-6 times per week, 17.8% reported 1-2 times per week, 20.8% reported 2-3 times per month, 21.8% reported once per month or less, 18.3% reported they hadn’t engaged in NSSI in the past 3 months, and 5 participants did not respond. In terms of methods, 95.9% reported having engaged in cutting in their lifetime, with scratching skin until bleeding (58.4%), hitting oneself (57.9%), burning (46.2%), and banging one’s head against the wall (37.1%) commonly endorsed.

**Procedures**

Participants were recruited by advertising a study examining “how emotions, life experiences, stress and coping styles affect self-harm,” on NSSI-related online forums and social networking groups related to NSSI located within dailystrength.org, livejournal.com, and facebook.com. Group administrators were provided details about the study and recruitment information was posted to these groups with the administrators’ permission. Participants emailed the research team and were provided with secure login and password information to use to complete online questionnaires via Remark Web Survey. Questionnaires included online consent forms, a demographics questionnaire, as well as a series of self-report measures. Measures relevant for this study are described below. Initial questionnaires took approximately two hours to complete. Participants were re-contacted every 3 months via email to collect follow-up data and were given the opportunity to opt-out of follow-up at any time.

Participants who consented to the follow-up phase of the study were asked to complete additional questionnaires every 3 months for up to 24 months. This meant that
participants were contacted to complete questionnaires at nine possible time points—baseline questionnaires plus at 3, 6, 9, 12, 15, 18, 21, and 24 months post-baseline questionnaires. Participants were emailed one week before each scheduled follow-up date, and every week thereafter until they either completed follow-up questionnaires or indicated they would not be able to do so. Participants were compensated with a choice of electronic gift certificates to Amazon.com or PayPal.com (valued at 5$ CAD) after completion of questionnaires at baseline and again at each follow up time point.

To manage potential distress and risk of harm, all participants concluded questionnaires by completing a positive mood induction in which they were asked to write about a time when they felt proud of themselves and a time when they felt happy. Participants were given the option of playing a soothing online game in which coloured sand can be arranged into different designs at the end of the study. Finally, participants were provided with international crisis line numbers. All procedures were approved by the Office of Research Ethics at Simon Fraser University.

**Measures**

**Demographics**

Demographic data were collected with a brief online measure asking participants to report their age, sex, ethnicity/race, country of origin, country of residence, level of education, and income (see Table 1).

**Nonsuicidal Self-Injury**

Experiences with NSSI were assessed using an English language version of the Questionnaire for Non-Suicidal Self-Injury (QNSSI; Kleindienst et al., 2008). This
questionnaire asks participants to report on the frequency, methods, and expectations of NSSI, as well as emotions and experiences before and after NSSI. This questionnaire was previously adapted and translated from German via two rounds of forward and back translation (Turner et al., 2012). This questionnaire assesses the frequency, methods, and functions of NSSI, as well as expectations and emotions related to NSSI.

Reported NSSI expectations were assessed using a composite measure combining a subset of items from the QNSSI with additional items from the Suicidal Attempt Self-Injury Interview (SASII; Linehan, Comtois, Brown, Heard, & Wagner, 2006), resulting in a final set of 22 items. Items were incorporated from both scales to assess a more complete set of NSSI expectations than either scale addresses alone. The final item list was chosen based on a previous exploratory factor analysis of QNSSI and SASII responses (Turner et al., 2012) that indicated the following five factor solution: emotion regulation (e.g., “to obtain relief from a terrible state of mind”; n items = 9, α = .83), feeling generation (e.g., “to feel something, even if it was pain”; n items = 4, α = .83), interpersonal influence (e.g., “to get back at or hurt someone”; n items = 3, α = .81), interpersonal communication (e.g., “to communicate or let others know how desperate I am”; n items = 3, α = .74), and self-punishment (e.g., “to punish myself”; n items = 3, α = .64). For each item, participants endorsed how often they engaged in NSSI for a stated reason on a 5-point Likert scale (1 = Never to 5 = Always). For more information on specific items, see Table 2.

For the present study, emotion regulation, self-punishment and feeling generation scales were subsumed within a superordinate intrapersonal NSSI
expectations factor, whereas interpersonal communication and interpersonal influence were subsumed within the interpersonal NSSI expectations factor. This reflects research findings suggesting that self-reported NSSI functions group into two factors (e.g., Klonsky & Glenn, 2009), and the pattern of subscale correlations reported in Table 3.

**Suicidality**

Participants completed the Suicide Behaviour Questionnaire-Revised (SBQ-R; Osman et al., 2001) at baseline and each follow-up to obtain a global measure of the severity of suicidal thoughts and behaviours based on participants’ history and their beliefs about the likelihood of future suicide thoughts, attempts and death by suicide. Osman et al. (2001) assessed the internal consistency of the SBQ-R for adult inpatients (α = .88), adult undergraduate students (α = .76), and high school students (α = .87), and also demonstrated convergent validity in these samples. The internal consistency in the current study fell within this range (α = .77).

**Severity of Psychopathology Symptoms**

Participants completed the 53-item Brief Symptom Inventory (BSI; Derogatis, 1993) at baseline and each follow-up, rating distress of various psychological symptoms on a 5-point scale, ranging from 0 (*not at all*) to 4 (*extremely*). The BSI yielded several scores that were examined in the present study.

The depression subscale of the BSI was used to assess severity of depressive symptoms. Items on this scale reflect withdrawal of life interest, lack of motivation, and loss of energy, feelings of hopelessness, and thoughts of suicide. The sum of item
responses indicates the overall severity of depressive symptoms, with higher scores corresponding to more severe symptoms.

Severity of anxiety symptoms was assessed using the anxiety subscale of the BSI, with items on this scale capturing general nervousness and tension, as well as panic attacks and feelings of terror and apprehension. Higher scores indicate higher levels of general anxiety.

The BSI phobic anxiety subscale assessed anxiety symptoms characterized by irrational, persistent, and disproportionate fear responses to a specific person, place, object, or situation (e.g., agoraphobia). Phobic anxiety also includes items reflecting anxiety-related avoidance or escape behaviors. Higher scores indicate higher levels of phobic anxiety.

Finally, interpersonal sensitivity was also assessed using a BSI subscale. Interpersonal sensitivity captures feelings of inadequacy and inferiority in comparison to others, self-deprecation, self-doubt, and discomfort during interpersonal interactions. Individuals with high scores tend to report others perceive them negatively and hold negative expectations concerning interpersonal behavior.

The internal consistencies of the depression (α = .86), anxiety (α = .85), phobic anxiety (α = .82), and interpersonal sensitivity (α = .80) BSI subscales for the present sample were consistent with those demonstrated in prior research on the BSI (Derogatis, 1993; Dixon-Gordon et al., 2011; Turner et al., 2012).
Social Support Satisfaction

Social support satisfaction was assessed using a 6-item short form of the Social Support Questionnaire (SSQ6; Sarason et al., 1987). Each item has two parts. Individuals are first asked to identify individuals they believe they can turn to for support in a variety of situations (e.g., when worried or under stress, when very upset). An individuals’ number of social supports is the mean number of identified individuals across the six items. Individuals are then asked to rate their level of satisfaction with perceived support available in that situation on a 6-point Likert scale ranging from 1 (very dissatisfied) to 6 (very satisfied). An individuals’ social support satisfaction is the mean rating of satisfaction across the six items. The internal consistency of social support satisfaction in the current study (α = .82) is concordant with psychometrics in prior validation studies (Sarason et al., 1987).

Data Analytic Plan

Aim 1: Cross-sectional and longitudinal associations of NSSI expectations with severity of suicidality, depressive symptoms, social support satisfaction

Hypothesis 1a was that suicidality and depressive features would be positively associated with greater endorsement of intrapersonal NSSI expectations cross-sectionally. To test this hypothesis, contemporaneous associations of intrapersonal NSSI expectations with suicidality and depressive symptoms were tested in a series of random intercept multilevel models to account for the structure of the data, with repeated measures nested within individuals (Finch, Bolin, & Kelley, 2014). Linear
models were implemented and analyzed using R 3.6.2 (R Core Team, 2019), using the nlme package (Pinheiro et al., 2018). The primary focus of these analyses (as well as the analyses in Aim 3) was interpreting between-person relationships after accounting for the within-person effect of time. With this emphasis on interpreting level-2 (between-person) intercepts, predictor variables in these multilevel models were grand mean centred (Finch et al., 2014). Clinical correlates were entered into all models as fixed effects.

Intrapersonal NSSI expectations were first regressed on linear and quadratic time, included as fixed effects and random effects. This models the possibility that of an overall change in intrapersonal NSSI expectations over time (i.e., across participants) and that trajectories of change over time also vary by participant. Multilevel regression equations of the contemporaneous associations between clinical correlates and intrapersonal NSSI expectations were then fit to the data. For contemporaneous associations, it was predicted that suicidality and depressive symptoms would each be associated with intrapersonal NSSI expectations when entered into a single omnibus regression.

Hypothesis 1b was that suicidality and depressive features at each time point would be positively associated with greater endorsement of intrapersonal NSSI expectations at the subsequent time point (i.e., 3 months later). To test this hypothesis, longitudinal associations between intrapersonal NSSI expectations, suicidality, and depressive symptoms were then tested using multilevel lagged regression equations. As with tests of contemporaneous associations, fixed and random effects of linear and quadratic time were added to these models. For longitudinal associations, it was
predicted that suicidality at time t-1 and depressive symptoms at time t-1 would each be associated with intrapersonal NSSI expectations at time t (i.e., 3 months later) when entered into a single omnibus regression, with intrapersonal NSSI expectations at time t-1 included as a covariate.

Hypothesis 1c was that greater suicidality and depressive features as well as lower social support satisfaction would be associated with the endorsement of interpersonal NSSI expectations cross-sectionally. To test this hypothesis, contemporaneous associations of intrapersonal NSSI expectations with suicidality and depressive symptoms were tested in a series of random intercept multilevel models that resembled those used with intrapersonal NSSI expectations with one notable exception. Analyses of data from previous studies (e.g., Turner et al, 2012) indicated qualitative differences in the distribution of interpersonal NSSI expectations from intrapersonal NSSI expectations. Specifically, item level responses were zero-inflated and positively skewed, suggesting that modeling the relationship between interpersonal NSSI expectations and other clinical constructs was likely to produce residuals that were not normally distributed. As a result, interpersonal NSSI expectations were dichotomized before inclusion in models which were tested via multilevel logistic regression to account for nested data and a dichotomous criterion variable (Finch et al., 2014). Interpersonal NSSI expectations at or above a rating of 2.00 (corresponding to a mean rating of “sometimes”) were recoded as present, with lower ratings recoded as absent.

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1 Analyses using linear models and untransformed interpersonal NSSI expectations were also conducted. Results from these analyses were consistent with nonlinear models presented throughout.
These models were implemented and analyzed using the lme4 package in R (Bates et al., 2015).

Multilevel regression equations were fit to the data, including fixed and random effects of linear and quadratic time and the fixed effects of suicidality, depressive symptoms, and social support satisfaction on and interpersonal NSSI expectations. For contemporaneous associations, it was predicted that suicidality, depressive symptoms, social support satisfaction would each be associated with interpersonal NSSI expectations when entered into a single omnibus regression.

Hypothesis 1d was that greater suicidality and depressive features as well as lower social support satisfaction at each time point would be positively associated with greater endorsement of interpersonal NSSI expectations at the subsequent time point (i.e., 3 months later). To test this hypothesis, longitudinal associations between interpersonal NSSI expectations, suicidality, depressive symptoms, and social support satisfaction were then tested using multilevel lagged logistic regression equations. Here it was predicted that suicidality at time t-1, depressive symptoms at time t-1, and social support satisfaction at time t-1 would each be associated with intrapersonal NSSI expectations at time t (i.e., 3 months later) when entered into a single omnibus regression that included interpersonal NSSI expectations at time t-1 as a covariate.

**Aim 2: Differential associations of intrapersonal and interpersonal NSSI expectations with suicidality and depressive symptoms**

Hypothesis 2ai was that suicidality was more strongly associated with intrapersonal NSSI expectations than interpersonal NSSI expectations cross-sectionally. Hypothesis 2a(ii) was that depressive symptoms were more strongly
associated with intrapersonal NSSI expectations than interpersonal NSSI expectations cross-sectionally. These hypotheses were tested by comparing correlations of variables that were centred using within-timepoint means using two-stage asymptotically distribution-free correlation pattern analysis (Fouladi et al., 2018; Steiger & Hakstian, 1984). It was predicted that i) the correlation between intrapersonal NSSI expectations and suicidality would be larger than the correlation between interpersonal NSSI expectations and suicidality and, ii) the correlation between intrapersonal expectations and depressive symptoms would be larger than the correlation between interpersonal NSSI expectations and depressive symptoms.

