Attitudes Toward Recovery From Non-Suicidal Self-Injury: Factorial Validity of Two Measures

by

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ABSTRACT

ATTITUDES TOWARD RECOVERY FROM NON-SUICIDAL SELF-INJURY: FACTORIAL VALIDITY OF TWO MEASURES

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Literature suggests that the Trans-theoretical Stages of Change Model (TTM) may be useful in conceptualizing the recovery from non-suicidal self-injury (NSSI), which is often complicated by ambivalence and reluctance to stop NSSI. Accordingly, finding ways to assess attitudes toward NSSI recovery within the TTM may help to tailor NSSI treatment efforts. The Stages of Change Readiness and Treatment Eagerness scale (SOCRATES) and University of Rhode Island Change Assessment (URICA) were adapted to reflect NSSI recovery attitudes, and their factorial validity was examined; literature shows mixed support for the scales' factorial validity. A sample of 351 university students with history of NSSI completed the scales and a series of confirmatory and exploratory factor analyses revealed poor factorial validity of the scales when applied to NSSI recovery. Further research is needed to explore new ways of studying and measuring aspects of the TTM and other recovery-based frameworks when applied to NSSI.
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Introduction

Non-suicidal self-injury (NSSI) is defined as a deliberate and direct destruction of one’s body tissue without conscious suicidal intent (International Society for the Study of Self-Injury, 2007). NSSI represents a paramount mental concern given its prevalence and associations with numerous mental health difficulties (e.g., affect dysregulation, depression), including risk for suicide (Klonsky et al., 2011). Several efforts have been made to provide research-informed guidelines for NSSI treatment, however, the process of NSSI recovery has not received much empirical attention. Recovery from NSSI is viewed as a non-linear process that is often difficult for those who self-injure (e.g., Kress & Hoffman, 2008; Grunberg & Lewis, 2015). Indeed, people may not always be ready to recover and may even have resistance or ambivalence toward recovery (Grunberg & Lewis, 2015). Accordingly, a number of researchers have highlighted that having an understanding of the attitude towards recovery of the individual who engages in self-injury could potentially have empirical and clinical merit (e.g., Kamen, 2009). The current study will attempt to develop and examine the factorial validity of two scales assessing attitudes toward NSSI recovery.

Literature Review

Overview of NSSI

Some of the most common NSSI behaviours include cutting, scraping, carving, banging, bruising, self-hitting, burning, and biting (Klonsky et al., 2011). Although people of all ages may engage in self-injury, most report an age of onset being between 12 and 16 years of age (Nock, 2009). Thus, it is probably of little surprise that rates of NSSI are highest among youth and young adults. Among non-clinical populations of youth, rates of NSSI have ranged from 13% to 45% (Lloyd-Richardson et al., 2007; Plener et al., 2009; Ross & Heath, 2002). Rates among clinical
populations of youth are higher and often range from 40% to 61% (Darche, 1990; DiClemente et al., 1991). With respect to young adults, studies have reported rates between 5% and 35%, with many centering around 17% (for a review see Lewis & Arbuthnott, 2012). Of note are several recent reports that highlight the importance of NSSI as a significant issue among young adults across college campuses in Canada (Heath, Toste, Nedecyeva, & Charlebois, 2008; Lewis & Arbuthnott, 2012) and the United States (Gollust, Eisenberg, & Golberstein, 2008; Lewis & Arbuthnott, 2012; Whitlock, Eckenrode, & Silverman, 2006).

Engagement in NSSI confers risk for physical injury and scarring. Related to this, NSSI methods may put individuals at risk such as cutting deeper than intended, causing a substantial blood loss, or possible infection resulting from the use of unsanitary or contaminated instruments for self-harm (Klonsky et al., 2011). Beyond the immediate risks associated with acts of NSSI, engagement in the behaviour often co-occurs with mental health difficulties, including but not limited to: major depression, primary anxiety disorders, emotion dysregulation, and eating disorders (Klonsky et al., 2011).

The functions or motives of NSSI are generally considered intrapersonal (e.g., self-focused such as emotional regulation, and self-punishment) and interpersonal (e.g., social, influencing others, peer bonding), with emotional regulation constituting the most commonly reported function of NSSI (Klonsky, 2007, 2009). It is worth noting, however, that there are many reasons for NSSI that go beyond the examples mentioned above and that individuals who engage in NSSI often report more than one reason for NSSI, and these reasons can also change over time.

In addition to the above, the association between NSSI and suicidal thoughts and behaviours (STB) has been shown to be particularly noteworthy. Multiple cross-sectional studies
have found high rates of NSSI and STB in both inpatient and community samples of adolescents, with 19% to 63% of the individuals in community samples reporting a history of both NSSI and STB (Whitlock & Knox, 2007; Muehlenkamp & Gutierrez, 2007; Brausch & Gutierrez, 2010; Plener et al. 2009). Additionally, it has been found that NSSI significantly predicts later or concurrent STB (Whitlock et al., 2012). Indeed, many of those with a history of NSSI may go on to attempt suicide (Nock, 2009). In sum, and in light of the various consequences of NSSI, it is important to understand what may be involved in the NSSI recovery process as this may shed light on ways to mitigate against the above risks.

**NSSI Recovery**

Although only a few studies have examined NSSI recovery (e.g., Grunberg & Lewis, 2015), there is reason to believe that this process is difficult for those who self-injure. For example, as NSSI is most often enacted to provide relief from states of overwhelming negative emotion, NSSI cessation can be quite challenging (Kress & Hoffman, 2008; Grunberg & Lewis, 2015; Klonsky et al., 2011). Indeed, if NSSI works to provide needed psychological relief and individuals do not have other means by which to do this, many individuals may find it difficult to stop self-injuring (Grunberg & Lewis, 2015; Kress & Hoffman, 2008). In other words, NSSI may be reinforcing itself (Klonsky, Victor, & Safer, 2014).

In keeping with the above, many individuals who self-injure report being ambivalent or reluctant to stop NSSI (Klonsky, Victor, & Safer, 2014). Research examining NSSI e-communication may help to shed some light on the reasons behind this ambivalence or reluctance. For example, across a number of NSSI e-communities, people often describe their experience of NSSI as an effective means of coping with distressing emotions; a way that is not always painful, and sometimes even resembling an unstoppable addiction (Lewis et al., 2012). In
other words, the decision to engage in NSSI over other affect-regulating strategies may be preferred because NSSI is seen as an effective and easily-implemented way of gaining control over one's emotional experiences, which in the absence of an alternative affect-regulating strategy may be perpetuating the ambivalence and reluctance to stop (Nock, 2010). Considering the perceived utility of NSSI as an emotion-regulating method without any perceived alternative strategy among the individuals who self-injure, seeking help and recovery is often not seen as necessary and desirable, presumably due to the lack of motivation to quit this maladaptive coping strategy (Klonsky et al., 2011). Due to the rather complicated nature of NSSI, further research of the recovery process is warranted. There is a need for a framework that would help to understand NSSI recovery, and one that would account for it being a non-linear and potentially difficult process for those who self-injure.

The Transtheoretical Stages of Change Model

Following from the above, there may be merit in understanding NSSI within a model that considers resistance toward and ambivalence about NSSI recovery. One framework that may have utility in this regard is the Transtheoretical Stages of Change Model (TTM; DiClemente & Prochaska, 1998). Indeed, the TTM considers attitudes towards recovery and thus may be ideally suited to capture aspects of resistance and ambivalence in the context of NSSI recovery.

In the TTM, behavioural change is described as a process in which people progress through a series of five stages of change readiness (Norcross et al., 2011). To date, the TTM has been successfully used to understand cessation of an array of harmful behaviours (e.g., cigarette smoking, unprotected sex; DiClemente et al., 1991, Belcher et al., 1998). The five stages of change readiness include Precontemplation, Contemplation, Preparation, Action, and Maintenance (Norcross et al., 2011). Individuals in the Precontemplation stage are mostly
unaware of their problem and show no intention of changing their behaviour (Norcross, Krebs, & Prochaska, 2011). However, friends, family, and other people known to these individuals are aware that the problem exists. The recognition of the problem by the individual enacting the harmful behaviours happens in the Contemplation stage, which constitutes the second stage of change readiness according to TTM. This stage also involves serious thoughts of overcoming the problem without actually making a commitment to change. Pondering about the amount of effort, energy, and loss it would take to overcome the maladaptive behaviour also takes place in this stage. In the Preparation stage individuals intend to change their behaviour in the near future (e.g., upcoming weeks) and tend to already exhibit small changes in their behaviour (i.e., "baby steps"). The Action stage begins when the intention to change one's maladaptive behaviour turns into the actual full behavioural change. In this stage individuals often modify their experience and surroundings, along with their behaviours. Finally, once behavioural change has been maintained for a period of a day and up to six months individuals are considered to be in the Action stage. Following this (i.e., post 6-months), individuals are considered to be in the Maintenance stage of change readiness and are working to prevent relapse and consolidate their achievements. This stage is viewed as lasting indefinitely as long as there is no relapse of the maladaptive behaviour.

The utility of the TTM as a means to understand and reliably predict how individuals respond to treatments aimed at diminishing maladaptive behaviour has been demonstrated in multiple studies (Dozois et al., 2004). Adapting and tailoring treatment to the individual based on his or her attitude towards recovery may help to facilitate the positive outcome of therapy and increase its effectiveness (e.g., Beitman, Beck, Deuser, Carter, Davidson, & Maddock, 1994; Reid, Nair, Mistry, & Beitman, 1996; DiClemente, Ponton, & Hartley, 1991;Kerns & Rosenberg,
Indeed, a particularly important aspect of the TTM’s stages of change that have been identified as amenable to therapeutic treatment are people’s attitudes toward recovery – or, attitudes toward stopping the maladaptive behaviour of interest. Measuring attitudes toward recovery has been done successfully and has been rendered clinically useful in terms of understanding the process of cessation of maladaptive behaviours such as smoking and HIV risk-related behaviours (DiClemente et al., 1991; Carey, Maisto, Kalichman, Forsyth, Wright, & Johnson, 1997). Adjusting the treatment approach based on the person’s attitude toward recovery (e.g., ambivalence, resistance) has been shown to have a positive influence on the success of treatment of the behaviours described below (Beitman et al. 1994; Reid et al., 1996; DiClemente et al., 1991).

