



A longitudinal investigation of the relation between nonsuicidal self-injury and spirituality/religiosity



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ABSTRACT

Despite increased research on factors that predict engagement in nonsuicidal self-injury (NSSI), one factor that has been neglected is spirituality/religiosity. While some researchers suggest that spiritual/religious beliefs and practice may protect against aversive mental health outcomes, it also is possible that certain aspects of spirituality/religiosity - specifically doubt and questioning - may be distressing. In this study, we examined whether multiple dimensions of spirituality/religiosity, including the often-overlooked experience of doubt/questioning, were associated with engagement in NSSI among university students over time. Participants included 1,132 (70.5% female) first-year undergraduate students (Mean age=19.06, $SD=1.05$) from a Canadian university who were surveyed first in their freshman year, and again one year later. Auto-regressive cross-lagged analyses revealed a bidirectional relation between doubt/questioning and NSSI, where higher doubt/questioning predicted increased NSSI over time (after controlling for baseline depressive symptoms), and vice versa. There were no longitudinal associations between general spirituality/religiosity (i.e., general beliefs/practice) and NSSI. Our findings suggest questioning and doubt may be distressing for some individuals, and predict increased risk for NSSI as a form of coping. Further, higher NSSI may predict increases in questioning/doubt over time. However, the hypothesis that general spirituality/religiosity may protect against NSSI, was not supported.

1. Introduction

Nonsuicidal self-injury (NSSI)¹, which refers to the direct and deliberate destruction of bodily tissue (American Psychiatric Association, 2013), is a widespread mental health concern, particularly among university students. Recent estimates suggest that as many as 38% of young adults report lifetime histories of NSSI (Gratz et al., 2002; Hamza et al., 2013), and as many as 15–19% of students self-injure during the university years (Mental Health Commission of Canada, 2015). Despite increased research on risk factors for NSSI engagement in recent years, one widely neglected factor that may be associated with NSSI engagement is an individual's spirituality/religiosity (i.e., beliefs in the sacred/higher power and involvement in religious organizations). Although spirituality/religiosity may serve as a protective factor for aversive mental health outcomes (Hackney and Sanders, 2003; Ano and Vasconcelles, 2005), certain aspects, such as religious/spiritual questioning or doubt, may be associated with psychosocial distress (Ano and Vasconcelles, 2005; Krause, 2008).

Little research, however, has been conducted examining how different facets of spirituality/religiosity may be linked to NSSI. In the present study we examined bidirectional associations between NSSI and multiple dimensions of spirituality/religiosity, including the often-overlooked experiences of doubt and questioning.

1.1. Predictors of NSSI

Nock (2009) proposed that NSSI occurs when an individual's ability to cope with distress becomes overwhelmed, which often occurs in the context of intrapersonal (e.g., difficulties with emotion regulation, low distress tolerance) and interpersonal difficulties (e.g., poor social problem-solving, lack of social support). As a result, individuals may engage in NSSI to reduce distress and obtain relief from aversive social and emotional experiences (Klonsky et al., 2015). In support of Nock's model, individuals who engage in NSSI report higher emotion dysregulation, depressive symptoms, anxiety (Heath et al., 2008; Martin et al., 2011; Hamza and Willoughby, 2014; Muehlenkamp et al., 2010),

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¹ Nonsuicidal self-injury (NSSI) refers to the direct and deliberate destruction of bodily tissue.

parental criticism, parental alienation, and lack of peer support (Heath et al., 2008; Hamza and Willoughby, 2014; Martin et al., 2011) than their non-injuring peers. Despite increased research on intrapersonal and interpersonal risk factors for NSSI, however, longitudinal examinations on predictors of NSSI engagement are scarce.