Hypothesis 2bi was that suicidality at each time point was more strongly associated with intrapersonal NSSI expectations at the next time point (i.e., 3 months later) than with interpersonal NSSI expectations at the next time point. Hypothesis 2bi was that depressive symptoms at each time point were more strongly associated with intrapersonal NSSI expectations at the next time point than with interpersonal NSSI expectations at the next time point. These hypothesis were tested by comparing correlations using correlation pattern analysis where it was predicted that i) the correlation between intrapersonal NSSI expectations at time $t$ and suicidality at time $t - 1$ would be larger than the correlation between interpersonal NSSI expectations at time $t$ and suicidality at time $t - 1$, ii) the correlation between intrapersonal expectations at time $t$ and depressive symptoms at time $t - 1$ would be larger than the correlation between interpersonal NSSI expectations at time $t$ and depressive symptoms and time $t - 1$. 
Aim 3: Explore associations of NSSI expectations with other clinical correlates

A series of exploratory multilevel analyses were then conducted investigating possible relationships between NSSI expectations and the following clinical correlates: interpersonal sensitivity, anxiety, phobic anxiety. Intrapersonal NSSI expectations were regressed on the fixed and random effects of linear and quadratic time and the fixed effects of suicidality, depressive symptoms, interpersonal sensitivity, anxiety, and phobic anxiety. Multilevel lagged regressions involved intrapersonal NSSI expectations at time t regressed on the fixed and random effects of linear and quadratic time and the fixed effects of lagged (t-1) intrapersonal NSSI expectations, lagged suicidality, lagged depressive symptoms, lagged interpersonal sensitivity, lagged anxiety, and lagged phobic anxiety.

Equivalent multilevel logistic regressions explored relationships between interpersonal NSSI expectations and these additional clinical correlates. Interpersonal NSSI expectations were regressed on the fixed and random effects of linear and quadratic time and the fixed effects of suicidality, depressive symptoms, social support satisfaction, interpersonal sensitivity, anxiety, and phobic anxiety. Interpersonal NSSI expectations at time t regressed on the fixed and random effects of linear and quadratic time and the fixed effects of lagged (t-1) interpersonal NSSI expectations, lagged suicidality, lagged depressive symptoms, lagged social support satisfaction, lagged interpersonal sensitivity, lagged anxiety, and lagged phobic anxiety.
3. RESULTS

Missing Data and Loss to Follow-up

Of the 197 participants who submitted baseline (T1) questionnaires, 82 participants (42%) completed study measures at 3-months follow-up (T2), 69 participants (36%) completed study measures at 6 months (T3), 62 participants (32%) completed study measures at 9 months (T4), 46 participants (24%) completed questionnaires at 12 months (T5), 28 participants (15%) completed questionnaires at 15 months (T6), and the remaining 24 participants (12%) completed questionnaires at 18 months, 21 months, and 24 months (T7-T9). Participants with missing and non-missing data were compared at previous time-points; pairwise t-tests indicated no significant differences on demographics or study variables, ps > .05. To account for missing data, regression analyses estimated parameters using maximum likelihood estimation.

Descriptive Statistics

Means and standard deviations for individuals at each time point are in Table 4. Individuals typically endorsed intrapersonal NSSI expectations with mean ratings between Sometimes and Often. Interpersonal NSSI expectations were endorsed less strongly, with mean ratings between Never and Seldom.

Examination of the distribution properties of study variables revealed interpersonal NSSI expectations were positively skewed and significantly non-normal (Shapiro-Wilk W = 0.88, p < .001). Interpersonal NSSI expectations had a modal response of 0. Subsequent linear models that included interpersonal NSSI expectations had non-normally distributed residuals, violating an assumption of linear models. As a result,
interpersonal NSSI expectations were dichotomized and analyses where this variable was an outcome measure involved logistic regression.

**Unconditional Growth Models**

To account for possible linear and quadratic change in NSSI expectations over time, unconditional growth models were tested. A significant positive regression coefficient for quadratic time, $\gamma_{20} = 0.01$, $p < .05$, and a non-significant coefficient for linear time, $p > .05$, indicated that, on average, intrapersonal NSSI expectations decreased initially over time and subsequently increased, reverting to levels reported at baseline. Random effects for linear time, $SD_{\mu_{1j}} = 0.06$, 95% CI [0.04, 0.09], and for quadratic time $SD_{\mu_{2j}} = 0.02$, 95% CI [0.01, 0.03] indicated that trajectories also varied across participants.

With respect to interpersonal NSSI expectations, a significant negative regression coefficient for linear time, $\gamma_{10} = -0.72$, $p < .05$, and a non-significant coefficient for quadratic time, $p > .05$, indicated that, on average, the odds for endorsing interpersonal NSSI expectations decreased slightly over time ($e^{-0.72} = 0.49$). A standard method of determining confidence intervals around random effects does not exist for multilevel logistic regression using lme4 (Bates, et al., 2015), however the inclusion of the random effect of linear time improved overall model fit ($\chi^2 = 17.84$, $p < .001$). Quadratic time was dropped from subsequent models.
Aim 1: Cross-sectional and longitudinal associations of NSSI expectations with severity of suicidality, depressive symptoms, social support satisfaction

Hypothesis 1a was that suicidality and depressive features would be positively associated with greater endorsement of intrapersonal NSSI expectations cross-sectionally. In order to test this hypothesis, suicidality and depressive symptoms were entered simultaneously into a multilevel linear regression, with linear and quadratic time as covariates (Table 5). The final model equations are as follows:

Level 1: \[ Y_{ij} = \beta_0j + \beta_1jTime + \beta_2jTime^2 + \beta_3jSuicidality + \beta_4jDepression + R_{ij} \]  

Level 2: \[ \beta_0j = \gamma_00 + \mu_{0j} \]  
\[ \beta_1j = \gamma_{10} + \mu_{1j} \]  
\[ \beta_2j = \gamma_{20} + \mu_{2j} \]  
\[ \beta_3j = \gamma_{30} \]  
\[ \beta_4j = \gamma_{40} \]

In this model, suicidality was positively associated with intrapersonal NSSI expectations, \( \beta_3 = 0.10, SE = .03, p < .01 \). Depressive symptoms were also positively associated with intrapersonal NSSI expectations, \( \beta_4 = 0.12, SE = .03, p < .001 \).
Hypothesis 1b was that suicidality and depressive features at each time point would be positively associated with greater endorsement of intrapersonal NSSI expectations at the subsequent time point (i.e., 3 months later). To test this hypothesis, suicidality and depressive symptoms at time \( (t - 1) \) were simultaneously entered into a single lagged regression that included linear time, quadratic time, and intrapersonal NSSI expectations at time \( (t - 1) \) as covariates. This model took the following form:

\[
\begin{align*}
\text{Level 1:} \quad Y_{ijt} &= \beta_{0j} + \beta_{1j}Time_t + \beta_{2j}Time_t^2 + \beta_{3j}IntraNSSI_{t-1} + \\
&\quad \beta_4Suicidality_{t-1} + \beta_5Depression_{t-1} + R_{ij} \\
\text{Level 2:} \quad \beta_{0j} &= \gamma_{00} + \mu_{0j} \quad (7) \\
\beta_{1j} &= \gamma_{10} + \mu_{1j} \quad (8) \\
\beta_{2j} &= \gamma_{20} + \mu_{2j} \quad (9) \\
\beta_{3j} &= \gamma_{20} \quad (10) \\
\beta_{4j} &= \gamma_{30} \quad (11) \\
\beta_{5j} &= \gamma_{30} \quad (12)
\end{align*}
\]

In this model, depressive features were positively associated with intrapersonal NSSI expectations at the following time point (i.e., 3 months later), \( \beta_5 = 0.07, \ SE = 0.07, \ p < .05 \). Suicidality was not significantly associated with intrapersonal NSSI expectations (above and beyond other predictors in the model) 3 months later, \( p > .05 \) (Table 5).
Hypothesis 1c was that greater suicidality and depressive features as well as lower social support satisfaction would be associated with the endorsement of interpersonal NSSI expectations cross-sectionally. To test this hypothesis, suicidality, depressive symptoms and social support satisfaction were entered simultaneously into a random intercept multilevel logistic regression, with linear time as covariate. Quadratic time was not significantly associated with interpersonal NSSI expectations in the unconditional growth model and was dropped from subsequent final models. The final model equations were as follows:

\[
\text{Level 1: } \ln\left(\frac{p}{1-p}\right) = \beta_{0j} + \beta_{1j} \text{Time} + \beta_{2} \text{Suicidality} + \beta_{3} \text{Depression} + \beta_{4} \text{Support} \\
\]

\[
\text{Level 2: } \beta_{0j} = \gamma_{00} + \mu_{0j} \\
\beta_{1j} = \gamma_{10} + \mu_{1j} \\
\beta_{2j} = \gamma_{20} \\
\beta_{3j} = \gamma_{30} \\
\beta_{4j} = \gamma_{40}
\]

In this model, depressive symptoms were positively associated with interpersonal NSSI expectations, \( \beta_3 = 0.48, \exp(\beta_3) = 1.61, \text{SE} = .24, p < .05 \). Neither suicidality, nor
social support satisfaction were associated with interpersonal NSSI expectations above and beyond other predictors in the model, ps > .05 (Table 6).

Hypothesis 1d was that greater suicidality and depressive features as well as lower social support satisfaction at each time point would be positively associated with greater endorsement of interpersonal NSSI expectations at the subsequent time point (i.e., 3 months later). To test this hypothesis, suicidality and depressive symptoms at time \((t - 1)\) were simultaneously entered into a single lagged regression that included linear time and intrapersonal NSSI expectations at time \((t - 1)\) as covariates. This model resulted in a singular fit, potentially a result of overfitting. As a result, a less complex model dropping the random effect of time was fit to the data. This model took the following form:

\[
\text{Level 1: } \ln \left( \frac{p}{1-p} \right)_t = \beta_0 + \beta_1 \text{Time}_t + \beta_2 \text{InterNSSI}_{t-1} + \\
\beta_3 \text{Suicidality}_{t-1} + \beta_4 \text{Depression}_{t-1} + \beta_5 \text{Support}_{t-1} + R_{ij}
\]

\[
\text{Level 2: } \beta_{0j} = \gamma_{00} + \mu_{0j}
\]

\[
\beta_{1j} = \gamma_{10} + \mu_{1j}
\]

\[
\beta_{2j} = \gamma_{20}
\]

\[
\beta_{3j} = \gamma_{30}
\]

\[
\beta_{4j} = \gamma_{40}
\]

---

2 Using an equivalent linear model where interpersonal NSSI expectations were not transformed, depressive symptoms were positively associated with interpersonal NSSI expectations, \(\beta_3 = 0.09, SE = 0.03, p < .05\). Neither suicidality, nor social support satisfaction were associated with interpersonal NSSI expectations above and beyond other predictors in the model, ps > .05.
No clinical correlates in this model were associated with (i.e., did not prospectively predict) interpersonal NSSI expectations, \( ps > .05 \) (Table 6)\(^3\).

**Aim 2: Differential associations of intrapersonal and interpersonal NSSI expectations with suicidality and depressive symptoms**

Hypothesis 2ai was that suicidality was more strongly associated with intrapersonal NSSI expectations than interpersonal NSSI expectations cross-sectionally. Hypothesis 2aii was that depressive symptoms were more strongly associated with intrapersonal NSSI expectations than interpersonal NSSI expectations cross-sectionally. Omnibus tests of correlation patterns at each timepoint (Table 7) indicated differences between correlations involving intrapersonal NSSI expectations and interpersonal NSSI expectations at baseline, \( \chi^2 (2, N = 190) = 7.23, p < .05 \), and at 1-year follow-up \( \chi^2 (2, N = 44) = 6.69, p < .05 \). Differences at the seven other timepoints were non-significant, \( ps > .05 \). Focal probes of significant omnibus tests indicated that the magnitude of the correlation between suicidality and intrapersonal NSSI expectations was greater than the correlation between suicidality and interpersonal NSSI expectations at baseline, \( \chi^2 (1, N = 190) = 4.09, p < .05 \), and at 1-year follow-up, \( \chi^2 (1, N = 44) = 4.06, p < .05 \). Similarly, the correlation between depressive symptoms and intrapersonal NSSI expectations was greater than the correlation between

\[ \beta_{5j} = \gamma_{50} \] (21)

\(^3\) Using an equivalent linear model where interpersonal NSSI expectations were not transformed, clinical correlates in this model were not associated with (i.e., did not prospectively predict) interpersonal NSSI expectations, \( ps > .05 \)
depressive symptoms and interpersonal NSSI expectations at baseline, $\chi^2 (1, N = 190) = 6.31, p < .05$, and at 1-year follow-up, $\chi^2 (1, N = 44) = 5.76, p < .05$. Altogether, a small number of comparisons were marginally significant (two of nine for Hypothesis 2ai, two of nine for Hypothesis 2aii), with $p$-values between .01 and .05. Alternative analyses using more a liberal sample size adjustment are discussed in Appendix B.