Generally, individuals with attitudes consistent with the earlier stages of change readiness (i.e., Precontemplation, Contemplation) show less positive outcomes after therapy compared to the individuals whose attitudes are consistent with the later stages of the change readiness (i.e., Action, Maintenance). For instance, Beitman et al. (1994) found that the stage of the participants' readiness to change, or their attitude toward recovery showed a strong correlation with the participants' outcome in the placebo-controlled trial which examined the efficacy of a panic disorder medication in outpatients suffering from panic disorder and agoraphobia. In this study participants in the earlier stages of change readiness (i.e. Precontemplation) were less likely to show improvement in their condition compared to the participants in the later stages of change readiness (Beitman et al. 1994). Similar results were found in a randomized double-blind study exploring the effect of a medication (adinazolam) on the symptoms of panic disorder and agoraphobia (Reid et al., 1996). Here, participants who were in the Precontemplation stage (i.e.
earlier stage) showed slower recovery than the participants in the contemplation stage (i.e. later stage). This differential treatment outcome based on the stage of change readiness was also shown to hold true for other behaviours such as smoking cessation (DiClemente et al., 1991), pain management (Kerns and Rosenberg, 2000), weight loss (IngleDew, Markland, & Medley, 1998), managing HIV risk-related behaviours (Carey, Maisto, Kalichman, Forsyth, Wright, & Johnson, 1997), and increasing condom use (Belcher et al., 1998). Although the TTM has been applied successfully for other behaviours, efforts to do this for NSSI in practice are scant – notwithstanding a few recent efforts (Grunberg & Lewis, 2015; Kress & Hoffman, 2008).

**NSSI & The Transtheoretical Stages of Change Model**

Several researchers have highlighted the potential for the TTM in understanding NSSI recovery. For example, motivational Interviewing (MI), which is used in the context of the TTM and rooted in resolving clients ambivalence towards recovery, has been highlighted as a particularly promising treatment for NSSI (Klonsky et al., 2011). Indeed, as many individuals who self-injure may have reticence or ambivalence to stop self-injuring, MI may be particularly well suited to helping individuals become motivated to work toward NSSI recovery. Specifically, it may help to resolve client’s ambivalent attitudes about stopping NSSI so that clients want to change themselves (Klonsky et al., 2011) as it has been implicated in the past via principles applied in the MI (Kress & Hoffman, 2008). Avoiding confrontation and helping clients with generating reasons and motivations for change, are crucial aspects of MI (Wahab, 2005). The emphasis in MI is on client's autonomy and self-determination, which may help to enhance the trust and the parity between counsellors’ and clients’ agendas, diminishing client's ambivalent attitude toward NSSI cessation (Kress & Hoffman, 2008). It is important to acknowledge and recognize that not all clients are ready and willing to take the necessary steps toward recovery.
from NSSI, therefore being familiar with the client's attitude toward recovery may aid in developing effective treatment plans (Kress & Hoffman, 2008).

Adding to the view that the TTM may be useful in understanding NSSI recovery, researchers have recently found evidence that views toward NSSI recovery can be conceptualized using the TTM (Grunberg & Lewis, 2015). In this study, researchers content analyzed online posts pertinent to people’s views about NSSI recovery – that is, whether they thought this was possible to overcome NSSI. Their results indicated that majority of the posts fell into the Precontemplation and Contemplation stages, though other stages were also evidenced. Moreover, individuals in the earlier stages of change readiness endorsed more reasons to not stop NSSI; those in later stages of change readiness endorsed fewer reasons to not stop NSSI and more reasons to stop. Taken together, these findings provide preliminary evidence for the utility of TTM as a means by which to understand NSSI recovery (Grunberg & Lewis, 2015). If it is the case that the TTM has usefulness in this regard, there may be merit in identifying ways to reliably and validly measure aspects of the TTM, such as attitudes toward NSSI recovery, among those who report NSSI history.

**Current Study**

Identifying means to measure attitudes toward NSSI recovery seems warranted. Unfortunately, however, there is no existing valid and reliable measure for these purposes. Having a measure to soundly assess attitudes toward NSSI recovery may help mental health care providers' ability to implement appropriate stage-matched therapy for self-injuring individuals. It may also be useful to researchers examining NSSI recovery and the TTM as a means to understand this process (e.g., Grunberg & Lewis, 2015). Building on calls from a number of NSSI researchers (Grunberg & Lewis, 2015; Klonsky et al., 2011; Kress & Hoffman, 2008), the
current study involved the adaptation and evaluation of two existing scales to assess attitudes toward NSSI recovery within the context of the TTM stages of change readiness. Specifically, existing TTM scales used to measure attitudes among clients enacting other harmful behaviours were adapted to assess attitudes toward NSSI recovery. The two scales used in the present research include the University of Rhode Island Change Assessment (URICA; McConnaughy, Prochaska, & Velicer, 1983) scale and the Stages of Change Readiness and Treatment Eagerness scale (SOCRATES; Miller & Tonigan, 1996). Both are discussed below. To evaluate the factorial validity of the scales, a sample of university students was recruited. Indeed, past research suggests that NSSI is quite common on university campuses (Lewis & Arbuthnott, 2012). The reported prevalence of NSSI among university students is particularly high, ranging between 5% and 35%, with most reported rates centering around 17% (Gratz, 2001; Nada-Raja, Skegg, Langley, Morrison & Sowerby,2004; Withlock et al., 2006). Moreover, of those people reporting a history of NSSI, almost 40% reported the onset occurring in their late teenage years or early adulthood (i.e., age of most university students), which makes this population one of the highest risk groups for NSSI (Whitlock et al. 2006).

**Study Aims**

Factorial validity of the URICA and the SOCRATES was examined in order to determine the utility of each of these assessment tools in order to ascertain if one is better suited to assess attitudes towards NSSI recovery than the other. The SOCRATES is a 19-item self-report inventory assessing motivation to change and attitudes towards recovery based on the stages of change which are reflected in the three subscales of the SOCRATES: Recognition, Ambivalence, Taking Steps. The first subscale, Recognition, accounts for the Precontemplation stage of the original TTM. The Ambivalence subscale corresponds to the Contemplation stage of the TTM
and the Taking Steps subscale corresponds to the last two stages of the original TTM, namely the Action stage and the Maintenance stage (McConnaughy, Prochaska, & Velicer, 1983; Miller & Tonigan, 1996).

The URICA is a 32-item self-report inventory assessing attitudes toward recovery based on the following four stages of change readiness of the original TTM, which also represent the four subscales of the URICA: Precontemplation, Contemplation, Action, and Maintenance (McConnaughy, Prochaska, & Velicer, 1983). The URICA is intended to be a sensitive measure of the attitudes reflecting client's readiness to change and it is meant to apply to a wide range of maladaptive behaviours (McConnaughy, Prochaska, & Velicer, 1983). The four-factor structure captured in the above mentioned subscales is considered to be the most parsimonious in terms of accounting for client's attitudes towards recovery, leaving out only the Preparation stage of original TTM (Dozois et al., 2004).

Both the SOCRATES and the URICA show good validity and reliability when applied to other harmful behaviours (e.g., Dozois et al., 2004; Field et al., 2009; Carey et al., 2001; Miller & Tonigan, 1996). However, findings regarding the factor structure of the two scales vary among studies, with some studies reporting moderate to inadequate fit to the intended subscales, and some studies showing adequate fit to the intended subscales (Dozois et al., 2004; Field et al., 2009; Carey et al., 2001; Miller & Tonigan, 1996). In case of the URICA, some researchers have found support for the proposed four factors of the URICA using a confirmatory factor analysis (CFA) or an exploratory factor analysis, as determined by McConnaughy et al. (1983), when applied to other harmful behaviours (Carney & Kivlahan, 1995; DiClemente & Hughes, 1990; Hilburger, 1995; McConnaughy et al,1989; O’Hare, 1996; Pantalon et al., 2002; Rollnick et al.,1992; Dozois et al., 2004). However, while there is some support documented for the URICA,
there are a number of studies that found no support for the four factor structure of the URICA, after conducting a CFA or an EFA (e.g., Dozois et al., 2004; Figlie et al., 2005; Eckhardt & Utschig, 2007; Elder et al., 1990; Isenhart, 1994; Stern et al., 1987). Similarly, some researchers have found support for the original three-factor structure model for the SOCRATES initially identified by Miller & Tonigan (1996) for other harmful behaviours, after conducting a CFA or an EFA (e.g., Mitchell, Francis, & Tafrate, 2005; Vik, Culbertson, & Sellers, 2000). Despite these reports, support for the SOCRATES’ factor structure is not always reported (e.g., Bertholet et al., 2009; Busby and Parker, 1997; Dermen, Koutsky, Connors, & Czarnecki, 1997; Maisto et al., 1999; Maisto, Chung, Cornelius, & Martin, 2003).

In the present study, both scales were adapted to reflect attitudes toward NSSI recovery. As these scales have been successfully tailored to a number of other problem behaviours, it was anticipated that the same can be done for NSSI. However, as it is unclear which scale is better suited for NSSI (and it may be that both or neither are), the factor structure of the adjusted URICA and the adjusted SOCRATES were compared. This seems particularly warranted in light of the above-mentioned research indicating that the factor structure of these scales may vary across behaviours. It was hypothesized that the two scales will have a comparably good factor structure in terms of their factors fitting into the intended subscales (i.e., stages of change). In order to examine the factorial validity of the scales, confirmatory and exploratory factor analyses were used, as suggested by the past research (e.g., Dozois et al., 2004; Eckhardt & Utschig, 2007; Elder et al., 1990; Figlie et al., 2005; Isenhart, 1994; Mitchell, Francis & Tafrate, 2005; O’Hare, 1996; Pantalon et al., 2002; Stern et al., 1987; Vik, Culbertson, & Sellers, 2000).
Method

Participants

A sample of 351 participants was recruited from the undergraduate population at University of Guelph via the university participant pool. All students who have engaged in NSSI (in the past or currently) were eligible to participate in the current study. Majority of the sample identified as female ($n=274; 78.06\%$). The average age of participants was 18.65 years ($SD=1.71$). In terms of ethnicity, most of the participants identified as European, White, Caucasian ($n=283; 80.6\%$). Other reported ethnicities included Asian ($n=24; 6.8\%$), Multiracial ($n=15; 4.3\%$), Arab ($n=10, 2.8\%$), Aboriginal, First Nations, Métis ($n=5, 1.4\%$), Caribbean ($n=5, 1.4\%$), Latin, Central, or South America ($n=3, 0.6\%$), Other ($n=3, 0.6\%$), Black ($n=2, 0.6\%$), and Pacific Islanders ($n=1, 0.3\%$). Of the current sample, 48 participants (13.7%) reported currently seeking help for a mental health problem and 103 participants (29.3%) reported seeking help for a mental health problem in the past. Also, 8 participants (2.2%) reported currently seeking treatment for NSSI, and 77 participants (21.9%) reported seeking treatment for NSSI in the past.