1.2. Spirituality/religiosity and NSSI

One factor that has been neglected in the literature on NSSI is an individual's spirituality/religiosity. Spirituality is often defined as the search for the sacred, divine, or nonmaterial aspects of life, and religiosity as behaviors and beliefs associated with organized religion (Zinnbauer et al., 1997). Despite their differences, the two constructs are moderately to strongly correlated (e.g., Kelley and Miller, 2007; McCullough and Willoughby, 2009, p. 74), and organized religion is a common means by which spirituality is facilitated (Smith and Denton, 2005). Rather than define spirituality and religiosity as completely unique constructs, therefore, Good and Willoughby (2014) suggested it is useful to conceptualize a general construct of "spirituality/religiosity" that encompasses two dimensions: institutional (i.e., involvement in and attitudes towards religious organizations/traditions) and personal (i.e., feelings toward and behaviors facilitating a connection with the sacred).

Meta-analyses have revealed that certain aspects of institutional and personal spirituality/religiosity positively predict mental health (Smith et al., 2003; Ano and Vasconcelles, 2005²). Although the relation between spirituality/religiosity and NSSI has not been well-researched, some aspects of spiritual/religious beliefs may promote positive coping strategies (e.g., Gall and Guirguis-Younger, 2013), which suggests that individuals who are spiritual/religious may be less likely to engage in NSSI to reduce negative emotions. Indeed, two recent studies found that college students who reported religious affiliations had lower rates of NSSI than those than those who identified as non-religious (Borrill et al., 2011; Kuentzel et al., 2012). Further, in a longitudinal study, Andrews et al. (2014) reported that high school students who considered themselves to be "religious or spiritual" were less likely to report onset of NSSI over the course of one year than those without such identifications. Finally, using a sample of nearly 15,000 college students, Kress et al. (2015) found small but significant negative relationships between NSSI and both importance of spirituality/religion and belief in the afterlife.

While these investigations provide preliminary support for the idea that some aspects of spirituality/religiosity may reduce the risk of NSSI, much remains unknown about the relation between these constructs, for three reasons. First, the domains of spirituality/religiosity that have been assessed in the aforementioned studies were limited (e.g., one-item questions on narrow aspects of the construct such as religious affiliation or importance of religion/spirituality). A more comprehensive understanding of the relation between NSSI and spirituality/religiosity would be gained by assessing multiple aspects of spirituality/religiosity.

Second, researchers have overlooked the fact that some aspects of spirituality/religiosity may be a source of distress (Koenig, 2008) rather than a comfort. A growing body of research, however, has focused on "religious and spiritual struggles," defined as those aspects of a person's spiritual/religious beliefs and behavior that cause distress (Exline, 2013). Three broad categories of struggles are proposed to exist, namely, "divine struggles" (i.e., seeing God in a negative manner, anger at God), "intrapersonal struggles" (i.e., struggles with an inward focus, for example, feelings of moral imperfection or doubting one's beliefs), and "interpersonal struggles" (i.e., struggles involving conflicts with others over spiritual/religious matters). Studies have demon-

strated that struggles in each domain are associated with negative emotional functioning (e.g., Ellison and Lee, 2010). Given that one of the main factors that motivate individuals to engage in NSSI is the experience of negative emotions, it is possible that some adolescents use NSSI to regulate distress provoked by spiritual/religious struggles. One study has provided some preliminary evidence that spiritual/religious struggles may be linked to engaging in NSSI for the purpose of regulating negative emotions. Using a sample of 30 adolescents being treated for NSSI, Westers et al. (2014) found that negative religious coping (a type of struggle characterized by maladaptive religious responses to stressors, such as questioning God's love or believing one is being punished by God) predicted greater endorsement of using NSSI to control negative emotions.