Hypothesis 2bi was that suicidality at each time point was more strongly associated with intrapersonal NSSI expectations at the next time point (i.e., 3 months later) than with interpersonal NSSI expectations at the next time point. Hypothesis 2bi was that depressive symptoms at each time point were more strongly associated with intrapersonal NSSI expectations at the next time point than with interpersonal NSSI expectations at the next time point. Omnibus tests of correlation patterns across each pair of neighbouring timepoints indicated differences between clinical variables predicting intrapersonal NSSI expectations compared to interpersonal NSSI expectations from 6-month to 9-month follow-up, $\chi^2 (2, N = 50) = 8.63, p < .01$, from 9-month to 1-year follow-up $\chi^2 (2, N = 30) = 7.45, p < .05$, and from 1-year to 15-month follow-up, $\chi^2 (2, N = 14) = 6.95, p < .05$. Focal probes of significant omnibus tests indicated that the correlation of suicidality predicting intrapersonal NSSI expectations was greater than the correlation between suicidality predicting interpersonal NSSI expectations from 6-month to 9-month follow-up, $\chi^2 (1, N = 50) = 7.51, p < .01$, and from 9-month to 1-year follow-up, $\chi^2 (1, N = 30) = 5.35, p < .05$. The correlation of depressive symptoms predicting intrapersonal NSSI expectations was also greater than the correlation of depressive symptoms predicting interpersonal NSSI expectations from 6-month to 9-month follow-up, $\chi^2 (1, N = 50) = 5.36, p < .05$, and from 9-month to 1-
year follow-up, $\chi^2 (1, N = 30) = 5.35$, $p < .05$. Taken together these analyses reveal a small number of marginally significant differences (two of eight for Hypothesis 2bi, two of eight for Hypothesis 2bii). Alternative analyses are discussed in Appendix B.

**Aim 3: Explore associations of NSSI expectations with other clinical correlates**

Relationships between NSSI expectations and additional clinical correlates were explored by adding interpersonal sensitivity, anxiety, and phobic anxiety to the contemporaneous and longitudinal multilevel models outlined previously. Testing the expanded contemporaneous model of intrapersonal NSSI expectations regressed on suicidality, depressive symptoms, interpersonal sensitivity, anxiety, and phobic anxiety indicated revealed significant positive relationships between intrapersonal NSSI expectations and suicidality, $\beta_3 = 0.11$, $SE = .03$, $p < .01$; anxiety, $\beta_6 = 0.08$, $SE = .03$, $p < .05$; and phobic anxiety, $\beta_7 = 0.12$, $SE = .04$, $p < .001$ (Table 8). With these additional coefficients in the model, the association between intrapersonal NSSI expectations and depressive symptoms was no longer significant, $p > .05$. In the expanded longitudinal model, none of the $(t - 1)$ lagged clinical correlates—suicidality, depression, interpersonal sensitivity, anxiety, or phobic anxiety—were significantly associated with intrapersonal NSSI expectations at time $t$, $ps > .05$ (Table 8). In the expanded contemporaneous model of interpersonal NSSI expectations on suicidality, depression, social support satisfaction, interpersonal sensitivity, anxiety, and phobic anxiety, only the positive association between depressive symptoms was significant, $\beta_4 = 0.62$. 
exp(β₄) = 1.85, SE = .30, p < .05 (Table 9)⁴. In the expanded longitudinal model, interpersonal sensitivity at time (t − 1) positively predicted interpersonal NSSI expectations at time t (i.e., 3 months later), β₅ = 0.73, exp(β₅) = 2.07, SE = .34, p < .05 (Table 9)⁵.

⁴ In contrast, in an equivalent linear model where interpersonal NSSI expectations were untransformed, none of the clinical correlates were associated with interpersonal NSSI expectations, ps > .05.

⁵ In an equivalent linear model where interpersonal NSSI expectations were untransformed, interpersonal sensitivity at time (t − 1) positively predicted interpersonal NSSI expectations at time t (i.e., 3 months later), β₅ = 0.13, SE = .05, p < .05.
This study examined relationships between the expectations about engagement in NSSI behaviors and clinical correlates among individuals who engage in these behaviors using an online sample. Consistent with predictions, intrapersonal NSSI expectations were positively associated with suicidality and depressive symptoms assessed contemporaneously. These findings supported the validity of theoretical models that propose that NSSI is maintained by reducing aversive physiological, emotional or cognitive states as well as by introducing or amplifying desired internal states (Chapman et al., 2006; Klonsky et al., 2008; Nock et al., 2004). These findings also contribute to a literature that suggests NSSI may operate as functionally similar replacement behaviours for suicide attempts in certain contexts (Nock et al., 2005; Klonsky, 2007), despite evidence that engagement in NSSI over time contributes to risk of suicide attempts (Asarnow et al., 2011; Guan et al., 2011; Wilkinson et al., 2011).

As predicted, depressive symptoms positively predicted intrapersonal NSSI expectations reported 3 months later. These prospective findings are novel, given the reliance of previous studies on cross-sectional designs. Although not tested directly in the present study, I hypothesize that depressive phenomena such as cognitive distortions and self-focused attention influence beliefs about the specific benefits of NSSI behaviour (Cristea et al., 2015; Drapeau et al., 2019). Depressive symptoms may increase the reinforcement properties of NSSI motivated by intrapersonal reasons by generating aversive internal states directly and by directing attention to the short-term relief from these states following NSSI (Miltenberger, 2005). Affective and motivational depressive features (e.g., dysphoric mood, anhedonia) provide regular opportunity to
engage in NSSI in the service of relief from aversive internal states. Cognitive biases toward suppression and avoidance and away from distress tolerance may intrapersonal NSSE expectations more salient, personally relevant, or appealing (Glenn et al., 2016).

Contrary to contemporaneous results, suicidality did not predict intrapersonal NSSI expectations 3 months later (above and beyond the variability explained by depressive features). This highlights the importance of longitudinal research as the possible presence of confounding variables may explain the contemporaneous association between suicidality and intrapersonal NSSI expectations reported in cross-sectional studies. It could be, for example, that suicidality and intrapersonal expectations are associated with severity of psychopathology, and this could explain their cross-sectional association. Another possibility is that any longitudinal relationship between suicidality and intrapersonal NSSI expectations unfolds over a relatively brief time interval (e.g., minutes, hours, or days) and disappears over a longer period of weeks to months. A third possibility is that this potential relationship is difficult to detect independent of the association between depression and intrapersonal NSSI expectations. Observations of zero-order correlations between i) time-lagged suicidality and intrapersonal NSSI expectations, and ii) suicidality and depressive features supports this interpretation (Table 7).

The patterns of contemporaneous associations of interpersonal expectations with other study variables warrants discussion. Similar to intrapersonal NSSI expectations, and consistent with other research (Bentley et al., 2015; Nock et al., 2005), interpersonal NSSI expectations were positively associated with depressive symptoms contemporaneously. Contemporaneous associations between interpersonal NSSI

39
expectations and suicidality and social support satisfaction were non-significant. For suicidality this may reflect using a measure of suicidality in the current study that primarily indexed history of suicide behaviours (e.g., past suicide attempts) and perceived likelihood of future attempts rather than suicide ideation, consistent with findings from research in non-clinical settings suggesting interpersonal NSSI expectations are positively associated with suicide ideation but not suicide attempts (Roley-Roberts et al., 2017). Similarly, social support satisfaction, as operationalized using the SSQ6, may not capture differences in social support that potentially underlie interpersonal NSSI expectations. In previous studies, social support has been understood in terms of its availability (or absence), particularly during difficult circumstances (Hilt et al., 2008; Leong et al., 2014; Martin, 2013). It is also possible that the presence of interpersonal conflict rather than the absence of social support that is related to interpersonal NSSI expectations.

Considering the longitudinal models involving interpersonal NSSI expectations, neither suicidality, depressive features, nor social support satisfaction predicted subsequent interpersonal NSSI expectations 3 months later. One possibility is that, because the distribution of endorsements of interpersonal NSSI expectations were positively skewed and zero-inflated, dichotomizing data resulted in a loss of variability. Future research analyzing interpersonal NSSI expectations using models suited for continuous zero-inflated data (e.g., hurdle models; Cragg 1971) may more accurately predict contemporaneous and longitudinal relationships.

While suicidality and depression were hypothesized to be more strongly associated with intrapersonal NSSI expectations than with interpersonal NSSI
expectations, these differences were largely unsupported by the current data, whether analyses were cross-sectional or longitudinal. Previous research findings did report differences between the association of clinical correlates with NSSI expectations (Hilt et al., 2008; Klonsky et al., 2009; Nock et al., 2005; Kumar et al., 2004). Results in the current study may reflect more explicit and conservative tests of these differences using correlation pattern analysis or limitations in sample size due to participant attrition.

Some of the findings above should be considered in the context of findings from analyses addressing Aim 3 (associations of NSSI expectations with other clinical correlates). When interpersonal sensitivity, anxiety, and phobic anxiety were added to regression models, the magnitude and results of significance tests involving suicidality and depression differed from the simpler models. Intrapersonal NSSI expectations were positively associated with anxiety and phobic anxiety. Items on the anxiety subscale reflect nervousness, tension, sudden fear, panic, and restlessness - aversive physiological and emotional responses that are downregulated through NSSI behaviour (Franklin et al., 2010; Schmahl et al., 2010). This result further corroborates associations between anxiety and intrapersonal NSSI expectations seen in other studies (Bentley et al., 2015; Klonsky et al., 2009, Leong et al., 2014). Phobic anxiety ostensibly captures anxiety features commonly associated with agoraphobia— fear in open spaces, fear while on public transportation, fear when alone, discomfort in crowds, and avoidance of threat-related stimuli. To the best of my knowledge, this subset of anxiety symptoms has not been examined in the literature on NSSI expectations; however, the content of many of these items overlap with PTSD diagnostic criteria. This includes distress and reactivity to trauma reminders (Criterion B), avoidance of trauma-
related stimuli (Criterion C), and hypervigilance (Criterion E). As previous research has indicated that PSTD symptoms and/or childhood trauma exposure is related to the endorsement of intrapersonal NSSI expectations, individuals with PTSD symptoms may endorse greater phobic anxiety as well as more interpersonal NSSI expectations (Nock et al., 2005; Roley-Roberts et al., 2017). More research is needed to clarify the nature of these relationships.

The inclusion of additional correlates in the exploratory regression analyses of intrapersonal NSSI expectations attenuated the associations between depressive symptoms and intrapersonal NSSI expectations to the extent that these relationships were no longer statistically significant contemporaneously or longitudinally. These findings suggest the possibility of collinearity among predictor variables. One possibility is that anxiety and depressive symptoms are proxies for one or more underlying constructs that are related to intrapersonal NSSI expectations. Perhaps the most straightforward explanation for this result is that when individuals who engage in NSSI are distressed, their desire to modulate their internal physiological, cognitive and affective states and their expectations that NSSI will serve such a purpose are strengthened. This possibility could be examined in future studies.

Two results from the exploratory analyses of interpersonal NSSI expectations warrant further discussion. First, depressive symptoms continued to be positively associated with interpersonal NSSI expectations in the contemporaneous model after additional predictors were included. This pattern underscores that understanding depressive features may be particularly important in individuals who engage in NSSI for interpersonal reasons and related questions are germane for future study. Second,
interpersonal sensitivity positively predicted interpersonal NSSI expectations 3 months later but was not significantly associated with interpersonal NSSI expectations contemporaneously. This may suggest a spurious result attributable to attrition or other factors endemic to longitudinal research, or that interpersonal sensitivity influences interpersonal NSSI expectations through one or more time-lagged indirect pathways. For example, research indicates that interpersonal sensitivity confers risk for depression, and that this pathway is mediated by the presence of more stressful life events over a 4-month period (Liu et al., 2014).