Measures

Demographic Information Questionnaire

A self-report Demographic Information Questionnaire (APPENDIX A) was administered to all participants. The questionnaire collected basic demographic information such as age, gender, and ethnicity. This questionnaire also assessed participants’ past experience seeking professional help for a mental health concern and for self-injury specifically.
Inventory of Statements About Self-Injury

The Inventory of Statements About Self-Injury (ISAS; APPENDIX B) is a self-report questionnaire that inquires about the types, frequency, and functions of NSSI. The first item form the ISAS was included in the current study for the purpose verifying participants' history of NSSI, as well the purpose of clarifying the definition of NSSI for the participants. The item used inquired about the lifetime frequency of various methods of NSSI.

University of Rhode Island Change Assessment Scale

The University of Rhode Island Change Assessment Scale (URICA; APPENDIX C) is a 32-item self-report inventory assessing attitudes towards recovery based on the stages of change described by the TTM (McConnaughy, Prochaska, & Velicer, 1983). The URICA contains four subscales comprising attitudes regarding the Precontemplation, Contemplation, Action, and Maintenance stages of change which are a part of the original TTM (DiClemente & Prochaska, 1998). Each of the four stages contains eight Likert-type items that range in scores from 1 to 5; higher scores indicate stronger endorsement of a particular attitude (Field et al, 2009). For the purposes of the current study this scale was adapted in the following ways: the words in each item indicating a problem or harmful behaviour were replaced with words that reflect the attitudes and behaviours pertaining to NSSI.

Stages of Change Readiness and Treatment Eagerness Scale

The Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES; APPENDIX D) is a 19-item self-report inventory assessing attitudes towards recovery based on the stages of change described by the TTM. (McConnaughy, Prochaska, & Velicer, 1983; Miller & Tonigan, 1996). The SOCRATES yields three subscales comprising attitudes regarding the following components: Recognition, Ambivalence, and Taking Steps. Each of these reflect the
stages of change of the TTM (McConnaughy, Prochaska, & Velicer, 1983). Each subscale contains four to eight Likert-type items that range in scores from 1 to 5; higher scores indicate stronger endorsement of a particular attitude (Field et al, 2009). For the purposes of the current study this scale was adapted in the following ways: the words in each item indicating a harmful behaviour were replaced with words that reflect the attitudes and behaviours pertaining to NSSI.

**Procedure**

Interested participants were directed to a study website on which they were presented with an informed consent form. Upon providing consent, they were given access to the study questionnaires. The participants completed the following questionnaires online: the demographic information questionnaire, the URICA, and the SOCRATES. These questionnaires as well as the informed consent were delivered to the participants via online secure research software Qualtrics. After completing the questionnaires all the participants were awarded one credit point in the fulfillment of the optional research requirement of the Introductory Psychology class.

**Overview & Analytic Plan**

The factor structures of two measures, namely the University of Rhode Island Change Assessment Scale, URICA and Stages of Change Readiness and Treatment Eagerness Scale, SOCRATES, were examined using confirmatory factor analysis (CFA) in order to determine their factorial validity regarding the measurement of attitudes toward recovery in young adults engaging in NSSI. The Lavaan package in R Studio software was used to confirm the factor structures for each scale, as described below. When using this approach, good structural model fit indices include a non-significant chi-square value, comparative fit index (CFI) and Tucker-Lewis fit index (TLI) values above .95, RMSEA (root mean square error of approximation) values lower than .05, although .08 is acceptable, and SRMR (standardized root mean square
As a first step, the initial CFAs are computed using the whole data set for both URICA and SOCRATES (i.e., Initial CFA: Whole Data Set sections). The second step involves the method of cross-validation (i.e., Cross-Validation: Overview section), which is employed to further examine the factor validity of URICA and SOCRATES. This involves splitting the data set in two randomly selected sub-samples and conducting another CFA on the first half of the data set, to verify the adequacy of the model fit (i.e., Initial CFA: Split Sample sections). From here, adjustments are made to the factor structure of the models by making theoretically sensible changes based on the modification indices and the standardized factor loadings using the first half of the data set. This is done in an attempt to find a factor model that is conceptually, theoretically, and statistically sound. The current analysis contains two stages of these modifications for each URICA and SOCRATES (i.e., Modifications: Stage 1 and Modifications: Stage 2 sections), each of which are followed by a CFA to evaluate the newly formed models. Following the two stages of modifications, the final model is validated on the second half of the data set by conducting the confirmatory factor analysis of the newly established model. In case that an acceptable structure model is not achieved, an exploratory factor analysis is conducted on the whole data set to explore the factor structure of the data (i.e., EFA-Whole Data Set sections). The factor structure yielded by the EFA is subsequently evaluated by the final CFA (i.e., CFA-Model based on the EFA Findings section). The results of these analyses are described below.
Results

URICA: Initial CFA - Whole Data Set

The proposed four-factor model of URICA consists of the following factors: Precontemplation, Contemplation, Action, and Maintenance (McConnaughy, Prochaska, & Velicer, 1983). These were used when computing the CFA and determining their fit with the data. Based on the responses from participants, the sample consisted of on 347 observations (n=347) for the URICA, with no missing data. The results of the initial CFA indicated that URICA had an inadequate fit between its intended factor structure model and the observed data. Specifically, the model fit indices show an inadequate fit: chi-square $\chi^2(458)= 1849.96, p < .01$, RMSEA = .09, SRMR= .13, CFI= .74, TLI=.72. Although a significant chi-square is sometimes of concern, it is not of high concern in the current study, since the sample size is relatively large (n=347; Cheung & Rensvold, 2002). In sum, these results indicate an inadequate fit of the data to the intended four-factor model of the URICA – at least within the sample used.

Cross-Validation: Overview

Since the initial CFA (which involved the whole data set) showed an inadequate fit between its theoretical factor structure model and the observed data, a cross-validation method was implemented. As described above, this method involves splitting the data set in two randomly selected sub-samples, adjusting the factor structure of the models by making theoretically sensible changes based on the modification indices and the standardized factor loadings using the first half of the data set, in an attempt to find a factor model that is conceptually, theoretically, and statistically sound. In this case, two attempts at finding an adequate model were made for each of the two measures. Following these steps, the models are
validated on the second half of the data set by conducting the confirmatory factor analysis of the newly established models, if such models are achieved.

**URICA: Initial CFA- Split Sample**

After splitting the data, a CFA was conducted to assess whether a comparably poor factorial validity of the URICA would be found in the abbreviated data set. The results of this subsequent CFA indicated that URICA had a comparably inadequate fit between its theoretical factor structure model and the observed data in the abbreviated data set. Specifically, the URICA had an inadequate fit, as indicated by the following model fit indices: $\chi^2(458)=1134.90, p < .01$, $RMSEA = .09$, $SRMR=.13$, $CFI=.73$, $TLI=.71$.

**URICA: Modifications- Stage 1**

Based on the further examination of the standardized factor loadings, modification indices, and evaluation of the theoretical soundness of the suggested modifications, the following changes were implemented in URICA before conducting the subsequent CFA. First, Item 1 ("As far as I'm concerned, I don't have any problems with self-injury that need changing," Precontemplation factor) was removed from the model due to its problematic nature (i.e., low standardized factor loading on its original factor, high loading on another factor, residual error of this item is highly correlated with Item 10's residual error). Items 10 and 20 ("At times my problem with self-injury is difficult, but I'm working on it," and "I have started working on my problems with self-injury but I would like help," both Action factor) were also removed from the model, because their standardized factor loadings onto their corresponding factors were low (.56 and .38, respectively), they were both loading highly on two other factors, and arguably, their wording is double-barrelled. Furthermore, Item 27 ("I would like to prevent myself from having a relapse of my problem with self-injury,") was removed due to its low standardized
factor loading onto its corresponding factor, and the item also loaded highly on two other factors and, arguably, its seemingly awkward wording.

After these changes were made, another CFA was conducted to evaluate the newly implemented structure of URICA. The results of this CFA indicated that URICA again had an inadequate fit between its new structure model and the observed data. Specifically, the inadequate fit was indicated by the following model fit indices: chi-square $\chi^2(344)= 670.55$, $p<.01$, $RMSEA = .08$, $SRMR=.10$, $CFI=.84$, $TLI=.83$. As with the above analyses, the statistically significant chi-square value was not of high concern in this case, since the sample size was relatively large ($n=171$; Cheung & Rensvold). These results indicated an inadequate fit of the data to the adjusted model of the URICA.

**URICA: Modifications- Stage 2**

Since the factorial validity of URICA was poor after the first stage of adjustments, another attempt to modify the structure of the scale was made based on the modification indices, standardized factor loadings, and based on consideration of the theory behind the items.

The following changes were made on the adjusted version of the URICA, before conducting the subsequent CFA. Item 23 ("I may be part of the problem with self-injury, but I don't really think I am," Precontemplation factor) was removed due to its relatively low standardized factor loading (.43) and the fact that it was also loading on the Contemplation factor, which would be consistent with the wording of the item. Similarly, Item 31 ("I would rather cope with my faults than try to change them," Precontemplation factor) was removed due to the low standardized factor loading (.32), that it was also loading on two other factors, and its vague wording (i.e., not clear what is meant by coping).
After these changes were implemented, another CFA was conducted in order to assess the factorial validity of the adjusted URICA. Again, the results of this CFA indicated that URICA and had an inadequate fit between its adjusted structure model and the observed data. Specifically, the URICA’s inadequate fit was shown in the following model fit indices: chi-square $\chi^2(293)= 579.96$, $p<.01$, $RMSEA = .08$, $SRMR= .09$, $CFI= .86$, $TLI=.84$). Here again the statistically significant chi-square value is not of high concern in this case, since the sample size is relatively large ($n=171$; Cheung & Rensvold 2002). These results indicate an inadequate fit of the data to the adjusted four-factor model of the URICA.