Thus, it is possible that spiritual/religious struggles may be a risk factor for NSSI. One type of struggle that may be particularly relevant for university students is the experience of uncertainty, doubt, and questioning of religious/spiritual beliefs (see Hunsberger et al. (1996)). As students undertake the task of identity formation, trying to decide "who I am" and "what I believe" in the domain of spirituality/religiosity may provoke gloomy reflections on topics such as the meaning(lessness) of life, what happens after death, whether or not God exists, and if the religious/spiritual principles they were (or were not) taught as children are true (Krause and Wulff, 2004). In adult samples, Krause (2008), Krause and Wulff (2004) found that religious doubt was associated with higher depressive affect, and lower satisfaction with health, self-esteem, life satisfaction, and optimism. In this paper, therefore, we focus on the specific struggle of doubt and questioning, and assess its association with NSSI.

Finally, the body of literature on the relation between spirituality/religiosity and NSSI is limited because the few studies that have explored this issue have not evaluated the direction of effects. It is critical to ascertain whether prior levels of various aspects of spirituality/religiosity (e.g., personal, institutional, struggles) predict subsequent changes in engagement in NSSI, or, conversely, prior NSSI engagement predicts later changes in domains of individuals' spirituality/religiosity. It may also be that the relation is bidirectional.

The aim of the present study, therefore, is to assess the direction of effects in the relationship between NSSI and multiple dimensions of spirituality/religiosity, including the often-overlooked experience of doubt/questioning, which is part of the more general domain of spiritual/religious struggle. Given the literature reviewed above, we predicted that higher levels of personal and institutional spirituality/religiosity would be associated with a decreased risk for engagement in NSSI over time, but that greater doubt/questioning would be linked with increased risk for NSSI over time. To test our predictions, we used a sample of individuals who were first-year university students at the first assessment point, as it has been suggested that the first few years of post-secondary education may be a particularly important period for the development of one's spiritual/religious beliefs (Barry and Nelson, 2010), as well as the onset of NSSI (Heath et al., 2008; Hamza and Willoughby, 2014). To ensure that any significant longitudinal relations between NSSI and spirituality/religiosity were not due to third variable effects, we controlled for depression symptoms in first year, as well as age, sex, parental education, and whether a participant was born in Canada.

2. Methods

2.1. Subjects

Subjects were 1,132 (70.5% female) first-year undergraduate students (Mean age=19.06, SD=1.05) from a mid-sized Canadian university who were surveyed first in the Winter term of their freshman year, and then again one year later. In total, 87.5% of the participants were born in Canada. Within this domestic-Canadian group, participants also indicated whether their family belonged to another culture

² These reviews also show that some aspects of spirituality/religiosity may negatively predict mental health, as will be further explored below.

or ethnic background – the most common ethnic groups identified were British (17%), Italian (15%), French (8%), and German (8%), consistent with the broader demographics for the university and the region (Statistics Canada, 2006). The remaining participants were international students (11.8%) who were predominantly from Asia (4%), the European Union (2%), the Caribbean (1%), and Africa (1%). Data on socioeconomic status indicated mean levels of parental education falling between “some college, university or apprenticeship program” and “completed a college/ apprenticeship/ technical diploma.” The overall retention rate of these students from Time 1 to Time 2 was 72% (if including only students who were still registered at the university at Time 2, the retention rate was 80%).

2.2. Procedure

First-year students from a variety of academic disciplines were invited to participate in the survey through posters, emails, classroom announcements, website postings, and residence visits. Students who were interested in participating were given a consent form describing the study in detail; those who signed the forms were considered to have granted informed consent and completed the survey. Students were given monetary compensation or course credit for their participation. Only students who completed the first wave were invited to participate again. The University Ethics Board approved the study. Although asking young adults about self-injury does not have iatrogenic effects (Reynolds et al., 2006) or lead to increased distress (Gould et al., 2005), to ensure the safety of our participants a full debriefing was provided at the end of the survey and a list was given of mental health resources and researcher contact information.