**Limitations**

Study findings should be interpreted in the context of the following study limitations. First, although several clinical correlates were significantly associated with NSSI expectations across multiple models, the regression coefficients were generally small. Second, this study relied upon self-report measures of NSSI behaviour and expectations as well as all clinical correlates included in analyses. Self-report measures are subject to potential biases (e.g., social desirability) or sources of error (e.g., retrospective recall) and depend upon the insight and awareness of participants into the reasons, motivations, and expectations of their NSSI behaviour. Third, this study used an online sample that differed in several respects from typical community samples, potentially threatening the generalizability of these findings to other such samples. Also related to generalizability was the exclusion of the very small sample of males from analyses for this study. Males also engage in NSSI, and some findings suggest a prevalence for males that is similar to that of females (Gratz & Chapman, 2007). Additionally, the frequency and severity of NSSI behaviours was greater in this sample
than is often observed in non-treatment seeking samples (Turner et al., 2012). This calls into question whether these results generalize to populations of interest. Another limitation has to do with the very large attrition rate throughout the 2-year follow-up period. Possible explanations for this attrition include the online nature of recruitment, assessment, and follow-up being limiting personal investment in participation or insufficient compensation for participation. Although participants who completed the study did not differ on demographic or study variables from participants who discontinued during follow-up, it is unclear if unmeasured variables are associated with drop-out from follow-up as well as the extent to which these results generalize beyond the (potentially biased) study completers. Future research should consider ways to encourage participant retention including greater compensation, revisions to follow-up contact protocols that increase engagement, and reducing task burden with shorter follow-up questionnaires. Finally, the decision to emphasize between-participant relationships by grand-mean centring clinical correlates does little to explore how clinical correlates influence each participant’s NSSI expectations relative to their own baseline (i.e., within-person changes over time). Additional research involving samples with greater participant retention should consider addressing these questions.

**Conclusions and Future Directions**

Overall, this study contributes to the existing body of research in several ways. Theoretically, this work further examines models of NSSI expectations emphasizing intrapersonal/automatic as well as intrapersonal/social categories, providing evidence that depressive symptoms and suicidality are related to both set of expectations. Future research is needed to determine whether specific depressive symptoms or suicide
thoughts and behaviours are related to specific NSSI expectations. For example, research could examine whether different depressive symptoms are related to NSSI expectations in different ways or in different contexts, with affective mood symptoms (e.g., anhedonia, dysphoria) associated with intrapersonal NSSI expectations and symptoms that are more relational in nature (e.g., feelings of worthlessness, burdensomeness, lack of belonging) associated with interpersonal NSSI expectations. Results that suggest depressive symptoms prospectively predict intrapersonal and interpersonal NSSI expectations over a subsequent 3-month period are novel. Clinically, treatment of NSSI in the context of complex clinical presentations may defer treatment of psychopathology secondary to NSSI until individuals stop engaging in NSSI, to the extent that other clinical difficulties are not clearly maintaining NSSI (Linehan). If NSSI expectations can be enhanced or partially maintained by depressive symptoms or other psychopathology, this calls for a greater examination and emphasis of related psychopathology in the functional analysis of NSSI behaviour and when prioritizing treatment targets. Subsequent longitudinal studies utilizing clinical and community samples in different contexts, investigating other clinical correlates, and examining change over time with greater granularity (e.g., hours or days) and scope (e.g., years) is a promising future direction for research. This study represents an important step toward further longitudinal work by clarifying relationships between psychopathology and NSSI expectations, and by providing preliminary evidence for temporal precedence in these relationships.
5. REFERENCES


and young adults with borderline personality disorder symptoms. *Psychiatry Research, 216, 217–222.*


# Appendix A – Tables

## Table 1

*Demographics of Online Sample*

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>White (Eastern European, etc.)</td>
<td>172</td>
<td>87.3</td>
</tr>
<tr>
<td>Black (African, Caribbean, etc.)</td>
<td>5</td>
<td>2.7</td>
</tr>
<tr>
<td>Asian (Chinese, Japanese, etc.)</td>
<td>3</td>
<td>1.6</td>
</tr>
<tr>
<td>South Asian (East Indian, Pakistani, etc.)</td>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td>Other (Not Specified)</td>
<td>5</td>
<td>2.7</td>
</tr>
<tr>
<td>Two or more ethnic backgrounds</td>
<td>11</td>
<td>5.9</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Country of Residence</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>102</td>
<td>51.8</td>
</tr>
<tr>
<td>Canada</td>
<td>35</td>
<td>17.8</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>24</td>
<td>12.2</td>
</tr>
<tr>
<td>Australia</td>
<td>13</td>
<td>6.6</td>
</tr>
<tr>
<td>New Zealand</td>
<td>5</td>
<td>2.5</td>
</tr>
<tr>
<td>Germany</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>Other (Belgium, Denmark, Finland, Greece, Italy, Japan,</td>
<td>15</td>
<td>7.6</td>
</tr>
<tr>
<td>Mexico, Netherlands, Russia, South Africa, Thailand)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Education
<table>
<thead>
<tr>
<th>Education Level</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attended High School</td>
<td>39</td>
<td>19.8</td>
</tr>
<tr>
<td>Completed High School</td>
<td>28</td>
<td>14.2</td>
</tr>
<tr>
<td>Attended College/University</td>
<td>90</td>
<td>45.7</td>
</tr>
<tr>
<td>Completed University Degree</td>
<td>34</td>
<td>17.3</td>
</tr>
<tr>
<td>Completed Graduate Degree</td>
<td>6</td>
<td>3.0</td>
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</table>

**Income**

<table>
<thead>
<tr>
<th>Income Range</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; $34,999</td>
<td>60</td>
<td>30.5</td>
</tr>
<tr>
<td>$35,000 to $49,999</td>
<td>38</td>
<td>19.3</td>
</tr>
<tr>
<td>$50,000 to $99,999</td>
<td>31</td>
<td>15.7</td>
</tr>
<tr>
<td>≥ $100,000</td>
<td>21</td>
<td>10.7</td>
</tr>
<tr>
<td>Prefer not to respond</td>
<td>47</td>
<td>23.9</td>
</tr>
</tbody>
</table>
# Table 2

*QNSSI and SASII Expectation Items at Baseline*

<table>
<thead>
<tr>
<th>Emotion Regulation</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>To stop feeling sad</td>
<td>3.65</td>
<td>1.24</td>
</tr>
<tr>
<td>To relieve feelings of aloneness, emptiness, or isolation</td>
<td>3.91</td>
<td>1.15</td>
</tr>
<tr>
<td>To distract yourself from other problems</td>
<td>3.69</td>
<td>1.17</td>
</tr>
<tr>
<td>To obtain relief from a terrible state of mind</td>
<td>4.00</td>
<td>1.02</td>
</tr>
<tr>
<td>To stop bad feelings</td>
<td>5.06</td>
<td>0.98</td>
</tr>
<tr>
<td>To get away or escape from thoughts and memories, my feelings, other people, or myself</td>
<td>4.01</td>
<td>1.06</td>
</tr>
<tr>
<td>To bring my mood to a comfortable level</td>
<td>3.30</td>
<td>1.25</td>
</tr>
<tr>
<td>To prevent being hurt in a worse way</td>
<td>2.63</td>
<td>1.38</td>
</tr>
<tr>
<td>To relieve anxiety</td>
<td>3.90</td>
<td>1.03</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Self-Punishment</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>To punish myself</td>
<td>3.78</td>
<td>1.15</td>
</tr>
<tr>
<td>To stop feelings of self-hatred or shame</td>
<td>3.75</td>
<td>1.15</td>
</tr>
<tr>
<td>To decrease uncomfortable feelings (e.g., guilt, rage)</td>
<td>4.27</td>
<td>0.86</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Feeling Generation</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>To feel something, even if it was pain</td>
<td>3.28</td>
<td>1.39</td>
</tr>
<tr>
<td>To stop feeling numb or dead</td>
<td>3.25</td>
<td>1.42</td>
</tr>
<tr>
<td>Motivation</td>
<td>QNSSI</td>
<td>SASII</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>To feel my body again</td>
<td>2.53</td>
<td>1.35</td>
</tr>
<tr>
<td>To regain a sense of reality</td>
<td>3.00</td>
<td>1.30</td>
</tr>
</tbody>
</table>

**Interpersonal Communication**

<table>
<thead>
<tr>
<th>Motivation</th>
<th>QNSSI</th>
<th>SASII</th>
</tr>
</thead>
<tbody>
<tr>
<td>To communicate or to let others know how desperate I am</td>
<td>2.02</td>
<td>1.16</td>
</tr>
<tr>
<td>Others to see how badly I am doing</td>
<td>1.94</td>
<td>1.15</td>
</tr>
<tr>
<td>To get help</td>
<td>2.16</td>
<td>1.19</td>
</tr>
</tbody>
</table>

**Interpersonal Influence**

<table>
<thead>
<tr>
<th>Motivation</th>
<th>QNSSI</th>
<th>SASII</th>
</tr>
</thead>
<tbody>
<tr>
<td>To get back at or hurt someone</td>
<td>1.54</td>
<td>0.93</td>
</tr>
<tr>
<td>To get other people to act differently or change</td>
<td>1.54</td>
<td>0.95</td>
</tr>
<tr>
<td>To demonstrate to others how wrong they are/were</td>
<td>1.71</td>
<td>1.08</td>
</tr>
</tbody>
</table>

*Note. QNSSI = Questionnaire for Non-Suicidal Self-Injury. SASII = Suicidal Attempt Self-Injury Interview*
Table 3

*Correlation Matrix of NSSI Expectations Scales*

<table>
<thead>
<tr>
<th></th>
<th>Emotion Regulation</th>
<th>Self-Punishment</th>
<th>Feeling Generation</th>
<th>Interpersonal Communication</th>
<th>Interpersonal Influence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotion Regulation</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Self-Punishment</td>
<td>.45**</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Feeling Generation</td>
<td>.36**</td>
<td>.22**</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Interpersonal Communication</td>
<td>.05</td>
<td>.05</td>
<td>-.09</td>
<td>-</td>
<td>-.05</td>
</tr>
<tr>
<td>Interpersonal Influence</td>
<td>.03</td>
<td>.02</td>
<td>-.05</td>
<td>.47**</td>
<td>-</td>
</tr>
</tbody>
</table>