**URICA: EFA-Whole Data Set**

Since neither of the adjusted models showed a sound factorial validity of URICA, an exploratory factor analysis (EFA) was conducted to examine the general factor structure of the data. The EFA was conducted using the IBM SPSS Statistics 23 software. The data was factor analyzed with an oblique (i.e., promax) rotation, as is recommended in cases when factor correlation matrix shows correlations around .32 and above, which is the case in the current study (Tabachnick & Fidell, 2007). Only factors with eigenvalues of $\geq 1$ were retained (Stevens, 1996). The highest positive loading of each item was considered in deciding which item belongs to which factor, since none of the items on URICA was intended to be reverse coded (Zimbardo & Boyd, 1999). EFA findings from the URICA revealed five factors with eigenvalues exceeding 1.00; specifically, 10.28, 3.45, 2.65, 1.36, and 1.17. This analysis suggested that five factors should be extracted to yield the most parsimonious solution to the data. The five main factors accounted for a cumulative 59.06% of variance in participants’ responses. The factor loadings are presented in Table 1.
As noted earlier, the items comprising the URICA are intended to be captured by four subscales (i.e., Precontemplation, Contemplation, Action, and Maintenance), based on past studies for other behaviours (e.g., Carney & Kivlahan, 1995; DiClemente & Hughes, 1990; Hilburger, 1995; McConnaughy et al., 1989; O’Hare, 1996; Rollnick et al., 1992). In the present study, which indicated five factors, Factor I consisted mainly of items pertaining to the Maintenance subscale, although two of the items from the Contemplation subscale and one of the Action subscale items also loaded on this factor. This factor accounted for 32.14% of the variance. Factor II (10.77% of the variance) was made up mainly of items from the Action subscale; however, one item from the Maintenance subscale also loaded on this factor. Factor III comprised one Precontemplation item, three Contemplation items, one Action item, and one Maintenance item and accounted for 8.27% of scale variance. Factor IV comprised only Precontemplation items and accounted for 4.23% of scale variance. Finally, Factor V consisted of three Contemplation items and accounted for 3.65% of the variance.

Overall, the EFA of the URICA produced five factors, which is in contrast to the four original factors used in past research for other behaviours (e.g., Carney & Kivlahan, 1995; DiClemente & Hughes, 1990; Hilburger, 1995; McConnaughy et al., 1983; McConnaughy et al., 1989; O’Hare, 1996; Rollnick et al., 1992). Although Factors I, II, IV, and V do show some degree of consistency with the original factor model, Factor III is not consistent with the intended four factor model. Moreover, there is cross-loading for several items across multiple factors, which rendered several individual factors difficult to coherently describe. This is addressed further in the Discussion.
**URICA: CFA - Model based on EFA findings**

After obtaining the structure model of URICA, as suggested by the results of the EFA, additional CFA based on this model was conducted to evaluate the factorial validity of this structure model. The results of the CFA indicated that URICA had an inadequate fit between its suggested factor structure model and the observed data. Specifically, the URICA yielded the following model fit indices: \( \chi^2(454)= 1244.11, p<.01, \text{RMSEA} = .07, \text{SRMR} = .09, \text{CFI} = .85, \text{TLI} = .84 \). As with previous analyses, the statistically significant chi-square value was not of high concern since the sample size was relatively large (\( n=347 \); Cheung & Rensvold 2002). These results indicate an inadequate fit of the data to the five-factor model of URICA that was found in the EFA. Overall, none of the models of the URICA examined in the current study yielded an acceptable factorial validity. The examination of the SOCRATES followed similar steps and is described in the following sections.

**SOCRATES: Initial CFA - Whole Data Set**

The proposed three-factor model of SOCRATES consists of the following factors: Recognition, Ambivalence, and Taking Steps (Miller & Tonigan, 1996). As was the case with the URICA, these subscales were used when computing the CFA and determining their fit with the data. In the case of this measure, 342 observations were used, with no missing data. The results of the initial CFA indicated that the SOCRATES had an inadequate fit between its intended factor structure model and the observed data, as indicated by the model fit indices: \( \chi^2(149)=662.34, p < .01, \text{RMSEA} = .10, \text{SRMR} = .11, \text{CFI} = .86, \text{TLI} = .84 \). Again, the statistically significant chi-square value is not of high concern since the sample size is relatively large (\( n=342 \); Cheung & Rensvold, 2002). These results indicate an inadequate fit of the data to the intended three-factor model of the SOCRATES—at least within the sample used.
SOCRTAES: Initial CFA- Split Sample

Since the initial CFA, which involved the whole data set, showed an inadequate fit between its theoretical factor structure model and the observed data, a cross-validation method was implemented again. Similar to the above, after splitting the data, a CFA was conducted to assess whether a comparably poor factorial validity of the SOCRTES would be found in the abbreviated data set. The results of this subsequent CFA indicated that the SOCRTES had an inadequate fit between its theoretical factor structure model and the observed data in the abbreviated data set. Specifically, the SOCRATES had an inadequate fit as indicated by the following model fit indices: chi-square: chi-square $\chi^2(149)=472.19$, $p<.01$, $RMSEA = .11$, $SRMR= .12$, $CFI= .83$, $TLI=.80$.

SOCRATES: Modifications- Stage 1

Based on the examination of the modification indices, and evaluation of the theoretical soundness of these potential modifications, the following changes were made on the SOCRATES before conducting the subsequent CFA. Specifically, item 1 ("I really want to make changes in my self-injuring habits,") was moved from the Recognition factor to the Taking Steps factor, as suggested by the modification indices, and its low standardized factor loading onto its original factor. Semantically, the wording of this item could also reflect the attitude of a person who endorses the attitude captured by the Taking Steps subscale. Furthermore, Item 2 ("Sometimes I wonder if I am a self-injurer," Ambivalence factor) was removed from the scale due to its low standardized factor loading onto its corresponding factor (.26), and because the modification indices do not provide any suggestions regarding this item. Additionally, the wording of this item arguably does not have the same connotation in the context of NSSI as it would have if it was applied to other harmful behaviours (e.g., alcoholic vs. self-injurer, the term
"alcoholic" is arguably more widely used). Item 14 ("I want help to keep from going back to the self- injuring problems that I had before") was also removed due to its problematic nature (i.e., relatively low standardized factor loading in combination with the item loading on highly on two other factors).

After these changes were made, another CFA was conducted to evaluate the newly implemented structure of the SOCRATES. The subsequent CFA indicated that the SOCRATES had an inadequate fit between the adjusted model and the observed data, as evidenced by the following model fit indices: chi-square $\chi^2(116)=345.55$, $p < .01$, $RMSEA = .11$, $SRMR= .11$, $CFI= .87$, $TLI=.85$. As with the above analyses, the statistically significant chi-square value is not of high concern, since the sample size was relatively large (n= 171; Cheung & Rensvold 2002). These results indicate an inadequate fit of the data to the adjusted three-factor model of the SOCRATES.

**SOCRATES: Modifications- Stage 2**

Since the factorial validity of SOCRATES was poor after the first stage of adjustments, another attempt to modify the structure of the scale was made based on the modification indices, standardized factor loadings, and based on consideration of the theory behind the items. In an attempt to improve the factor structure of the SOCRATES, the following adjustments were made. Specifically, item 1 ("I really want to make changes in my self-injuring habits,"), which was previously moved to the Taking steps, was removed in this step due to the fact that it was loading also on two other factors (as it may be non-discriminant in nature). Similarly, modification indices showed that Item 8 ("I've been thinking that I might want to change something about myself," Taking Steps factor) and Item 15 ("I know that I have a problem with self- injury," Recognition factor) were loading on two of other factors as well as their original
factors. Furthermore, the wording of Item 8 as arguably vague (i.e., it does not specify what "something" means to the respondent); in addition to this, item 15 could be endorsed by people whose attitudes toward recovery are consistent with any of the stages outlined in the SOCRATES (i.e., people who are ambivalent or who already are taking steps toward recovery indicating their agreement with this item).

After these changes were implemented, another CFA was conducted in order to assess the factorial validity of the adjusted SOCRATES. Here again, the results of this CFA indicated that SOCRATES had an inadequate fit between its adjusted structure model and the observed data. Specifically, the inadequate fit of the SOCRATES was shown in the following model fit indices: chi-square $\chi^2(74)=179.86, p <.01, RMSEA = .09, SRMR = .08, CFI= .91, TLI=.89$. Also similar to previous analyses, the statistically significant chi-square value was not of high concern, since the sample size is relatively large ($n= 171$; Cheung & Rensvold 2002). These results indicate an inadequate fit of the data to the theoretical three-factor model of the SOCRATES. Comparatively, however, these statistical indicators show a better fit than the previous assessed structures.

Since a factor structure model that would be conceptually, theoretically, and statistically sound was not found in any of the attempts outlined above, these models were not validated on the second half of the data sample as was originally intended.

**SOCRATES: EFA - Whole Data Set**

Since neither of the adjusted models resulted in a clear picture of the factorial validity of the SOCRATES, an exploratory factor analysis (EFA) was conducted to examine the factor structure of the data. The EFA was conducted using the IBM SPSS Statistics 23 software. As with the URICA, the data was factor analyzed using EFA with an oblique (i.e., promax) rotation,
as is recommended in cases when factor correlation matrix shows correlations around .32 and above, which is the case in the current study (Tabachnick & Fidell, 2007). Only factors with eigenvalues of ≥1 were retained (Stevens, 1996). The highest positive loading of each item was considered in deciding which item belongs to which factor, since none of the items on SOCRATES was intended to be reverse coded (Zimbardo & Boyd, 1999).

As noted above, the items on the SOCRATES are intended to fall under three subscales (i.e., Recognition, Ambivalence, and Taking Steps), based on the scales previously used by researchers in past studies for other behaviours (e.g., drinking; Miller & Tonigan, 1996). In the current study, however, the EFA of the SOCRATES revealed two factors with eigenvalues exceeding 1.00; namely, 7.74 and 3.24. The two main factors accounted for a cumulative 57.78% of variance in participants’ responses; factor loadings are presented in Table 2. Factor I consisted mainly of items pertaining to Recognition (six items) and Ambivalence (four items) factors. This factor accounted for 40.74% of the variance. Factor II (17.05% of the variance) was made up mainly of Taking Steps items, although one of the items from the Recognition subscale also loaded on this factor. The factor structure of SOCRATES produced two rather than three original factors, which is not consistent with the intended original factor structure (Miller & Tonigan, 1996).