2.3. Measures

2.3.1. Nonsuicidal self-injury (NSSI)

Participants completed the Inventory of Statements about Self-Injury (ISAS, Klonsky and Glenn, 2009) at both waves. A list of self-injurious behaviors was provided (e.g., cutting, burning) and participants were asked to indicate how many times they had intentionally engaged in each of the behaviors, without lethal intent, in their lifetime. Participant responses were collapsed into the following six categories to create a normalized continuous measure of NSSI frequency: 0=no incidents, 1=1 incident, 2=2–4 incidents, 3=5–10 incidents, 4=11–50 incidents, 5=51–100 incidents, 6=more than 100 incidents (Heath et al., 2008; Hamza and Willoughby, 2014). The ISAS has been shown to have good reliability and validity (Klonsky and Glenn, 2009).

2.3.2. Spirituality/religiosity

Six variables reflecting three dimensions of spirituality/religiosity (personal, institutional, and doubt/questioning) were developed by the authors for the larger survey and measured at both waves. *Religious activity involvement* was measured with 2 items assessing frequency of involvement in religious services and on-campus religious/spiritual groups, using a 6-point scale [1 (never) to 6 (several times a week)]. *Perceived psychological effects/feelings about one's experiences/connection with the sacred* was measured with eight items from the Spiritual Transcendence Index (reliability and validity demonstrated by Seidlitz et al. (2002)) (e.g., “My spirituality gives me a feeling of fulfillment”; “Even when I experience problems, I can find a spiritual peace inside”), using a 5-point scale [1 (strongly disagree)–5 (strongly agree), $\alpha=0.97$ at both waves]. Four questions assessed frequency of *reading about religion/spirituality* (“How often do you read religious/spiritual Holy Books or other books about religious/spiritual issues?”), *prayer* (“How often do you pray?”), *questioning* (“How often do you wonder about spiritual issues [i.e., life after death, the existence of a higher power, meaning of life, etc.]?”), and *doubt* (“How often do you question or doubt what you were taught as a child/teenager about religion/spirituality?”), using a scale from 1 (never) to 5 (every day).

2.3.3. Covariates

Age, Sex (1=male or 2=female), *parental education* (one item per parent, averaged for participants reporting on both parents; 1=did not finish high school to 6=professional degree) and *whether participants were born in Canada* (“Were you born in Canada?” 1=yes or 2=no) were assessed at Time 1, and were used as covariates in all analyses. *Depressive symptoms* at Time 1 also was included as a covariate, and was measured by the Centre for Epidemiological Depression Scale (Radloff, 1977), which assessed the degree of depressive symptoms individuals experienced over the past two weeks (e.g., “I thought my life had been a failure”) on a scale from 1 (none of the time) to 5 (most of the time). Alphas at Times 1 and 2 were 0.91, and 0.93, respectively.

3. Results

3.1. Missing data analysis

Missing data occurred within each assessment time point because some students did not finish the entire questionnaire (average missing data=3.43%), and because some students did not complete both waves of the survey (26.9%). Participants who completed the survey at only Time 1 reported less religious service attendance at Time 1 than participants who completed both waves ($p=0.02$, $\eta^2=0.005$), and were more likely to be male ($p < 0.001$, $\eta^2=0.02$). Missing data were estimated using the full information maximum likelihood (FIML) method. As all the study measures were included in the primary analyses, the variables associated with missingness (i.e., involvement in religious activities, gender) were used in the FIML estimation process (see Little (2013)), thus avoiding the biased parameter estimates that can occur with pairwise or listwise deletion (Schafer and Graham, 2002).