*p < .05, **p < .01, ***p < .001.*
Table 4
Descriptive Statistics for Study Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Timepoint</th>
<th>$N$</th>
<th>$M (SD)$</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intrapersonal NSSI</td>
<td>$T_1$ (baseline)</td>
<td>193</td>
<td>3.55 (0.68)</td>
<td>-0.09</td>
<td>-0.37</td>
</tr>
<tr>
<td></td>
<td>$T_2$ (3 months)</td>
<td>82</td>
<td>3.37 (0.67)</td>
<td>-0.14</td>
<td>-0.67</td>
</tr>
<tr>
<td></td>
<td>$T_3$ (6 months)</td>
<td>69</td>
<td>3.36 (0.59)</td>
<td>-0.14</td>
<td>-0.02</td>
</tr>
<tr>
<td></td>
<td>$T_4$ (9 months)</td>
<td>62</td>
<td>3.28 (0.57)</td>
<td>-0.13</td>
<td>-0.85</td>
</tr>
<tr>
<td></td>
<td>$T_5$ (12 months)</td>
<td>44</td>
<td>3.35 (0.71)</td>
<td>-0.23</td>
<td>-0.44</td>
</tr>
<tr>
<td></td>
<td>$T_6$ (15 months)</td>
<td>25</td>
<td>3.45 (0.68)</td>
<td>0</td>
<td>-0.42</td>
</tr>
<tr>
<td></td>
<td>$T_7$ (18 months)</td>
<td>19</td>
<td>3.41 (0.59)</td>
<td>-0.52</td>
<td>-0.09</td>
</tr>
<tr>
<td></td>
<td>$T_8$ (21 months)</td>
<td>21</td>
<td>3.30 (0.86)</td>
<td>-0.80</td>
<td>0.62</td>
</tr>
<tr>
<td></td>
<td>$T_9$ (24 months)</td>
<td>22</td>
<td>3.33 (0.78)</td>
<td>-0.24</td>
<td>-0.43</td>
</tr>
<tr>
<td>Interpersonal NSSI</td>
<td>$T_1$ (baseline)</td>
<td>192</td>
<td>1.82 (0.79)</td>
<td>1.01</td>
<td>0.64</td>
</tr>
<tr>
<td></td>
<td>$T_2$ (3 months)</td>
<td>82</td>
<td>1.65 (0.73)</td>
<td>1.04</td>
<td>0.34</td>
</tr>
<tr>
<td></td>
<td>$T_3$ (6 months)</td>
<td>69</td>
<td>1.64 (0.68)</td>
<td>1.00</td>
<td>0.45</td>
</tr>
<tr>
<td></td>
<td>$T_4$ (9 months)</td>
<td>62</td>
<td>1.78 (0.81)</td>
<td>0.95</td>
<td>0.35</td>
</tr>
<tr>
<td></td>
<td>$T_5$ (12 months)</td>
<td>46</td>
<td>1.71 (0.81)</td>
<td>0.79</td>
<td>-0.81</td>
</tr>
<tr>
<td></td>
<td>$T_6$ (15 months)</td>
<td>26</td>
<td>1.71 (0.74)</td>
<td>0.52</td>
<td>-1.33</td>
</tr>
<tr>
<td></td>
<td>$T_7$ (18 months)</td>
<td>22</td>
<td>1.61 (0.59)</td>
<td>0.52</td>
<td>-0.92</td>
</tr>
<tr>
<td></td>
<td>$T_8$ (21 months)</td>
<td>22</td>
<td>1.74 (0.56)</td>
<td>-0.11</td>
<td>-1.58</td>
</tr>
<tr>
<td></td>
<td>$T_9$ (24 months)</td>
<td>23</td>
<td>1.70 (0.61)</td>
<td>0.43</td>
<td>-1.12</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
<td>----------</td>
<td>----------</td>
<td>----------</td>
<td>----------</td>
<td>----------</td>
</tr>
<tr>
<td></td>
<td>T₁ (baseline)</td>
<td>196</td>
<td>13.66 (4.75)</td>
<td>-0.1</td>
<td>-0.68</td>
</tr>
<tr>
<td></td>
<td>T₂ (3 months)</td>
<td>84</td>
<td>10.79 (4.94)</td>
<td>0.41</td>
<td>-0.77</td>
</tr>
<tr>
<td></td>
<td>T₃ (6 months)</td>
<td>70</td>
<td>9.59 (4.48)</td>
<td>0.51</td>
<td>-0.20</td>
</tr>
<tr>
<td></td>
<td>T₄ (9 months)</td>
<td>62</td>
<td>10.18 (4.48)</td>
<td>0.52</td>
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<tr>
<td>Time Period</td>
<td>Sample Size</td>
<td>Interpersonal Sensitivity</td>
<td>Anxiety</td>
<td></td>
<td></td>
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<td>---------</td>
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<td>T₃ (6 months)</td>
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<td>3.99 (1.50)</td>
<td>-0.80</td>
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<tr>
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<td>3.98 (1.53)</td>
<td>-0.39</td>
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<td>4.12 (1.50)</td>
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<td></td>
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<tr>
<td>T₉ (24 months)</td>
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<td>4.35 (1.24)</td>
<td>-0.83</td>
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Interpersonal Sensitivity

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<th>Anxiety</th>
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</thead>
<tbody>
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<td>2.51 (1.02)</td>
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</tr>
<tr>
<td>T₂ (3 months)</td>
<td>86</td>
<td>2.29 (1.12)</td>
<td>-0.25</td>
</tr>
<tr>
<td>T₃ (6 months)</td>
<td>71</td>
<td>2.27 (0.98)</td>
<td>-0.33</td>
</tr>
<tr>
<td>T₄ (9 months)</td>
<td>62</td>
<td>2.32 (1.09)</td>
<td>-0.30</td>
</tr>
<tr>
<td>T₅ (12 months)</td>
<td>48</td>
<td>2.03 (1.26)</td>
<td>-0.26</td>
</tr>
<tr>
<td>T₆ (15 months)</td>
<td>28</td>
<td>2.09 (1.21)</td>
<td>-0.17</td>
</tr>
<tr>
<td>T₇ (18 months)</td>
<td>24</td>
<td>2.14 (1.24)</td>
<td>0.01</td>
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<tr>
<td>T₈ (21 months)</td>
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<td>2.42 (1.21)</td>
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</tr>
<tr>
<td>T₉ (24 months)</td>
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Anxiety

<table>
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<th>Anxiety</th>
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<td>2.02 (1.03)</td>
<td>0.24</td>
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<tr>
<td>T₂ (3 months)</td>
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<td>1.69 (1.01)</td>
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<td>T₃ (6 months)</td>
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<td>1.63 (0.89)</td>
<td>0.11</td>
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<td>1.70 (0.97)</td>
<td>0.08</td>
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<tr>
<td>T (months)</td>
<td>Count</td>
<td>Mean (SD)</td>
<td>Variance</td>
</tr>
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<td>-------</td>
<td>-----------</td>
<td>----------</td>
</tr>
<tr>
<td>5</td>
<td>48</td>
<td>1.58 (1.09)</td>
<td>0.43</td>
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<tr>
<td>6</td>
<td>28</td>
<td>1.79 (1.05)</td>
<td>0.20</td>
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<td>7</td>
<td>24</td>
<td>1.80 (1.14)</td>
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<td>8</td>
<td>24</td>
<td>1.78 (1.13)</td>
<td>-0.06</td>
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<td>9</td>
<td>24</td>
<td>1.78 (1.04)</td>
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<table>
<thead>
<tr>
<th>Phobic Anxiety</th>
<th>T (baseline)</th>
<th>Count</th>
<th>Mean (SD)</th>
<th>Variance</th>
<th>Minimum</th>
<th>Maximum</th>
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<tbody>
<tr>
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<td>1.65 (1.08)</td>
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<td>-0.99</td>
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<tr>
<td>T2</td>
<td>86</td>
<td>1.29 (1.01)</td>
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<td>-0.62</td>
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<td>T3</td>
<td>71</td>
<td>1.27 (0.93)</td>
<td>0.73</td>
<td>-0.21</td>
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<td>T4</td>
<td>62</td>
<td>1.40 (0.99)</td>
<td>0.53</td>
<td>-0.59</td>
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<tr>
<td>T5 (12 months)</td>
<td>48</td>
<td>1.16 (0.98)</td>
<td>0.99</td>
<td>0.59</td>
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<tr>
<td>T6 (15 months)</td>
<td>28</td>
<td>1.19 (1.12)</td>
<td>0.77</td>
<td>-0.81</td>
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<td>-1.48</td>
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<td>T9 (24 months)</td>
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<td>1.49 (1.04)</td>
<td>0.05</td>
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\(^a\) Values refer to untransformed data; intrapersonal NSSI expectations were subsequently dichotomized.
Table 5

*Fixed Effects of Intrapersonal NSSI Expectations Regressed on Clinical Correlates*

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Predictors</th>
<th>Coefficient</th>
<th>SE</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intrapersonal NSSI&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Intercept</td>
<td>3.36</td>
<td>0.05</td>
<td>61.68</td>
<td>&lt; .001</td>
</tr>
<tr>
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<td>0.01</td>
<td>-1.31</td>
<td>.19</td>
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<td>0.00</td>
<td>0.80</td>
<td>.42</td>
</tr>
<tr>
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<td>Suicidality&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.10</td>
<td>0.03</td>
<td>3.07</td>
<td>.002</td>
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<td>Depression&lt;sup&gt;c&lt;/sup&gt;</td>
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<td>0.03</td>
<td>4.07</td>
<td>&lt; .001</td>
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<td>Intrapersonal NSSI&lt;sub&gt;1&lt;/sub&gt;&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Intercept</td>
<td>1.10</td>
<td>0.17</td>
<td>6.49</td>
<td>&lt; .001</td>
</tr>
<tr>
<td></td>
<td>Time&lt;sub&gt;1&lt;/sub&gt;</td>
<td>0.02</td>
<td>0.01</td>
<td>1.42</td>
<td>.16</td>
</tr>
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<td></td>
<td>Time&lt;sub&gt;1&lt;/sub&gt;&lt;sup&gt;2&lt;/sup&gt;</td>
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<td>.25</td>
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<td>0.05</td>
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<td>0.04</td>
<td>-0.04</td>
<td>.97</td>
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<td>0.07</td>
<td>0.04</td>
<td>2.04</td>
<td>.04</td>
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<sup>a</sup>df = 337.  <sup>b</sup>df = 175.  <sup>c</sup>Standardized predictor in SD units.
### Table 6

*Fixed Effects of Interpersonal NSSI Expectations Regressed on Clinical Correlates*

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Predictor</th>
<th>Coefficient (log-odds)</th>
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<th>OR</th>
<th>z</th>
<th>p</th>
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<td>0.56</td>
<td>2.46</td>
<td>.01</td>
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<td>.04</td>
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<td>-0.15</td>
<td>0.18</td>
<td>0.86</td>
<td>-0.81</td>
<td>.42</td>
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<tr>
<td>Interpersonal NSSI&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Intercept</td>
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<td>0.76</td>
<td>0.06</td>
<td>-3.74</td>
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<td>.22</td>
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<td>Interpersonal NSSI&lt;sub&gt;(t-1)&lt;/sub&gt;&lt;sup&gt;c&lt;/sup&gt;</td>
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<td>0.75</td>
<td>3.93</td>
<td>1.84</td>
<td>.07</td>
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<td>0.34</td>
<td>1.11</td>
<td>0.32</td>
<td>.75</td>
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<tr>
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<td>0.01</td>
<td>.99</td>
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<td>0.28</td>
<td>1.27</td>
<td>0.84</td>
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</table>

*Note.* OR = odds ratio.

<sup>a</sup>df = 334.  <sup>b</sup>df = 175.  <sup>c</sup>Standardized predictor in SD units
## Table 7

### Correlation Matrix of Intrapersonal and Interpersonal NSSI Expectations, Suicidality, Depressive Symptoms

| RA1   | RE1   | SU1   | DE1   | RA2   | RE2   | SU2   | DE2   | RA3   | RE3   | SU3   | DE3   | RA4   | RE4   | SU4   | DE4   | RA5   | RE5   | SU5   | DE5   | RA6   | RE6   | SU6   | DE6   | RA7   | RE7   | SU7   | DE7   | RA8   | RE8   | SU8   | DE8   | RA9   | RE9   | SU9   | DE9   |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1     | -0.01 | 0.31  | 0.14  | 0.46  | 1     | 0.68  | 0.13  | 0.26  | 0.41  | 1     | 0.08  | 0.61  | 0.17  | 0.16  | 0.21  | 1     | 0.29  | 0.21  | 0.68  | 0.41  | 0.30  | 1     | 0.25  | 0.20  | 0.43  | 0.51  | 0.37  | 0.41  | 0.73  | 1     | 0.64  | 0.03  | 0.34  | 0.42  | 0.73  | 0.18  | 0.31  | 0.39  | 1     |
|       |       | 0.31  | 0.08  | 1     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | -0.01 | 0.36  | 0.46  | 1     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       |       | 0.31  | 0.08  | 1     | 0.08  | 0.61  | 0.17  | 0.16  | 0.21  | 1     | 0.29  | 0.21  | 0.68  | 0.41  | 0.30  | 1     | 0.25  | 0.20  | 0.43  | 0.51  | 0.37  | 0.41  | 0.73  | 1     | 0.64  | 0.03  | 0.34  | 0.42  | 0.73  | 0.18  | 0.31  | 0.39  | 1     |
|       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |

**Note.** Numeral refers to timepoint. RA = Intrapersonal NSSI, RE = Interpersonal NSSI, SU = Suicidality, DE = Depressive Symptoms.
Table 8

*Fixed Effects of Intrapersonal NSSI Expectations Regressed on Clinical Correlates, Exploratory Model*