**SOCRATES: CFA- Model based on EFA findings**

After obtaining the structure model of SOCRATES, as suggested by the results of the EFA, additional CFA based on this model was conducted to evaluate the factorial validity of this model. The results of the CFA indicated that SOCRATES again had an inadequate fit between its suggested factor structure model and the observed data. Specifically, the SOCRATES yielded the following model fit indices: $\chi^2 (151)=626.10$, $p<.01$, $RMSEA = .10$, $SRMR= .10$, $CFI=$
The statistically significant chi-square value was again not of high concern, as the sample size was relatively large (n=342; Cheung & Rensvold 2002). These results indicate an inadequate fit of the data to the two-factor model of SOCRATES that was found in the EFA. Overall, none of the models of the SOCRATES examined in the current study yielded an acceptable factorial validity.

The current study was conducted in an effort to examine the factor structure of two adapted measures of attitudes toward recovery from NSSI in light of mixed evidence for their factorial validity when applied to other behaviours (e.g., Carney & Kivlahan, 1995; DiClemente & Hughes, 1990; Dozois et al, 2004). Overall, findings stemming from several CFA attempts did not support the intended (original) factor structures of the URICA or the SOCRATES. On one hand, these findings are consistent with those from a number of studies, which also failed to find support for the intended factor structures of URICA and SOCRATES (e.g., Dozois et al, 2004, Elder et al., 1990; Stern et al., 1987, Isenhart, 1994, Busby and Parker, 1997; Dermen, Koutsy, Connors, & Czarnecki, 1997, Maisto, Chung, Cornelius, & Martin, 2003). On the other hand, the present findings appear to be inconsistent with other studies that found support for the factor structures of these measures (e.g., Carney & Kivlahan, 1995; DiClemente & Hughes, 1990; Hilburger, 1995; McConnaughy et al., 1989; Mitchell, Francis & Tafrate, 2005). These results are explored in more detail below. In addition to the use of CFA, the results of EFA attempts, which explored a more general factor structure of the two measures, also indicated mixed support for their factorial validity. These findings are also discussed in more detail below.
Discussion

URICA - CFA

Some researchers have found support for the proposed four factors of the URICA, as determined by McConnaughy et al. (1983; Carney & Kivlahan, 1995; DiClemente& Hughes, 1990; Hilburger, 1995; McConnaughy et al., 1989; O’Hare, 1996; Pantalon et al., 2002; Rollnick et al., 1992; Dozois et al., 2004). For instance, in a study examining the four-factor structure of URICA applied to cocaine- and alcohol-dependent participants in a psychotherapy trial, the findings of a CFA replicated the original four-factor structure of the URICA, indicating a good factorial validity of the measure (Pantalon et al., 2002). However, while there is some support documented for the URICA, this is not always the case (e.g., Dozois et al, 2004; Figlie et al., 2005). For example, in a study by Figlie et al. (2005) CFA was used to examine the factorial validity of the URICA in a sample of outpatients with alcohol dependence. Results indicated no support for the original four-factor structure of the measure, even after adjusting the measure by removing multiple items. In this way these findings are similar to those of the present study and collectively, it appears that there is mixed evidence for the URICA's factor structure.

One possible explanation to account for some studies finding support for the factor structure of the URICA while the current study (and others) have not, may have to do with the criteria used to evaluate model fit. For instance, Dozois et al. (2002) used CFA to evaluate adequacy of the factor structure of the URICA, and in doing so, reported a moderate fit of the data to the intended factor structure. Upon closer examination of their results, the interpretation of the model fit as moderate could be viewed as potentially questionable. Specifically, it is typically recommended that researchers use the following indices: the goodness-of-fit index (GFI; with good fit indicated by values > 0.90), the adjusted goodness-of-fit index (AGFI; with
good fit indicated by values > .80), and the root mean square residual (RMS; with good fit indicated by values < 0.10; Osman, Barrios, Aukes, Osman, & Markway, 1993).

In the study by Dozois et al. (2012), however, the conclusion that the URICA had a moderate fit was based on the following: a GFI value of .75, an AGFI value of .71 and a RMS value of .09. When compared with the aforementioned recommendations (Osman et al, 1993), a good fit was only supported in the case of the RMS (and not the other fit indices). Therefore, their interpretation of the model fit as moderate may be problematic when considering the entirety of fit indices (and their values). Indeed, if any values of the above goodness-of-fit indices do not reach the conservative cut-off criteria, the model fit is often rendered unacceptable (Cheung & Rensvold, 2002) – much like was the case with the current findings. In short, the use of more conservative criteria for CFA interpretation (which align with published recommendations) in the current study may help to explain why there was inadequate model fit when others (who use less conservative criteria) report the URICA as having an adequate fit (e.g., Dozois et al., 2012).

URICA - EFA

The findings from the current EFA suggest a five-factor solution for the URICA’s structure, which does not align with the intended four-factor structure of URICA (McConnaughy et al., 1983). Indeed, these findings are inconsistent with a number of studies that found support for the proposed four factors of URICA, as determined by McConnaughy et al. (1983; Carney & Kivlahan, 1995; DiClemente & Hughes, 1990; Hilburger, 1995; McConnaughy et al., 1989; O’Hare, 1996; Rollnick et al., 1992; Dozois et al., 2004). For instance, in a study examining the factor structure of the URICA applied to undergraduate participants who identified as having high anxiety, the findings from a principal component analysis found support for the original
four-factor structure of the URICA (Dozois et al., 2004). Although these studies support the original factor structure of the URICA, it has been noted that many of the studies found relatively weak factor loadings of items onto their corresponding factors, in addition to items sometimes loading on the “wrong” component or factor (Littell & Girvin, 2002). Thus, while there is support for the originally intended factor structure of the URICA, there is reason to believe that there may be some issues with the scale’s factor structure.

Following the above, there are a number of studies that have not found support for the original four-factor structure of the URICA, (e.g., Eckhardt & Utschig, 2007; Elder et al., 1990; Isenhart, 1994; Stern et al., 1987) which is more consistent with the current findings. For example, in a study by Eckhardt and Utschig (2007), an EFA with oblique (promax) rotation was used in the examination of the factor structure of the URICA in a sample of male intimate partner violence perpetrators waiting to begin court-mandated batterer intervention programs. These researchers found no support for the original four-factor structure of the measure. Given these and the present findings, it appears that there is mixed evidence for the URICA’s four-factor structure.

One of the possible reasons for some studies replicating the four-factor structure of the URCIA, while the current findings do not show support for this structure, pertains to differences between the approaches and the populations used to examine the measure’s structure. For example, O’Hare (1996) used principal component analysis to examine the data from a sample of adults who were seeking outpatient treatment for a variety of mental health difficulties at a mental health service centre (i.e., clinical sample), which differs from the current non-clinical sample of young adults with a more narrow focus (i.e., history of NSSI). It is possible that the URICA may have more applicability in clinical populations, as opposed to non-clinical
populations; indeed, a number of researchers have highlighted the utility of URICA in the development of interventions (e.g., motivational interviewing) used with clinical populations, in an attempt to enhance likelihood of treatment response (e.g., Miller & Rollnick, 2002; Westra & Phoenix, 2003).

Furthermore, O'Hare's (1996) study, which found support for the original (intended) four-factor structure of the URICA, used the principal component analysis with orthogonal (varimax) rotation. In comparison, the current study uses the EFA with an oblique (promax) rotation, which allowed for correlation of factors, as is recommended in cases when factor correlation matrix shows correlations around .32 and above, which is the case in the current study (Eckhardt & Utschig, 2007; Tabachnick & Fidell, 2007). Indeed, one would expect that the TTM stages and their corresponding recovery-based attitudes to inter-relate; adding support to this is research demonstrating that the stages are linked and that individuals may progress from one stage to the next and also transition back-and-forth between stages (Prochaska, DiClemente, & Norcross, 1992).

As mentioned previously, there has been a number of studies that found no support for the four-factor structure of the URICA (e.g., Eckhardt & Utschig, 2007; Elder et al., 1990; Isenhart, 1994; Stern et al., 1987). Notably, many of these studies found some of the four factors to be merged, rather than distinct, such that, what would be two factors is actually just one (e.g., Contemplation and Action being combined or Action and Maintenance combined; e.g., Eckhardt & Utschig, 2007; Elder et al., 1990; Isenhart, 1994; Stern et al., 1987). Similarly, the current study also failed to find support for the four-factor model of the URICA via EFA; moreover, the current results did not indicate merging of any of the resultant factors as suggested in previous work (e.g., Eckhardt & Utschig, 2007; Elder et al., 1990; Isenhart, 1994; Stern et al., 1987). As
noted earlier, the current EFA indicated a five-factor solution for the structure of the URICA. Upon closer examination of these factors, some (i.e., Factors I, II, IV, and V) consisted mostly of items from particular factors in terms of how the measure is typically scored (i.e., Maintenence, Action, Precontemplation, and Contemplation, respectively). However, there were a number of cross-loadings for several items across multiple factors, which rendered some individual factors difficult to coherently describe. Indeed, for some of these factors (i.e., Factor III), it is somewhat difficult to discern what the factor assesses.

In summary, the current findings regarding the URICA’s factor structure, when applied to NSSI, show some similarities with the previous studies, particularly the ones that have not found support for the original four-factor structure of the URICA (e.g., Eckhardt & Utschig, 2007; Elder et al., 1990; Isenhart, 1994; Stern et al., 1987). There were a number of differences between the current study and the studies that did find support for the original factor structure of the URICA (e.g., different approaches, populations), which may have been a part of the reason why there was a lack of support found in the current study (e.g., Eckhardt & Utschig, 2007; Tabachnick & Fidell, 2007).

SOCRATES - CFA

Some researchers have found support for the original three-factor structure model for the SOCRATES initially identified by Miller & Tonigan (1996; e.g., Mitchell, Francis, & Tafrate, 2005; Vik, Culbertson, & Sellers, 2000). For instance, in a study examining the three-factor structure of the SOCRATES when applied to college students who reported heavy alcohol consumption habits, the findings of the CFA showed a modest support for the original three-factor structure of the SOCRATES (Vik, Culbertson, & Sellers, 2000). Despite these reports, support for the SOCRATES’ factor structure is not always reported (e.g., Maisto et al., 1999).
For example, a study by Maisto et al. (1999) used CFA in the examination of the factorial validity of the SOCRATES in a sample of “at-risk” drinkers in multiple community primary care clinics. Findings did not support the original three-factor structure of the measure. In this way, much like the URICA, it appears that there is mixed evidence for the factor structure of the SOCRATES.