3.2. Preliminary analyses

Descriptive statistics are presented in Table 1. All measures exhibited acceptable kurtosis and skewness with the exception of involvement in religious activities. Transforming “involvement in religious activities” through the log10 procedure brought the item into acceptable limits. To establish whether the data supported the existence of three factors representing the three dimensions of spirituality/religiosity proposed in the literature review (institutional, personal, and doubt/questioning), we conducted a principal components analysis (PCA) using SPSS software. In both waves, spirituality/religiosity variables were entered into a PCA with oblique (oblimin) rotation. Two components emerged at each wave (eigenvalues > 1 , see Table 2). The first component represented a factor encompassing both institutional and personal dimensions (loadings over 0.7 for religious activity involvement, the Spiritual Transcendence Index, prayer, and reading about spirituality/religiosity), while the second component represented a “doubt/questioning” factor (loadings over 0.7 for the items assessing wondering about spiritual issues, and doubting what s/he was told about religion/spirituality as a child/teenager). Therefore, two variables were created for the main analyses: “General Spirituality/Religiosity,” which was the average of participants’ standardized scores on religious activity involvement, STI, prayer, and reading about spirituality/religiosity; and “doubt/questioning,” which was the average standardized scores on wondering and doubt.

We also examined frequency of NSSI at each wave. The percentage of participants who reported lifetime use of NSSI at Time 1 was 38.96% ($N=441$) and at Time 2 was 43.99% ($N=498$), indicating that 5% of participants endorsed NSSI for the first time at Time 2. These rates are similar to other studies using university populations (Gratz et al., 2002; Glenn and Klonsky, 2011).

Table 1
Descriptive statistics.

Dimension	Variable	Range	Time 1 M (SD)	Time 2 M (SD)
Institutional	Attendance at religious activities	1–6	1.43 (0.93)	1.50 (0.93)
Personal	“How often do you read religious/spiritual books?”	1–5	1.58 (0.95)	1.55 (0.96)
	“How often do you pray?”	1–5	2.29 (1.31)	2.21 (1.31)
Doubt and Questioning	Spiritual Transcendence Index	1–5	2.49 (1.12)	2.44 (1.11)
	“How often do you question or doubt what you were taught as a child/teenager about religion/spirituality?”	1–5	2.36 (1.20)	2.32 (1.20)
	“How often do you wonder about spiritual issues (i.e., life after death, existence of a higher power, meaning of life, etc)?”	1–5	2.80 (1.10)	2.61 (1.10)
Non-Suicidal Self-Injury	Lifetime Frequency of NSSI	0–6	1.40 (1.95)	1.67 (2.07)
Depression	Depressive symptoms	1–5	2.11 (0.65)	n/a
Age	Age	17–25	19.06 (0.93)	n/a
Parental education	Highest level of education completed by mother	1–7	3.82 (1.57)	n/a
	Highest level of education completed by father	1–7	3.82 (1.73)	n/a
Gender	“What is your gender?”	1–2	1.71 (0.32)	n/a
Born in Canada	“Were you born in Canada?”	1–2	1.12 (0.46)	n/a

3.3. Primary analyses

The direction of effects in the relation between spirituality/religiosity and NSSI were assessed using auto-regressive cross-lag path analyses in MPlus 7. These analyses estimate reciprocal cross-lag parameters, which test whether a variable assessed at one point in time predicts another variable assessed at a later point in time, after controlling for the over-time stability in the variable being predicted (i.e., time 1 variables are covariates; Little et al., 2009). The model was comprised of three variables measured over two years (NSSI, General Spirituality/Religiosity, and Doubt/Questioning), as well as the covariates measured at time 1 (depressive symptoms, age, sex, born in Canada). Across the time periods we included cross-lag paths between NSSI and General Spirituality/Religiosity, NSSI and Doubt/Questioning, and General Spirituality/Religiosity and Doubt/Questioning; autoregressive paths (i.e., within variable) for NSSI, General Spirituality/Religiosity, and Doubt/Questioning; and concurrent associations between NSSI, General Spirituality/Religiosity, and Doubt/Questioning within each wave. Correlations were specified among the study variables at Time 1 and the covariates (other than between age and sex, as a significant correlation was not expected). Paths also were estimated among the covariates and the study variables at Time 2. Any significant paths, therefore, accounted for the correlations among the variables within a wave and controlled for previous scores on the outcome variables, covariates, and other predictors in the model (i.e., to allow for the estimation of the unique relation among study variables).