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Predictors</th>
<th>Coefficient</th>
<th>SE</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intrapersonal NSSI&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Intercept</td>
<td>3.38</td>
<td>0.05</td>
<td>66.87</td>
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</tr>
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<td>0.01</td>
<td>-2.77</td>
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</tr>
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<td>Time&lt;sup&gt;2&lt;/sup&gt;</td>
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<td>0.00</td>
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<td>0.03</td>
<td>3.26</td>
<td>.001</td>
</tr>
<tr>
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<td>Depression&lt;sup&gt;c&lt;/sup&gt;</td>
<td>-0.01</td>
<td>0.04</td>
<td>-0.32</td>
<td>.75</td>
</tr>
<tr>
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<td>Interpersonal Sensitivity&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.04</td>
<td>0.03</td>
<td>1.19</td>
<td>.23</td>
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<tr>
<td></td>
<td>Anxiety&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.08</td>
<td>0.03</td>
<td>2.35</td>
<td>.02</td>
</tr>
<tr>
<td></td>
<td>Phobic Anxiety&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.12</td>
<td>0.04</td>
<td>3.47</td>
<td>&lt; .001</td>
</tr>
</tbody>
</table>

| Intrapersonal NSSI<sup>b</sup> | Intercept | 1.24 | 0.18 | 6.92  | < .001 |
| Time<sup>t</sup> | 0.02 | 0.01 | 1.50 | .13  |
| Time<sup>t</sup><sup>2</sup> | -0.01 | 0.01 | -1.15 | .25  |
| Intrapersonal NSSI<sub>(t-1)</sub><sup>c</sup> | 0.64 | 0.05 | 12.49 | < .001 |
| Suicidality<sub>(t-1)</sub><sup>c</sup> | 0.01 | 0.04 | 0.33 | .75  |
| Depression<sub>(t-1)</sub><sup>c</sup> | 0.00 | 0.05 | 0.10 | .92  |
| Interpersonal Sensitivity<sub>(t-1)</sub><sup>c</sup> | 0.06 | 0.04 | 1.52 | .13  |
| Anxiety<sub>(t-1)</sub><sup>c</sup> | 0.00 | 0.04 | 0.05 | .96  |
| Phobic Anxiety<sub>(t-1)</sub><sup>c</sup> | 0.05 | 0.04 | 1.28 | .20  |

<sup>a</sup>df = 334. <sup>b</sup>df = 172. <sup>c</sup>Standardized predictor in SD units.
Table 9

*Fixed Effects of Interpersonal NSSI Expectations Regressed on Clinical Correlates, Exploratory Model*

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Predictor</th>
<th>Coefficient (log-odds)</th>
<th>SE</th>
<th>OR</th>
<th>z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interpersonal NSSI&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Intercept</td>
<td>-3.44</td>
<td>0.88</td>
<td>0.03</td>
<td>-3.92</td>
<td>&lt; .001</td>
</tr>
<tr>
<td></td>
<td>Time</td>
<td>-0.56</td>
<td>0.23</td>
<td>0.57</td>
<td>-2.42</td>
<td>.02</td>
</tr>
<tr>
<td></td>
<td>Suicidality&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.20</td>
<td>0.22</td>
<td>1.23</td>
<td>0.92</td>
<td>.36</td>
</tr>
<tr>
<td></td>
<td>Depression&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.61</td>
<td>0.30</td>
<td>1.85</td>
<td>2.06</td>
<td>.04</td>
</tr>
<tr>
<td></td>
<td>Social Support&lt;sup&gt;c&lt;/sup&gt;</td>
<td>-0.16</td>
<td>0.18</td>
<td>0.86</td>
<td>-0.86</td>
<td>.39</td>
</tr>
<tr>
<td></td>
<td>Interpersonal Sensitivity&lt;sup&gt;c&lt;/sup&gt;</td>
<td>-0.04</td>
<td>0.27</td>
<td>0.96</td>
<td>-0.15</td>
<td>.88</td>
</tr>
<tr>
<td></td>
<td>Anxiety&lt;sup&gt;c&lt;/sup&gt;</td>
<td>-0.34</td>
<td>0.26</td>
<td>0.71</td>
<td>-1.27</td>
<td>.20</td>
</tr>
<tr>
<td></td>
<td>Phobic Anxiety&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.16</td>
<td>0.26</td>
<td>1.18</td>
<td>0.63</td>
<td>.53</td>
</tr>
<tr>
<td>Interpersonal NSSI&lt;sub&gt;t&lt;/sub&gt;&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Intercept</td>
<td>-2.68</td>
<td>0.49</td>
<td>0.07</td>
<td>-5.52</td>
<td>&lt; .001</td>
</tr>
<tr>
<td></td>
<td>Time&lt;sub&gt;t&lt;/sub&gt;</td>
<td>-0.15</td>
<td>0.12</td>
<td>0.86</td>
<td>-1.26</td>
<td>.21</td>
</tr>
<tr>
<td></td>
<td>Interpersonal NSSI&lt;sub&gt;(t-1)&lt;/sub&gt;&lt;sup&gt;c&lt;/sup&gt;</td>
<td>1.92</td>
<td>0.60</td>
<td>6.86</td>
<td>3.19</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>Suicidality&lt;sub&gt;(t-1)&lt;/sub&gt;&lt;sup&gt;c&lt;/sup&gt;</td>
<td>-0.02</td>
<td>0.33</td>
<td>0.98</td>
<td>-0.05</td>
<td>.96</td>
</tr>
<tr>
<td></td>
<td>Depression&lt;sub&gt;(t-1)&lt;/sub&gt;&lt;sup&gt;c&lt;/sup&gt;</td>
<td>-0.16</td>
<td>0.34</td>
<td>0.85</td>
<td>-0.47</td>
<td>.64</td>
</tr>
<tr>
<td></td>
<td>Social Support&lt;sub&gt;(t-1)&lt;/sub&gt;&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.11</td>
<td>0.26</td>
<td>1.12</td>
<td>0.43</td>
<td>.66</td>
</tr>
<tr>
<td></td>
<td>Interpersonal Sensitivity&lt;sub&gt;(t-1)&lt;/sub&gt;&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.73</td>
<td>0.34</td>
<td>2.07</td>
<td>2.14</td>
<td>.03</td>
</tr>
<tr>
<td></td>
<td>Anxiety&lt;sub&gt;(t-1)&lt;/sub&gt;&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.02</td>
<td>0.34</td>
<td>1.02</td>
<td>0.04</td>
<td>.96</td>
</tr>
<tr>
<td></td>
<td>Phobic Anxiety&lt;sub&gt;(t-1)&lt;/sub&gt;&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.21</td>
<td>0.36</td>
<td>1.24</td>
<td>0.60</td>
<td>.55</td>
</tr>
</tbody>
</table>

*Note. OR = odds ratio.*

<sup>a</sup> df = 334. <sup>b</sup>df = 175. <sup>c</sup>Standardized predictor in SD units.
Table 10
Comparison of Sample-sizes, n, between Primary and Secondary Analyses of Aim 2
(Appendix B)

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Timepoint(s)</th>
<th>Conservative n (Results - Aim 2)</th>
<th>Functional n (Appendix B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross-sectional (2ai, 2a(ii)</td>
<td>1</td>
<td>190</td>
<td>339</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>82</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>69</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>62</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>Longitudinal (2bi, 2bii)</td>
<td>1,2</td>
<td>82</td>
<td>181</td>
</tr>
<tr>
<td></td>
<td>2,3</td>
<td>56</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3,4</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4,5</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5,6</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6,7</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7,8</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8,9</td>
<td>16</td>
<td></td>
</tr>
</tbody>
</table>
Appendix B – Alternative Analysis of Aim 2

An alternative to the two-stage asymptotically distribution-free procedure used in the current study is a two-stage generalized least-squares approach (Steiger, 1980) with a larger functional sample size. In this approach, tests use the $n$ from the parallel multilevel analyses conducted in Aim 1, adjusting for independence among rows. This procedure assumes multivariate normality. Data were multivariate normal across timepoints, with the exception of Hypothesis 2a tests at baseline and at 21-month follow up, which exhibited multivariate skewness, $ps < .05$.

Hypothesis 2ai was that suicidality was more strongly associated with intrapersonal NSSI expectations than interpersonal NSSI expectations cross-sectionally (Table 10). Hypothesis 2a(ii) was that depressive symptoms were more strongly associated with intrapersonal NSSI expectations than interpersonal NSSI expectations cross-sectionally. Omnibus tests of correlation patterns at each timepoint indicated differences between correlations involving intrapersonal NSSI expectations and interpersonal NSSI expectations at baseline, $\chi^2 (2, N = 339) = 13.25, p < .01$, at 6-month follow-up $\chi^2 (2, N = 339) = 20.12, p < .001$, 9-month follow-up, $\chi^2 (2, N = 339) = 26.31, p < .001$, 1-year follow-up, $\chi^2 (2, N = 339) = 32.70, p < .001$, 15-month follow-up, $\chi^2 (2, N = 339) = 13.84, p < .01$, 18-month follow-up, $\chi^2 (2, N = 339) = 8.77, p < .05$, and 21-month follow-up, $\chi^2 (2, N = 339) = 26.66, p < .001$. Differences at 3-month follow-up and 2-year follow-up were non-significant, $ps > .05$. Focal probes of significant omnibus tests indicated that the magnitude of the correlation between suicidality and intrapersonal NSSI expectations was greater than the correlation between suicidality and interpersonal NSSI expectations at baseline, $\chi^2 (1, N = 339) = 9.65, p < .01$, 6-
month follow-up, $\chi^2 (1, N = 339) = 15.41, p < .001$, 9-month follow-up, $\chi^2 (1, N = 339) = 14.00, p < .001$, 1-year follow-up, $\chi^2 (1, N = 339) = 17.52, p < .001$, 15-month follow-up, $\chi^2 (1, N = 339) = 3.96, p < .05$, 18-month follow-up, $\chi^2 (1, N = 339) = 7.65, p < .01$, and 21-month follow-up, $\chi^2 (1, N = 339) = 19.98, p < .001$. Similarly, the correlation between depressive symptoms and intrapersonal NSSI expectations was greater than the correlation between depressive symptoms and interpersonal NSSI expectations at baseline, $\chi^2 (1, N = 339) = 9.08, p < .01$, 6-month follow-up, $\chi^2 (1, N = 339) = 14.42, p < .001$, 9-month follow-up, $\chi^2 (1, N = 339) = 20.54, p < .001$, 1-year follow up $\chi^2 (1, N = 339) = 30.03, p < .001$, and 15-month follow-up, $\chi^2 (1, N = 339) = 12.92, p < .001$.

Altogether, seven of nine tests for Hypothesis 2ai and five of nine tests for Hypothesis 2aii were significant, suggesting that participant attrition may have impacted the results of primary analyses using conservative sample sizes.