As was the case with the URICA, one possible explanation to account for there being mixed support for the factor structure of the SOCRATES pertains to the criteria used to evaluate model fit. For instance, Vik, Culbertson, & Sellers (2000) used CFA to evaluate adequacy of the factor structure of the SOCRATES, and in doing so, reported a modest fit of the data to the intended factor structure. After examining their results in more detail, however, the interpretation of the model fit as moderate could be viewed as potentially problematic. Specifically, it is typically recommended that researchers use the following indices: the Comparative Fit Index (CFI) ranging from 0 to 1.00, with 0.90 or higher accepted as standard for a well-fitting model, a chi square to degrees of freedom ratio ([chi square] / df) of less than 2.00, a standardized root-mean-square residual (st. RMSR) of less than 0.05, and a root-mean-square error of approximation (RMSEA) of less than 0.08.; Arbuckle, 1997; Byrne, 1994; Tabachnick & Fidell, 1996).

In their study, Vik et al (2000) concluded that the SOCRATES had a modest fit based on a CFI value of .875, [chi-square] / df value of 2.84, st. RMSR value of .084, and RMSEA value of .109. When compared with the aforementioned recommendations (Arbuckle, 1997; Byrne, 1994; Tabachnick & Fidell, 1996), a good fit was not supported by any of the fit indices. Therefore, this interpretation of the model fit may be problematic when considering the entirety of fit indices (and values). Indeed, if any values of the above goodness-of-fit indices do not reach the
conservative cut-off criteria, the model fit is often rendered unacceptable (Cheung & Rensvold, 2002) – much like was the case with the current findings. In short, the use of more conservative criteria for CFA interpretation (which align with published recommendations) in the current study may help to explain why there was inadequate model fit when others (who use less conservative criteria) report the SOCRATES as having a modest fit (e.g., Vik, Culbertson, & Sellers, 2000).

In summary, the current findings from the CFA did not find a support for the factor structure of SOCRATES, unlike some other studies in the past; however, the differences in these studies (e.g., criteria for interpretation of results) may be contributing to the lack of support of the current findings in the literature (Arbuckle, 1997; Byrne, 1994; Tabachnick & Fidell, 1996; Vik et al., 2000).

**SOCRATES-EFA**

The findings from the current EFA suggest a two-factor solution for the structure of the SOCRATES, which is not in line with the intended three-factor structure of SOCRATES (Miller & Tonigan, 1996). To this end, the current findings appear inconsistent with a few studies that found support for the proposed three factors of the SOCRATES, as determined by Miller and Tonigan (1996; e.g., Mitchell, Francis & Tafrate, 2005). For instance, in a study examining the factor structure of the SOCRATES applied to treatment-seeking U.S. military service members diagnosed with alcohol and/or drug dependence, the findings from a principal component analysis found support for the original three-factor structure of the SOCRATES (Mitchell, Francis & Tafrate, 2005). Despite some evidence supporting the three-factor structure of the SOCRATES, several other researchers have found no support for the three-factors when using EFA (Bertholet et al., 2009; Busby and Parker, 1997; Dermen, Koutsky, Connors, & Czarnecki,
Collectively, these findings cohere with those of the present study. In particular, multiple studies examining the factorial structure of the SOCRATES identified two factors: the first one seemingly capturing the Taking Steps domain (i.e., taking action to change harmful behaviour or to maintain the changes already achieved), and the second capturing the recognition or awareness of the problem behaviour domain (Bertholet et al., 2009; Busby and Parker, 1997; Dermen, Koutsky, Connors, & Czarnecki, 1997; Maisto et al., 1999; Maisto, Chung, Cornelius, & Martin, 2003) – both of which are consistent with what was found in the current study.

**URICA & SOCRATES: Shared issues**

In addition to the issues described above, there are several other possible explanations to account for the lack of coherent factor structure found for the URICA and the SOCRATES in the present study. Upon further examination of the measures and the potential variables that may have contributed to the poor factor structure of the measures, multiple problems have been noted in the literature regarding the construction of the URICA, many of which apply to other TTM scales as well, including the SOCRATES (Littell & Girvin, 2002).

Firstly, the wording of many items on these measures has been criticized as double barrelled, which was also noted in the current study (e.g., "I have been successful in working on my problem with self-injury but I'm not sure I can keep up the effort on my own;" Jefferson, 1991). Specifically, the low standardized factor loadings contribute to the poor factor structure of the measures, and as was reported in the Results section, many items with low standardized factor loadings were found to be double barrelled. Furthermore, it has been noted in the past, that there is an increased likelihood of response sets as a consequence of all items being scored in the same direction, which may be one of the contributing factors accounting for the
poor factor structure of the measures, as it could be a source of bias in participants' responses (Jefferson, 1991).

Another problematic issue mentioned in the literature is the fact that many items use negatives in their wording (e.g., "I'm not the problem one. It doesn't make much sense for me to change my self-injury"). If a respondent wanted to not endorse this item, he/she would have to use a double negative; for many individuals, this may be confusing (Jefferson, 1991). In addition, the URICA and SOCRATES have been noted to have potentially awkward wording for some items (e.g., "It is frustrating, but I feel I might be having a recurrence of my problem with self-injury I thought I had resolved."). This could also potentially contribute to confusion (Jefferson, 1991), and may compromise how people respond, and thus possibly compromise the factor structures of the scales. Additionally, some phrases are not in common use (e.g., "[...] slip back on my problem [...]"), which may negatively influence the psychometric properties (e.g., factorial validity) and quality of the scales (Jefferson, 1991).

Past literature has also reported a considerable overlap between the neighbouring stages of change, or subscales, which is shown in the pattern of correlations among the (neighbouring but also non-neighbouring) subscales (Sutton, 2001). This observation points toward the possibility that these subscales may not be measuring discrete stages of change, or that the items describing the stages may not be sufficiently and qualitatively distinct (e.g., Sutton, 2001). In other words, it is possible that the subscales on these measures are so closely conceptually related, that it may be difficult to draw clear distinctions between them; alternatively, it is possible that the items on these measures are designed in a way that their wording makes them consistent with multiple subscales, which may also obscure the distinctions between the stages. Evidence of this issue was also seen in the current adaptations of the measures, since there were
items on these scales that were loading highly on multiple subscales (e.g., both Recognition, and Taking Steps). Indeed, as mentioned before, some items could potentially be endorsed by people whose attitudes toward recovery are consistent with multiple stages outlined in the measures (e.g., In the case of the Item 15 on SOCRATES: "I know that I have a problem with self-injury," both people who are ambivalent and people who already are taking steps toward recovery could strongly endorse this item). With regards to these concerns, Miller and Tonigan (1996) noted that these measures do not always appear to measure the original stage constructs, but rather the scales of the measures may be better understood as capturing the continuously distributed motivational processes that may underlie stages of change, which may explain the overlaps between stages.

**URICA & SOCRATES for NSSI: Implications**

The TTM provides a useful framework for the process of change and recovery in individuals who are experiencing ambivalence and reluctance to stop a harmful behaviour (Sutton, 2001; Littell & Girvin, 2002), such as NSSI. However, the evidence supporting the factorial validity of the current measures of attitudes toward recovery is inconsistent, as reflected in the review of the previous research (e.g., Carney & Kivlahan, 1995; DiClemente & Hughes 1990; Dozois et al. 2004; Elder et al., 1990; Hilburger, 1995; Isenhart, 1994; McConnaughy et al., 1989; O’Hare, 1996; Rollnick et al., 1992; Stern et al., 1987), as well as in the results of the current study. Consequently, researchers and clinicians who may consider using the URICA or the SOCRATES as a means to assess attitudes toward NSSI recovery should exercise caution, especially if these scales were to be used in similar samples to that of the current study, which was relatively homogenous (i.e., young, white female adults attending university).
Limitations and Future Directions

Among the limitations of the current study is the relative homogeneity of the sample; specifically, most of the sample comprised young, white, female adults attending university. Future research may need to include a more heterogeneous sample of participants in order to explore the degree to which these measures have applicability to other populations. Indeed, these measures have been primarily used with clinical populations of individuals engaging in harmful behaviours other than NSSI (e.g., Miller & Rollnick, 2002; Sutton, 2001; Westra & Phoenix, 2003). To this end, there may be merit in examining the utility of these scales in clinical populations of individuals who self-injure, and thus who may self-injure more frequently or more severely. For instance, researchers may wish to consider using the proposed diagnostic criteria of NSSI Disorder, which were introduced in Section 3 of the most recent Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM–5; American Psychiatric Association, 2013). In addition to this, there is a reason to believe that there may be distinct subgroups of individuals who self-injure varying on the basis of clinical severity. For instance, past research used latent class analysis to identify distinct clinical subgroups within the groups of individuals who engage in NSSI based on different criteria (e.g., suicidal ideation; Hamza & Willoughby, 2013). The process of recovery may differ in these clinical subgroups and it is possible that the measures such as URICA and SOCRATES may differ in the extent of their utility between these groups.

In addition to the above, researchers should consider how different factors may impact the process of NSSI recovery, as outlined by the TTM, and how this may therefore impact the manner by which individuals respond to items on the URICA and the SOCRATES. Examples include people’s reported willingness to undergo treatment (e.g., seeking treatment voluntarily vs. mandated treatment), past treatment experiences (e.g., negative experiences may contribute to
more ambivalent or resistant attitudes toward recovery), and mental health difficulties (e.g., comorbid mental health disorder, suicidal ideation, concurrent substance abuse).

Drawing on what was discussed above, another possible limitation of the current study is the wording of the items on the URICA and the SOCRATES. Specifically, the items were adjusted only with respect to the behaviour they reflected (i.e., NSSI), rather than addressing other potential shortcomings that have been noted in the previous literature (e.g., awkward wording, phrasing that is not commonly used, double-barreled statements); thus, these variables may have influenced how readers understood the items and how they responded. In the future, addressing the potential current shortcomings with respect to item wording (e.g., double-barreled statements) may be needed to determine their possible influence on the factor validity of the measures.

If addressing the abovementioned limitations does not yield a psychometrically sound versions of the URICA and the SOCRATES, and considering the cited literature in which the support for the factor structure of each is mixed (e.g., Carney & Kivlahan, 1995; DiClemente & Hughes, 1990; Dozois et al, 2004; Elder et al., 1990; Stern et al., 1987, Isenhart, 1994, Busby and Parker, 1997), there may be a merit in developing an alternative scale to measure attitudes toward NSSI recovery within the TTM framework. In doing so, it would be prudent to ensure the scale clearly delineates the separate TTM stages, which the current adapted measures did not. This may, in turn, help to improve the factor structure of the scale, and thus its possible usefulness in research and clinical contexts.