The model was saturated, thus, global fit statistics were not available. Results (see Fig. 1) revealed that the relation between NSSI and Doubt/Questioning was bidirectional, as the cross-lag path between doubt/questioning at Time 1 and NSSI at time 2 was significant,

as was the cross-lag path between NSSI at Time 1 and Doubt/questioning at Time 2. Thus, higher doubt/questioning at time 1 predicted increases in NSSI between Time 1 and 2, and vice versa. The cross-lag paths between NSSI and General Spirituality/Religiosity were not significant. General Spirituality/Religiosity predicted increases in doubt/questioning, but doubt/questioning did not predict change in General Spirituality/Religiosity.

4. Discussion

Despite increased research on predictors of NSSI, one factor that has been overlooked is spirituality/religiosity. This study sought to test the longitudinal bidirectional associations between NSSI and multiple dimensions of spirituality/religiosity, including institutional and personal spirituality/religiosity, as well as the often neglected dimension of doubt/questioning. Inconsistent with our predictions, personal/institutional spirituality/religiosity was not associated with decreased risk for NSSI. Consistent with our predictions, however, results revealed a link between greater doubt/questioning and higher engagement in NSSI over time. Although causal inferences cannot be made from this non-randomized study, it is important to note that doubt/questioning was associated with NSSI over and above depressive symptoms, suggesting that depression is not a “third variable” driving the link between doubt/questioning and greater engagement in NSSI.

Our findings suggest that because spiritual struggles in the form of doubt/questioning may foster distress (Krause and Wulff, 2004; Krause, 2008), for some people, NSSI may serve as a coping behavior which regulates the negative emotions caused by doubting/questioning (also see Klonsky and Glenn (2009), Arney et al. (2011), for research on affect regulating functions of NSSI). For some, trying to navigate religious/spiritual beliefs during the transitional period of university

Table 2
Factor loadings for principal components analysis.

Spirituality/Religiosity Dimension	Variable	Time 1		Time 2	
		Loading Factor 1	Loading Factor 2	Loading Factor 1	Loading Factor 2
Institutional	Religious activity attendance	0.82	−0.12	0.84	0.12
	“How often do you read religious/spiritual books?”	0.83	0.04	0.83	0.23
Personal	“How often do you pray?”	0.84	0.02	0.86	0.21
	Spiritual Transcendence Index	0.82	0.09	0.86	0.23
	“How often do you question or doubt what you were taught as a child/teenager about religion/spirituality?”	−0.15	0.90	0.06	0.89
Doubt and Questioning	“How often do you wonder about spiritual issues (i.e., life after death, existence of a higher power, meaning of life, etc)?”	0.24	0.75	0.45	0.81

Note. Factor loadings > 0.50 are in boldface.