Hypothesis 2bi was that suicidality at each time point was more strongly associated with intrapersonal NSSI expectations at the next time point (i.e., 3 months later) than with interpersonal NSSI expectations at the next time point. Hypothesis 2bi was that depressive symptoms at each time point were more strongly associated with intrapersonal NSSI expectations at the next time point than with interpersonal NSSI expectations at the next time point. Omnibus tests of correlation patterns across each pair of neighbouring timepoints indicated differences between clinical variables predicting intrapersonal NSSI expectations compared to interpersonal NSSI expectations from baseline to 3-month follow-up, $\chi^2 (2, N = 181) = 7.70, p < .05$, 6-month follow-up to 9-month follow-up, $\chi^2 (2, N = 181) = 26.85, p < .001$, from 9-month follow-up to 1-year follow-up $\chi^2 (2, N = 181) = 37.13, p < .001$, from 1-year follow-up to
15-month follow-up, $\chi^2 (2, N = 181) = 73.3, p < .001$, from 15-month follow-up to 18-month follow-up, $\chi^2 (2, N = 181) = 11.81, p < .01$, and from 18-month follow-up to 21-month follow-up, $\chi^2 (2, N = 181) = 56.99, p < .001$. Differences from 3-month follow-up to 6-month follow up, as well as from 21-month follow-up to 2-year follow-up were non-significant, $ps > .05$. Focal probes of significant omnibus tests indicated that the correlation of suicidality predicting intrapersonal NSSI expectations was greater than the correlation between suicidality predicting interpersonal NSSI expectations from 6-month follow-up to 9-month follow-up, $\chi^2 (1, N = 181) = 21.74, p < .001$, from 9-month follow-up to 1-year follow-up, $\chi^2 (1, N = 181) = 26.04, p < .001$, from 1-year follow-up to 15-month follow-up, $\chi^2 (1, N = 181) = 24.11, p < .001$, and from 18-month follow-up to 21-month follow-up, $\chi^2 (1, N = 181) = 56.37, p < .001$. The correlation of depressive symptoms predicting intrapersonal NSSI expectations was also greater than the correlation of depressive symptoms predicting interpersonal NSSI expectations from baseline to 3-month follow-up, $\chi^2 (1, N = 181) = 7.66, p < .01$, from 6-month follow-up to 9-month follow-up, $\chi^2 (1, N = 181) = 18.43, p < .001$, from 9-month follow-up to 1-year follow-up, $\chi^2 (1, N = 181) = 23.91, p < .001$, from 1-year follow-up to 15-month follow-up, $\chi^2 (1, N = 181) = 10.41, p < .01$, and from 18-month follow-up to 21-month follow-up, $\chi^2 (1, N = 181) = 36.68, p < .001$. Altogether, four of nine tests for Hypothesis 2bi and five of nine tests for Hypothesis 2bii were significant, indicating participant attrition in primary analyses may be impacting results and underscoring the need to replicate with larger samples to clarify these inconsistent analyses.
Appendix C – R Script

```r
#load foreign
library(foreign)

#load multilevel
library(nlme)

#load lme4
library(lme4)

#load tidyverse
library(tidyverse)

#load ggplot
library(ggplot2)

#read in data
facebook.long=read.spss(file.choose())
facebook.long=data.frame(facebook.long)

#filter age and NA
facebook.long=facebook.long[facebook.long$age>15,]
facebook.long=facebook.long[complete.cases(facebook.long$age),]
facebook.long$NSSI_INTRA[facebook.long$NSSI_INTRA==0]= NA
facebook.long$NSSI_INTER[facebook.long$NSSI_INTER==0]= NA

#compute mean-centred within Timepoint variables
facebook.long <- facebook.long %>%
  select(id,Timepoint,age,NSSI_INTRA,NSSI_INTER,SBQTot,bsiint:bsiphob,sspSat) %>%
  group_by(Timepoint) %>%
  mutate(count = n()) %>%
  mutate(Ct.NSSI_INTRA = NSSI_INTRA - mean(NSSI_INTRA,na.rm=TRUE)) %>%
  mutate(Ct.NSSI_INTER = NSSI_INTER - mean(NSSI_INTER,na.rm=TRUE)) %>%
  mutate(Ct.SBQTot = SBQTot - mean(SBQTot,na.rm=TRUE)) %>%
  mutate(Ct.bsidep = bsidep - mean(bsidep,na.rm=TRUE)) %>%
  ungroup()

#compute lag variables
facebook.long = facebook.long %>%
  mutate(NSSI_INTRA = dplyr::lag(NSSI_INTRA,n=1,default=NA)) %>%
  mutate(NSSI_INTER = dplyr::lag(NSSI_INTER,n=1,default=NA)) %>%
  mutate(SBQTotlag = dplyr::lag(SBQTot,n=1,default=NA)) %>%
  mutate(bsideplag = dplyr::lag(bsidep,n=1,default=NA)) %>%
  mutate(sspSatlag = dplyr::lag(sspSat,n=1,default=NA)) %>%
  mutate(bsiintlag = dplyr::lag(bsiint,n=1,default=NA)) %>%
  mutate(bsianxlag = dplyr::lag(bsianx,n=1,default=NA)) %>%
  ungroup()
```

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mutate(bsiphoblag = dplyr::lag(bsiphob,n=1,default=NA))

#Dichotomize INTER
facebook.long$NSSI_INTER.D = ifelse(facebook.long$NSSI_INTER>2,1,0)
facebook.long$NSSI_INTER.Dlag = ifelse(facebook.long$NSSI_INTERlag>2,1,0)

#Centre Timepoint
facebook.long$C.Timepoint = scale(facebook.long$Timepoint, scale = FALSE)

#Unconditional growth
model.intra.growth=lme(NSSI_INTRA~C.Timepoint+I(C.Timepoint^2),
                         random=~C.Timepoint+I(C.Timepoint^2)|id,data=facebook.long,
                         na.action=na.omit,control=list(maxIter="1000",msMaxIter="1000",opt="optim"),
                         method="ML")
intervals(model.intra.growth)
summary(model.intra.growth)

model.inter.growth=glmer(NSSI_INTER.D~C.Timepoint+(C.Timepoint|id),data=facebook.long,
                          family=binomial,control=glmerControl(optimizer="bobyqa"))
summary(model.inter.growth)

graph.intra.growth = ggplot(data = facebook.long, mapping=aes(x = C.Timepoint, y = NSSI_INTRA)) +
  geom_point(size=.1,color="red") +
  geom_smooth(method=lm, formula=y~poly(x,2),se=FALSE,color="black") +
  annotate("text", x = c(0), y=c(1.5), label = c("Y=3.41+0.61X^2"),color="black") +
  xlim(-4,4) +
  labs(x = "Timepoint", y = "Intrapersonal NSSI",
       title="Quadratic relationship of intrapersonal NSSI expectations over time",
       subtitle="Time mean-centred") +
  theme_classic()

graph.inter.growth = ggplot(data = facebook.long, mapping=aes(x = Timepoint, y = exp(NSSI_INTER.D))) +
  geom_point(alpha=0.05) +
  geom_smooth(method=lm, formula=y~x,se=FALSE) +
  theme_classic()

#INTRA Omnibus cross-sectional
model.intra.sbqdep=lme(NSSI_INTRA~C.Timepoint+I(C.Timepoint^2)+scale(SBQTot)+scale(bsidep),
                         random=~C.Timepoint+I(C.Timepoint^2)|id,data=facebook.long,
                         na.action=na.omit,control=list(maxIter="1000",msMaxIter="1000",opt="optim"),
                         method="ML")
summary(model.intra.sbqdep)

#INTRA Omnibus longitudinal
model.intra.sbqdep.lag=lme(NSSI_INTRA~C.Timepoint+I(C.Timepoint^2)+NSSI_INTRAlag+scale(SBQTotlag)+scale(bsideplag),
                           random=~C.Timepoint+I(C.Timepoint^2)|id,data=facebook.long,na.action=na.omit,
                           control=list(maxIter="1000",msMaxIter="1000",maxIter="1000",msMaxIter="1000",opt="optim"),
                           method="ML")
summary(model.intra.sbqdep.lag)

#INTRA Exploratory Omnibus cross-sectional
model.intra.all=lme(NSSI_INTRA~C.Timepoint+I(C.Timepoint^2)+scale(SBQTot)+scale(bsidep)+scale(bsiint)+scale(bsianx)+scale(bsiphob),
random=~C.Timepoint+I(C.Timepoint^2)|id,data=facebook.long,na.action=na.omit,
control=list(maxIter="1000",msMaxIter="1000",opt="optim"),method="ML")
summary(model.intra.all)

#INTRA Exploratory Omnibus longitudinal
model.intra.all.lag=lme(NSSI_INTRA~C.Timepoint+I(C.Timepoint^2)+NSSI_INTRAlag+scale(SBQTotlag) +scale(bsideplag)+scale(bsiintlag)+scale(bsianxlag)+scale(bsiphoblag),
random=~C.Timepoint+I(C.Timepoint^2)|id,data=facebook.long,na.action=na.omit,
control=list(maxIter="1000",msMaxIter="1000",maxIter="1000",msMaxIter="1000",opt="optim"),method="ML")
summary(model.intra.all.lag)

#INTER Omnibus logistic cross-sectional
model.inter.sbqdepSat=glmer(NSSI_INTER.D~C.Timepoint+scale(SBQTot)+scale(bsidep)+scale(sspSat) +(C.Timepoint|id),data=facebook.long,family=binomial,control=glmerControl(optimizer="bobyqa"))
summary(model.inter.sbqdepSat)
exp(fixef(model.inter.sbqdepSat))

#INTER Omnibus logistic longitudinal
model.inter.sbqdepSat.lag=glmer(NSSI_INTER.D~C.Timepoint+NSSI_INTER.Dlag+scale(SBQTotlag)+scale(bsideplag)+scale(sspSatlag)+(1|id),
data=facebook.long,family=binomial,control=glmerControl(optimizer="bobyqa"))
summary(model.inter.sbqdepSat.lag)
exp(fixef(model.inter.sbqdepSat.lag))

#INTER Exploratory Omnibus logistic cross-sectional
model.inter.all=glmer(NSSI_INTER.D~C.Timepoint+scale(SBQTot)+scale(bsidep)+scale(sspSat)+scale(bsiint)+scale(bsianx)+scale(bsiphob)+(C.Timepoint|id),
data=facebook.long,family=binomial,control=glmerControl(optimizer="bobyqa"))
summary(model.inter.all)
exp(fixef(model.inter.all))

#INTER Exploratory Omnibus logistic longitudinal
model.inter.all.lag=glmer(NSSI_INTER.D~C.Timepoint+NSSI_INTER.Dlag+scale(SBQTotlag)+scale(bsideplag)+scale(sspSatlag)+scale(bsiint)+scale(bsianx)+scale(bsiphob)+(1|id),
data=facebook.long,family=binomial,control=glmerControl(optimizer="bobyqa"))
summary(model.inter.all.lag)
exp(fixef(model.inter.all.lag))