In addition to the above, there may be a merit in exploring other aspects of the TTM beyond just attitudes toward recovery. As the model involves a number of different factors, their exploration may help determine how well this model fits with the process of NSSI recovery. For
instance, "processes of change" involved in the TTM are the covert and overt activities which are implemented in the progress through stages of change (Prochaska, 2013). According to Prochaska (2013), these processes help inform intervention programs, and they are described as independent variables that people need to apply to move from stage to stage. These processes involve, for instance, consciousness raising, dramatic relief, self-reevaluation, environmental re-evaluation, and self-liberation (Prochaska, 2013). It may be useful to explore to what extent these processes are manifested in the process of NSSI recovery.

Furthermore, future research should consider other possible frameworks of NSSI recovery beyond the TTM. For instance, one such model describes recovery as a progression through six stages: Moratorium (characterized by denial, confusion, self-protective withdrawal and a sense of loss and hopelessness), Awareness (involves the realization that self-injury is a problem and/or unnecessary, and the first signs of hope for a better life and the possibility of recovery), Preparation (taking stock of strengths and weaknesses regarding recovery, and starting to work on developing recovery skills), Rebuilding (actively working towards a positive identity, setting meaningful goals and taking control of one’s life), Stability (self-injury free for one year or more and unlikely to injure again; may still have thoughts/urges but do not act on them), and Secure (self-injury free for five years or more and highly unlikely to injure again; Morgan, Purington, & Whitlock, 2012). This model is based on a model proposed by Andresen, Caputi, & Oades (2006), which was developed to reflect recovery from serious mental illnesses. It is possible that this model, and potentially other models, may be more suitable to represent the NSSI recovery process, when compared to the TTM.

Finally, the current study focused on examining only the factor structure of the URICA and the SOCRATES; however, there may be a merit in exploring other psychometric properties
of the current measures and in determining if the original subscales for the measures have utility when applied to other NSSI variables. For instance, it may be valuable to examine the internal consistency of the originally intended subscales of these measures, in order to get a better understanding of the psychometric properties of these measures (beyond just their factor structure). Additionally, there may be some utility in exploring how these original subscales correlate with different NSSI features (e.g., NSSI onset, lifetime prevalence) in ways that would align with theory. For example, one might anticipate that more frequent NSSI would correspond with less positive attitudes about NSSI recovery or attitudes that align with earlier TTM stages.

**Conclusions**

The goal of the current study was to examine and evaluate the factorial validity of two scales intended to measure attitudes toward NSSI recovery, namely the URICA and the SOCRATES. After a series of CFAs, the current study failed to find an acceptable factor structure to fit the data for either of the two measures, demonstrating an unacceptable factorial validity of these measures, when applied to the current sample. The current study's EFAs revealed factor structures of the URICA and the SOCRATES that were inconsistent with the original factor structures of these measures (McConnaughy et al. 1983; Miller & Tonigan, 1996), although there is some support for these findings in the literature (e.g., Bertholet et al., 2009; Busby and Parker, 1997; Dermen, Koutsky, Connors, & Czarnecki, 1997; Maisto et al., 1999; Maisto, Chung, Cornelius, & Martin, 2003). As a result, these measures should be interpreted and used with caution, especially in populations similar to the current sample (i.e., young white females attending university). Future research should explore potential reasons that may account for the poor factor validity of the current measures (at least within samples similar to the current
one). Also, there may be a merit in researching best ways of studying and measuring aspects of the TTM and other recovery-based frameworks when applied to NSSI recovery.
References


Table 1
Factor loadings for the URICA items resulting from EFA

<table>
<thead>
<tr>
<th>URICA Item</th>
<th>Factor I</th>
<th>Factor II</th>
<th>Factor III</th>
<th>Factor IV</th>
<th>Factor V</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. It worries me that I might slip back on my self-injury problem I have already changed, so I would like to seek help. (M)</td>
<td>.683</td>
<td>.051</td>
<td>.076</td>
<td>-.129</td>
<td>.033</td>
</tr>
<tr>
<td>9. I have been successful in working on my problem with self-injury but I'm not sure I can keep up the effort on my own. (M)</td>
<td>.709</td>
<td>.181</td>
<td>.059</td>
<td>-.148</td>
<td>-.410</td>
</tr>
<tr>
<td>10. At times my problem with self-injury is difficult, but I'm working on it. (A)</td>
<td>.719</td>
<td>.336</td>
<td>-.149</td>
<td>-.031</td>
<td>-.002</td>
</tr>
<tr>
<td>15. I have a problem with self-injury and I really think I should work at it. (C)</td>
<td>.643</td>
<td>.079</td>
<td>-.057</td>
<td>.071</td>
<td>.254</td>
</tr>
<tr>
<td>16. I'm not following through with what I had already changed as well as I had hoped, and I would like to prevent a relapse of my problem with self-injury. (M)</td>
<td>.667</td>
<td>-.073</td>
<td>.040</td>
<td>.104</td>
<td>.020</td>
</tr>
<tr>
<td>18. I thought once I had resolved my problem with self-injury I would be free of it, but sometimes I still find myself struggling with it. (M)</td>
<td>.810</td>
<td>.105</td>
<td>-.024</td>
<td>-.037</td>
<td>-.050</td>
</tr>
<tr>
<td>19. I wish I had more ideas on how to solve my problem with self-injury. (C)</td>
<td>.534</td>
<td>-.099</td>
<td>.318</td>
<td>.071</td>
<td>.099</td>
</tr>
<tr>
<td>28. It is frustrating, but I feel I might be having a recurrence of my problem with self-injury I thought I had resolved. (M)</td>
<td>.734</td>
<td>-.285</td>
<td>.093</td>
<td>.142</td>
<td>.107</td>
</tr>
<tr>
<td>32. After all I had done to try to change my problem with self-injury, every now and again it comes back to haunt me. (M)</td>
<td>.815</td>
<td>.029</td>
<td>-.024</td>
<td>-.006</td>
<td>.003</td>
</tr>
<tr>
<td>3. I am doing something about my problems with self-injury that had been bothering me. (A)</td>
<td>-.149</td>
<td>.763</td>
<td>.067</td>
<td>.015</td>
<td>.063</td>
</tr>
<tr>
<td>7. I am finally doing some work on my problem with self-injury. (A)</td>
<td>.094</td>
<td>.861</td>
<td>-.125</td>
<td>.035</td>
<td>-.043</td>
</tr>
<tr>
<td>14. I am really working hard to change my self-injuring habits. (A)</td>
<td>.108</td>
<td>.859</td>
<td>-.088</td>
<td>.002</td>
<td>-.007</td>
</tr>
<tr>
<td>17. Even though I'm not always successful in changing, I am at least working on my problem with self-injury. (A)</td>
<td>.292</td>
<td>.661</td>
<td>-.111</td>
<td>.078</td>
<td>.028</td>
</tr>
<tr>
<td>25. Anyone can talk about changing; I'm actually doing something about it. (A)</td>
<td>-.259</td>
<td>.858</td>
<td>.125</td>
<td>.055</td>
<td>.005</td>
</tr>
<tr>
<td>27. I would like to prevent myself from having a relapse of my problem with self-injury. (M)</td>
<td>.122</td>
<td>.588</td>
<td>.153</td>
<td>-.041</td>
<td>.027</td>
</tr>
<tr>
<td>30. I am actively working on my problem with self-injury. (A)</td>
<td>-.023</td>
<td>.832</td>
<td>.079</td>
<td>.008</td>
<td>-.023</td>
</tr>
<tr>
<td>1. As far as I'm concerned, I don't have any problems with self-injury that need changing. (P)</td>
<td>-.512</td>
<td>.210</td>
<td>.276</td>
<td>.021</td>
<td>-.565</td>
</tr>
<tr>
<td>12. I'm hoping that seeking help will help me to better</td>
<td>.142</td>
<td>.259</td>
<td>.485</td>
<td>-.085</td>
<td>.100</td>
</tr>
</tbody>
</table>
understand myself. (C)

20. I have started working on my problems with self-injury but I would like help. (A) 

21. Maybe someone will be able to help me. (C)

22. I may need a boost right now to help me maintain the changes I've already made. (M)

24. I hope that there is someone out there who will have some good advice for me. (C)

5. I'm not the problem one. It doesn't make much sense for me to change my self-injury. (P)

11. Seeking help is pretty much a waste of time for me because the problem with self-injury doesn't have to do with me. (P)

13. I guess I have faults, but there's nothing that I really need to change (P)

23. I may be part of the problem with self-injury, but I don't really think I am. (P)

26. All this talk about psychology is boring. Why can't people just forget about their self-injury? (P)

29. I have worries but so does the next person. Why spend time thinking about them? (P)

31. I would rather cope with my faults than try to change them. (P)

2. I think I might be ready for some self-improvement. (C)

4. It might be worthwhile to work on my problem with self-injury. (C)

8. I've been thinking that I might want to change something about myself. (C)

Note. URICA = University of Rhode Island Change Assessment Scale. The subscales of URICA include: M = maintenance, A = action, C = contemplation, P = precontemplation.
Table 2
Factor loadings for the SOCRATES items resulting from EFA