#WBCORR Raw Data
write_csv(drop_na(as_tibble(cbind(facebook.long$Ct.NSSI_INTRA[facebook.long$Timepoint==0],
facebook.long$Ct.NSSI_INTER[facebook.long$Timepoint==0],
facebook.long$Ct.SBQTot[facebook.long$Timepoint==0],
facebook.long$Ct.bsidep[facebook.long$Timepoint==0]),
validate = FALSE)),"C:/Users/butle/Documents/SPSS/INTRAINTERSBQbsiT0Raw.csv",
col_names = FALSE)
temp <- rcorr(cbind(facebook.long$Ct.NSSI_INTRA[facebook.long$Timepoint==0],
facebook.long$Ct.NSSI_INTER[facebook.long$Timepoint==0],
facebook.long$Ct.SBQTot[facebook.long$Timepoint==0],
facebook.long$Ct.bsidep[facebook.long$Timepoint==0]))
write_csv(as_tibble(temp$r),"C:/Users/butle/Documents/SPSS/INTRAINTERSBQbsiT0Matrix.csv",
col_names = FALSE)
write_csv(drop_na(as_tibble(cbind(facebook.long$Ct.NSSI_INTRA[facebook.long$Timepoint==1],
    facebook.long$Ct.NSSI_INTER[facebook.long$Timepoint==1],
    facebook.long$Ct.SBQTot[facebook.long$Timepoint==1],
    facebook.long$Ct.bsidep[facebook.long$Timepoint==1]),
    validate = FALSE)),"C:/Users/butle/Documents/SPSS/INTRAINTERSBQbsiT1Raw.csv",
  col_names = FALSE)
temp <- rcorr(cbind(facebook.long$Ct.NSSI_INTRA[facebook.long$Timepoint==1],
    facebook.long$Ct.NSSI_INTER[facebook.long$Timepoint==1],
    facebook.long$Ct.SBQTot[facebook.long$Timepoint==1],
    facebook.long$Ct.bsidep[facebook.long$Timepoint==1]))
write_csv(as_tibble(temp$r),"C:/Users/butle/Documents/SPSS/INTRAINTERSBQbsiT1Matrix.csv",
  col_names = FALSE)
write_csv(drop_na(as_tibble(cbind(facebook.long$Ct.NSSI_INTRA[facebook.long$Timepoint==2],
    facebook.long$Ct.NSSI_INTER[facebook.long$Timepoint==2],
    facebook.long$Ct.SBQTot[facebook.long$Timepoint==2],
    facebook.long$Ct.bsidep[facebook.long$Timepoint==2]),
    validate = FALSE)),"C:/Users/butle/Documents/SPSS/INTRAINTERSBQbsiT2Raw.csv",
  col_names = FALSE)
temp <- rcorr(cbind(facebook.long$Ct.NSSI_INTRA[facebook.long$Timepoint==2],
    facebook.long$Ct.NSSI_INTER[facebook.long$Timepoint==2],
    facebook.long$Ct.SBQTot[facebook.long$Timepoint==2],
    facebook.long$Ct.bsidep[facebook.long$Timepoint==2]))
write_csv(as_tibble(temp$r),"C:/Users/butle/Documents/SPSS/INTRAINTERSBQbsiT2Matrix.csv",
  col_names = FALSE)
write_csv(drop_na(as_tibble(cbind(facebook.long$Ct.NSSI_INTRA[facebook.long$Timepoint==3],
    facebook.long$Ct.NSSI_INTER[facebook.long$Timepoint==3],
    facebook.long$Ct.SBQTot[facebook.long$Timepoint==3],
    facebook.long$Ct.bsidep[facebook.long$Timepoint==3]),
    validate = FALSE)),"C:/Users/butle/Documents/SPSS/INTRAINTERSBQbsiT3Raw.csv",
  col_names = FALSE)
temp <- rcorr(cbind(facebook.long$Ct.NSSI_INTRA[facebook.long$Timepoint==3],
    facebook.long$Ct.NSSI_INTER[facebook.long$Timepoint==3],
    facebook.long$Ct.SBQTot[facebook.long$Timepoint==3],
    facebook.long$Ct.bsidep[facebook.long$Timepoint==3]))
write_csv(as_tibble(temp$r),"C:/Users/butle/Documents/SPSS/INTRAINTERSBQbsiT3Matrix.csv",
  col_names = FALSE)
write_csv(drop_na(as_tibble(cbind(facebook.long$Ct.NSSI_INTRA[facebook.long$Timepoint==4],
    facebook.long$Ct.NSSI_INTER[facebook.long$Timepoint==4],
    facebook.long$Ct.SBQTot[facebook.long$Timepoint==4],
    facebook.long$Ct.bsidep[facebook.long$Timepoint==4]),
    validate = FALSE)),"C:/Users/butle/Documents/SPSS/INTRAINTERSBQbsiT4Raw.csv",
  col_names = FALSE)
temp <- rcorr(cbind(facebook.long$Ct.NSSI_INTRA[facebook.long$Timepoint==4],
    facebook.long$Ct.NSSI_INTER[facebook.long$Timepoint==4],
    facebook.long$Ct.SBQTot[facebook.long$Timepoint==4],
    facebook.long$Ct.bsidep[facebook.long$Timepoint==4]))
write_csv(as_tibble(temp$r),"C:/Users/butle/Documents/SPSS/INTRAINTERSBQbsiT4Matrix.csv",
  col_names = FALSE)
write_csv(drop_na(as_tibble(cbind(facebook.long$Ct.NSSI_INTRA[facebook.long$Timepoint==5],
    facebook.long$Ct.NSSI_INTER[facebook.long$Timepoint==5],
    facebook.long$Ct.SBQTot[facebook.long$Timepoint==5],
    facebook.long$Ct.bsidep[facebook.long$Timepoint==5]),
    validate = FALSE)),"C:/Users/butle/Documents/SPSS/INTRAINTERSBQbsiT5Raw.csv",
  col_names = FALSE)
temp <- rcorr(cbind(facebook.long$Ct.NSSI_INTRA[facebook.long$Timepoint==5],
    facebook.long$Ct.NSSI_INTER[facebook.long$Timepoint==5],
    facebook.long$Ct.SBQTot[facebook.long$Timepoint==5],
    facebook.long$Ct.bsidep[facebook.long$Timepoint==5]))
write_csv(as_tibble(temp$r),"C:/Users/butle/Documents/SPSS/INTRAINTERSBQbsiT5Matrix.csv",
    col_names = FALSE)
write_csv(drop_na(as_tibble(cbind(facebook.long$Ct.NSSI_INTRA[facebook.long$Timepoint==6],
    facebook.long$Ct.NSSI_INTER[facebook.long$Timepoint==6],
    facebook.long$Ct.SBQTot[facebook.long$Timepoint==6],
    facebook.long$Ct.bsidep[facebook.long$Timepoint==6]),
    validate = FALSE)),"C:/Users/butle/Documents/SPSS/INTRAINTERSBQbsiT6Matrix.csv",
    col_names = FALSE)
write_csv(drop_na(as_tibble(cbind(facebook.long$Ct.NSSI_INTRA[facebook.long$Timepoint==7],
    facebook.long$Ct.NSSI_INTER[facebook.long$Timepoint==7],
    facebook.long$Ct.SBQTot[facebook.long$Timepoint==7],
    facebook.long$Ct.bsidep[facebook.long$Timepoint==7]),
    validate = FALSE)),"C:/Users/butle/Documents/SPSS/INTRAINTERSBQbsiT7Matrix.csv",
    col_names = FALSE)
write_csv(drop_na(as_tibble(cbind(facebook.long$Ct.NSSI_INTRA[facebook.long$Timepoint==8],
    facebook.long$Ct.NSSI_INTER[facebook.long$Timepoint==8],
    facebook.long$Ct.SBQTot[facebook.long$Timepoint==8],
    facebook.long$Ct.bsidep[facebook.long$Timepoint==8]),
    validate = FALSE)),"C:/Users/butle/Documents/SPSS/INTRAINTERSBQbsiT8Matrix.csv",
    col_names = FALSE)
write_csv(drop_na(as_tibble(cbind(facebook.long$Ct.NSSI_INTRA[facebook.long$Timepoint==0],
    facebook.long$Ct.NSSI_INTER[facebook.long$Timepoint==0],
    facebook.long$Ct.SBQTot[facebook.long$Timepoint==0],
    facebook.long$Ct.bsidep[facebook.long$Timepoint==0]),
    validate = FALSE)),"C:/Users/butle/Documents/SPSS/INTRAINTERSBQbsiT9Matrix.csv",
    col_names = FALSE)
validate = FALSE), "C:/Users/butle/Documents/SPSS/INTRAINTERSBQbsiT1T0LagRaw.csv",
  col_names = FALSE)
temp <- corrcbind(facebook.long$Ct.NSSI_INTRA[facebook.long$Timepoint==1],
  facebook.long$Ct.NSSI_INTER[facebook.long$Timepoint==1],
  facebook.long$Ct.SBQTot[facebook.long$Timepoint==0],
  facebook.long$Ct.bsidep[facebook.long$Timepoint==0])
write_csv(as_tibble(temp$r), "C:/Users/butle/Documents/SPSS/INTRAINTERSBQbsiT1T0LagMatrix.csv",
  col_names = FALSE)
write_csv(drop_na(as_tibble(cbind(facebook.long$Ct.NSSI_INTRA[facebook.long$Timepoint==2],
  facebook.long$Ct.NSSI_INTER[facebook.long$Timepoint==2],
  facebook.long$Ct.SBQTot[facebook.long$Timepoint==1],
  facebook.long$Ct.bsidep[facebook.long$Timepoint==1]),
  validate = FALSE)), "C:/Users/butle/Documents/SPSS/INTRAINTERSBQbsiT2T1LagRaw.csv",
  col_names = FALSE)
temp <- corrcbind(facebook.long$Ct.NSSI_INTRA[facebook.long$Timepoint==3],
  facebook.long$Ct.NSSI_INTER[facebook.long$Timepoint==3],
  facebook.long$Ct.SBQTot[facebook.long$Timepoint==2],
  facebook.long$Ct.bsidep[facebook.long$Timepoint==2])
write_csv(as_tibble(temp$r), "C:/Users/butle/Documents/SPSS/INTRAINTERSBQbsiT3T2LagMatrix.csv",
  col_names = FALSE)
write_csv(drop_na(as_tibble(cbind(facebook.long$Ct.NSSI_INTRA[facebook.long$Timepoint==4],
  facebook.long$Ct.NSSI_INTER[facebook.long$Timepoint==4],
  facebook.long$Ct.SBQTot[facebook.long$Timepoint==3],
  facebook.long$Ct.bsidep[facebook.long$Timepoint==3]),
  validate = FALSE)), "C:/Users/butle/Documents/SPSS/INTRAINTERSBQbsiT4T3LagRaw.csv",
  col_names = FALSE)
temp <- corrcbind(facebook.long$Ct.NSSI_INTRA[facebook.long$Timepoint==5],
  facebook.long$Ct.NSSI_INTER[facebook.long$Timepoint==5],
  facebook.long$Ct.SBQTot[facebook.long$Timepoint==4],
  facebook.long$Ct.bsidep[facebook.long$Timepoint==4],
  validate = FALSE)),
```r
temp <- rcorr(cbind(facebook.long$Ct.NSSI_INTRA[facebook.long$Timepoint==5],
                facebook.long$Ct.NSSI_INTER[facebook.long$Timepoint==5],
                facebook.long$Ct.SBQTot[facebook.long$Timepoint==4],
                facebook.long$Ct.bsidep[facebook.long$Timepoint==4]))
write_csv(as_tibble(temp$r),"C:/Users/butle/Documents/SPSS/INTRAINTERSBQbsiT5T4LagMatrix.csv",
          col_names = FALSE)
write_csv(drop_na(as_tibble(cbind(facebook.long$Ct.NSSI_INTRA[facebook.long$Timepoint==6],
                               facebook.long$Ct.NSSI_INTER[facebook.long$Timepoint==6],
                               facebook.long$Ct.SBQTot[facebook.long$Timepoint==5],
                               facebook.long$Ct.bsidep[facebook.long$Timepoint==5]),validate = FALSE)),"C:/Users/butle/Documents/SPSS/INTRAINTERSBQbsiT6T5LagMatrix.csv", 
          col_names = FALSE)
write_csv(drop_na(as_tibble(cbind(facebook.long$Ct.NSSI_INTRA[facebook.long$Timepoint==7],
                               facebook.long$Ct.NSSI_INTER[facebook.long$Timepoint==7],
                               facebook.long$Ct.SBQTot[facebook.long$Timepoint==6],
                               facebook.long$Ct.bsidep[facebook.long$Timepoint==6]),validate = FALSE)),"C:/Users/butle/Documents/SPSS/INTRAINTERSBQbsiT7T6LagMatrix.csv", 
          col_names = FALSE)
write_csv(drop_na(as_tibble(cbind(facebook.long$Ct.NSSI_INTRA[facebook.long$Timepoint==8],
                               facebook.long$Ct.NSSI_INTER[facebook.long$Timepoint==8],
                               facebook.long$Ct.SBQTot[facebook.long$Timepoint==7],
                               facebook.long$Ct.bsidep[facebook.long$Timepoint==7]),validate = FALSE)),"C:/Users/butle/Documents/SPSS/INTRAINTERSBQbsiT8T7LagMatrix.csv", 
          col_names = FALSE)
```
facebook.long$Ct.NSSI_INTRA[facebook.long$Timepoint==1],
facebook.long$Ct.NSSI_INTER[facebook.long$Timepoint==1],
facebook.long$Ct.SBQTot[facebook.long$Timepoint==1],
facebook.long$Ct.bsidep[facebook.long$Timepoint==1],
facebook.long$Ct.NSSI_INTRA[facebook.long$Timepoint==2],
facebook.long$Ct.NSSI_INTER[facebook.long$Timepoint==2],
facebook.long$Ct.SBQTot[facebook.long$Timepoint==2],
facebook.long$Ct.bsidep[facebook.long$Timepoint==2],
facebook.long$Ct.NSSI_INTRA[facebook.long$Timepoint==3],
facebook.long$Ct.NSSI_INTER[facebook.long$Timepoint==3],
facebook.long$Ct.SBQTot[facebook.long$Timepoint==3],
facebook.long$Ct.bsidep[facebook.long$Timepoint==3],
facebook.long$Ct.NSSI_INTRA[facebook.long$Timepoint==4],
facebook.long$Ct.NSSI_INTER[facebook.long$Timepoint==4],
facebook.long$Ct.SBQTot[facebook.long$Timepoint==4],
facebook.long$Ct.bsidep[facebook.long$Timepoint==4],
facebook.long$Ct.NSSI_INTRA[facebook.long$Timepoint==5],
facebook.long$Ct.NSSI_INTER[facebook.long$Timepoint==5],
facebook.long$Ct.SBQTot[facebook.long$Timepoint==5],
facebook.long$Ct.bsidep[facebook.long$Timepoint==5],
facebook.long$Ct.NSSI_INTRA[facebook.long$Timepoint==6],
facebook.long$Ct.NSSI_INTER[facebook.long$Timepoint==6],
facebook.long$Ct.SBQTot[facebook.long$Timepoint==6],
facebook.long$Ct.bsidep[facebook.long$Timepoint==6],
facebook.long$Ct.NSSI_INTRA[facebook.long$Timepoint==7],
facebook.long$Ct.NSSI_INTER[facebook.long$Timepoint==7],
facebook.long$Ct.SBQTot[facebook.long$Timepoint==7],
facebook.long$Ct.bsidep[facebook.long$Timepoint==7],
facebook.long$Ct.NSSI_INTRA[facebook.long$Timepoint==8],
facebook.long$Ct.NSSI_INTER[facebook.long$Timepoint==8],
facebook.long$Ct.SBQTot[facebook.long$Timepoint==8],
facebook.long$Ct.bsidep[facebook.long$Timepoint==8])
write_csv(as_tibble(temp$r),"C:/Users/butle/Documents/SPSS/INTRAINTERSBQbsiMasterMatrix.csv",col_names = FALSE)