<table>
<thead>
<tr>
<th>SOCRATES Item</th>
<th>Factor I</th>
<th>Factor II</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Sometimes I wonder if I'm a self-injurer. (A)</td>
<td>.435</td>
<td>-.008</td>
</tr>
<tr>
<td>3. If I don't change my self-injuring habit soon, my problems are going to</td>
<td>.706</td>
<td>.043</td>
</tr>
<tr>
<td>get worse. (R)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Sometimes I wonder if my self-injury is hurting other people. (A)</td>
<td>.458</td>
<td>.314</td>
</tr>
<tr>
<td>7. I have a problem with self-injury. (R)</td>
<td>.867</td>
<td>-.039</td>
</tr>
<tr>
<td>10. I have a serious problem with self-injury. (R)</td>
<td>.891</td>
<td>-.156</td>
</tr>
<tr>
<td>11. Sometimes I wonder if I am in control of my self-injury. (A)</td>
<td>.721</td>
<td>.037</td>
</tr>
<tr>
<td>12. My self-injury is causing a lot of harm. (R)</td>
<td>.848</td>
<td>-.091</td>
</tr>
<tr>
<td>15. I know that I have a problem with self-injury. (R)</td>
<td>.766</td>
<td>.180</td>
</tr>
<tr>
<td>16. There are times when I wonder if I self-injure too much. (A)</td>
<td>.793</td>
<td>-.101</td>
</tr>
<tr>
<td>17. I am a self-injurer. (R)</td>
<td>.811</td>
<td>.008</td>
</tr>
<tr>
<td>1. I really want to make changes in my self-injuring habits. (R)</td>
<td>.335</td>
<td>.504</td>
</tr>
<tr>
<td>4. I have already started making some changes in my self-injuring habits. (TS)</td>
<td>-.150</td>
<td>.927</td>
</tr>
<tr>
<td>5. I was self-injuring too much at one time, but I’ve managed to change that.</td>
<td>.128</td>
<td>.545</td>
</tr>
<tr>
<td>(TS)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. I am not just thinking about changing my self-injuring habit, I am</td>
<td>-.241</td>
<td>.941</td>
</tr>
<tr>
<td>already doing something about it. (TS)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. I have already changed my self-injuring habit, and I am looking for ways</td>
<td>-.143</td>
<td>.820</td>
</tr>
<tr>
<td>to keep from slipping back to my old pattern. (TS)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. I am actively doing things now to cut down on or stop my self-injuring</td>
<td>.012</td>
<td>.808</td>
</tr>
<tr>
<td>habits. (TS)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. I want help to keep from going back to the self-injuring problems that</td>
<td>.310</td>
<td>.502</td>
</tr>
<tr>
<td>I had before. (TS)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. I am working hard to change my self-injuring habit. (TS)</td>
<td>.041</td>
<td>.779</td>
</tr>
<tr>
<td>19. I have made some changes in my self-injuring habit, and I want some help</td>
<td>.273</td>
<td>.526</td>
</tr>
<tr>
<td>to keep from going back to the way I used to self-injure. (TS)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. SOCRATES = Stages of Change Readiness and Treatment Eagerness Scale. The subscales of SOCRATES include: R = Recognition, A = ambivalence, TS = taking steps.
APPENDIX A

Demographic Information Questionnaire

Age: ________ (years)

Gender:

[ ] Female
[ ] Male
[ ] Transgender Female
[ ] Transgender Male
[ ] Gender Questioning
[ ] Other: ___________

Ethnicity:

[ ] Aboriginal, First Nations, or Métis
[ ] Arab
[ ] Asian
[ ] Black
[ ] Caribbean
[ ] European, White, or Caucasian
[ ] Latin, Central, or South America
[ ] Pacific Islanders
[ ] Multiracial (please specify):______________
[ ] Other (please specify): ________________

Have you ever sought help or been treated for a mental health problem?

[ ] Yes, I am currently being treated for a mental health problem
[ ] Yes, I have sought help for a mental health problem in the past
[ ] No, I have never been treated for a mental health problem

Have you ever sought help or been treated for non-suicidal self-injury?

[ ] Yes, I am currently being treated for non-suicidal self-injury
[ ] Yes, I have sought help for non-suicidal self-injury in the past
[ ] No, I have never been treated for non-suicidal self-injury
APPENDIX B

Inventory of Statements About Self-Injury (ISAS)

INVENTORY OF STATEMENTS ABOUT SELF-INJURY (ISAS) – SECTION I. BEHAVIORS

This questionnaire asks about a variety of self-harm behaviours. Please only endorse a behaviour if you have done it intentionally (i.e., on purpose) and without suicidal intent (i.e., not for suicidal reasons).

1. Please estimate the number of times in your life you have intentionally (i.e., on purpose) performed each type of non-suicidal self-harm (e.g., 0, 10, 100, 500):

<table>
<thead>
<tr>
<th>Behaviour</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cutting</td>
<td>_____</td>
</tr>
<tr>
<td>Severe Scratching</td>
<td>_____</td>
</tr>
<tr>
<td>Biting</td>
<td>_____</td>
</tr>
<tr>
<td>Banging or Hitting Self</td>
<td>_____</td>
</tr>
<tr>
<td>Burning</td>
<td>_____</td>
</tr>
<tr>
<td>Interfering w/ Wound Healing (e.g., picking scabs)</td>
<td>_____</td>
</tr>
<tr>
<td>Carving</td>
<td>_____</td>
</tr>
<tr>
<td>Rubbing Skin Against Rough Surface</td>
<td>_____</td>
</tr>
<tr>
<td>Pinching</td>
<td>_____</td>
</tr>
<tr>
<td>Sticking Self w/ Needles</td>
<td>_____</td>
</tr>
<tr>
<td>Pulling Hair</td>
<td>_____</td>
</tr>
<tr>
<td>Swallowing Dangerous Substances</td>
<td>_____</td>
</tr>
<tr>
<td>Other</td>
<td>______</td>
</tr>
</tbody>
</table>

53
INSTRUCTIONS: Each statement describes how a person might feel when starting therapy or approaching problems in their lives. Please indicate the extent to which you tend to agree or disagree with each statement. In each case, make your choice in terms of how you feel right now, not what you have felt in the past or would like to feel. All statements refer to non-suicidal self-injury. Please read the following statements carefully. For each statement, circle the number that best describes how much you agree or disagree with each statement.

There are FIVE possible responses to each of the items in the questionnaire:

1 = Strongly Disagree  2 = Disagree  
3 = Undecided    4 = Agree  
5 = Strongly Agree

<table>
<thead>
<tr>
<th></th>
<th>Statement</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>As far as I'm concerned, I don't have any problems with self-injury that need changing.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>I think I might be ready for some self-improvement.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>I am doing something about the problems with self-injury that had been bothering me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>It might be worthwhile to work on my problem with self-injury.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>I'm not the problem one. It doesn't make much sense for me to change my self-injury.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>It worries me that I might slip back on my self-injury problem I have already changed, so I would like to seek help.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>I am finally doing some work on my problem with self-injury.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>I've been thinking that I might want to change something about myself.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9</td>
<td>I have been successful in working on my problem with self-injury but I'm not sure I can keep up the effort on my own.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10</td>
<td>At times my problem with self-injury is difficult, but I'm working on it.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11</td>
<td>Seeking help is pretty much a waste of time for me because the problem with self-injury doesn't have to do with me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12</td>
<td>I'm hoping that seeking help will help me to better understand myself.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13</td>
<td>I guess I have faults, but there's nothing that I really need to change.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14</td>
<td>I am really working hard to change my self-injuring habits.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>15</td>
<td>I have a problem with self-injury and I really think I should work at it.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>16</td>
<td>I'm not following through with what I had already changed as well as I had hoped, and I would like to prevent a relapse of the problem with self-injury.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>17</td>
<td>Even though I'm not always successful in changing, I am at least working on my problem with self-injury.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>18</td>
<td>I thought once I had resolved my problem with self-injury I would be free of it, but sometimes I still find myself struggling with it.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>19</td>
<td>I wish I had more ideas on how to solve the problem with self-injury.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>20</td>
<td>I have started working on my problems with self-injury but I would like help.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>21</td>
<td>Maybe someone will be able to help me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Precontemplation items</td>
<td>Contemplation items</td>
<td>Action items</td>
<td>Maintenance items</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>------------------------</td>
<td>---------------------</td>
<td>-------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>22</td>
<td>I may need a boost right now to help me maintain the changes I've already made.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>23</td>
<td>I may be part of the problem with self-injury, but I don't really think I am.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>24</td>
<td>I hope that there is someone out there who will have some good advice for me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>25</td>
<td>Anyone can talk about changing; I'm actually doing something about it.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>26</td>
<td>All this talk about psychology is boring. Why can't people just forget about their self-injury?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>27</td>
<td>I would like to prevent myself from having a relapse of my problem with self-injury.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>28</td>
<td>It is frustrating, but I feel I might be having a recurrence of my problem with self-injury I thought I had resolved.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>29</td>
<td>I have worries but so does the next person. Why spend time thinking about them?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>30</td>
<td>I am actively working on my problem with self-injury.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>31</td>
<td>I would rather cope with my faults than try to change them.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>32</td>
<td>After all I had done to try to change my problem with self-injury, every now and again it comes back to haunt me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
APPENDIX D

The Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES)

Personal Drug Use Questionnaire
(SOCRATES 8D)

INSTRUCTIONS: Please read the following statements carefully. Each one describes a way that you might (or might not) feel *about your drug use*. For each statement, circle one number from 1 to 5, to indicate how much you agree or disagree with it *right now*. Please circle one and only one number for every statement.

<table>
<thead>
<tr>
<th>Statement</th>
<th>NO! Strongly Disagree</th>
<th>No Disagree</th>
<th>? Undecided or Unsure</th>
<th>Yes Agree</th>
<th>YES! Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I really want to make changes in my self-injuring habits.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. Sometimes I wonder if I am a self-injurer</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. If I don't change my self-injuring habit soon, my problems are going to get worse.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. I have already started making some changes in my self-injuring habits.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. I was self-injuring too much at one time, but I've managed to change that.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. Sometimes I wonder if my self-injury is hurting other people.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. I have a problem with self-injury.</td>
<td>1</td>
<td>2</td>
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<td>5</td>
</tr>
<tr>
<td>8. I'm not just thinking about changing my self-injuring habit, I'm already doing something about it</td>
<td>1</td>
<td>2</td>
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<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. I have already changed my self-injuring habit, and I am looking for ways to keep from slipping back to my old pattern.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. I have serious problems with self-injury.</td>
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</tr>
<tr>
<td>11. Sometimes I wonder if I am in control of my self-injury.</td>
<td>NO! Strongly Disagree</td>
<td>No Disagree</td>
<td>Undecided or Unsure</td>
<td>Yes Agree</td>
<td>YES! Strongly Agree</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12. My self-injury is causing a lot of harm.</td>
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<td>1</td>
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<td>3</td>
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<td>5</td>
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<tr>
<td>13. I am actively doing things now to cut down or stop my self-injuring.</td>
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<td>1</td>
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<td>3</td>
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<td>5</td>
</tr>
<tr>
<td>14. I want help to keep from going back to the self-injuring problems that I had before.</td>
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<td></td>
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<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>15. I know that I have a problem with self-injury.</td>
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<tr>
<td></td>
<td>1</td>
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<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>16. There are times when I wonder if I self-injure too much.</td>
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<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>17. I am a self-injurer.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>18. I am working hard to change my self-injuring habit.</td>
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<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>19. I have made some changes in my self-injuring habit, and I want some help to keep from going back to the way I used to self-injure.</td>
<td></td>
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<tr>
<td></td>
<td>1</td>
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<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>