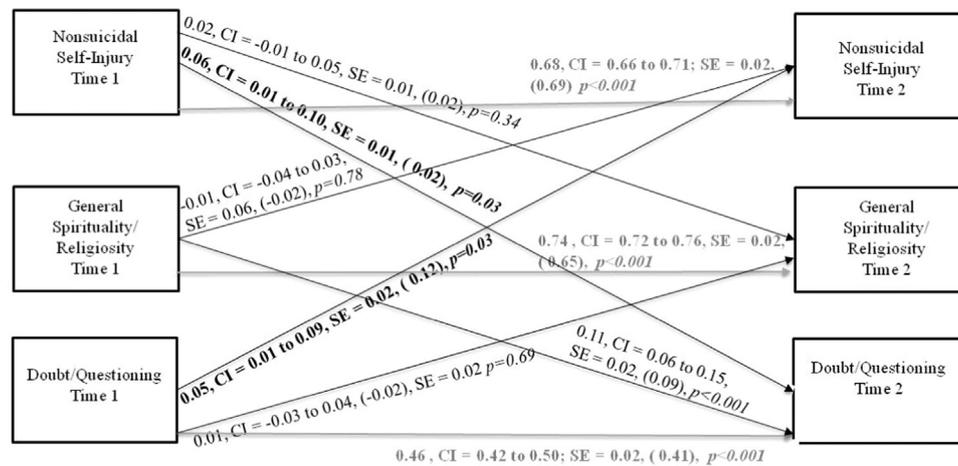


Fig. 1. Paths between nonsuicidal self injury and spirituality/religiosity. Standardized coefficients are reported. SE=standard error, (unstandardized coefficients in brackets). To facilitate interpretation, the covariates (age, gender, parental education, whether participant was born in Canada, and depressive symptoms) are not drawn.

may be stressful, and thus increase their risk for engaging in maladaptive coping behaviors such as NSSI. Such an interpretation is consistent with longitudinal work by Pirutinsky et al. (2011), who found that negative religious coping predicted increases in depression across time in a sample of 80 Orthodox Jews.

Our results, however, also suggested the direction of effects in the relation between NSSI and doubt/questioning may be bidirectional. That is, it also may be that engaging in NSSI prompts individuals to question/doubt their beliefs. This could be because the act of NSSI conflicts with beliefs (e.g., not defacing one's body, which is thought to be the temple of God). Similarly, NSSI may lead to feelings of guilt (Arney et al., 2011) that may cause worry about spiritual/religious values. Another possible mediating factor in the relation between NSSI and subsequent questions/doubts may be anger at God. Research has shown that anger towards God is a common response to negative life events (e.g., illness, bereavement, personal failure, etc; Exline et al., 2011), and this anger might prompt religious doubts (Exline, 2013, p. 467). Thus, it may be that engagement in NSSI is a negative event that causes anger towards God, which may then foster doubt.

The bidirectional results imply that, with regard to the relationship between religious struggles and NSSI, what Pargament and Lomax (2013) refer to as a “complex” model may be in operation, whereby psychological disturbance is both preceded by, and follows, struggles. Pargament and Lomax distinguish the complex model from a primary model (where psychiatric symptoms follow struggles) and a secondary one (where struggles are promoted by psychiatric problems). They also state that it is important for clinicians to keep these distinctions in mind when assessing struggles and psychiatric problems that seem to co-occur.

It is important to note that while our measure of questioning/doubt was linked to mental health problems in the form of increased NSSI risk, some research has found the experience of doubting/questioning is not always linked to negative outcomes. For example, the “quest” religious orientation (an approach to faith that embraces existential questioning as part of the journey; Batson and Schoenrade, 1991) is associated with some indicators of growth and well-being such as forgiveness (Messay et al., 2012), compassion (Batson et al., 2001) and positive coping strategies (Maltby and Day, 2003). It may be that when doubting occurs in the context of a Quest orientation, it may be benign or even beneficial. Future research might consider examining whether quest orientation moderates the relation between doubt/questioning and NSSI.

Given the large body of literature that has found positive associations between spirituality/religiosity and mental health, as well as the few studies that have specifically linked higher spirituality/religiosity to lower risk for NSSI (e.g., Kress et al., 2015), it was surprising that we

did not find an association between higher “general” spirituality/religiosity and decreased risk for NSSI over time. Interestingly, general spirituality/religiosity may have been indirectly linked to *greater* NSSI in our sample, via its longitudinal relationship with increased doubt/questioning (i.e., higher prior spirituality/religiosity predicted increases in doubt/questioning over time). Our findings for this sample were consistent with other research we have conducted with high school students in this community, where we observed that spirituality/religiosity did not predict well-being over time (e.g., Good et al., 2009). However, our study – unlike many previous studies on religion and mental health – was comprised of Canadian university students. This is an important difference because there is evidence spirituality/religiosity is more strongly associated with positive adjustment in cultures where religiosity is highly valued (Gebauer et al., 2012, 2016), and in Canadian culture, religiosity is not [for example, Gebauer et al. (2016) reported Canadians ranked 46th out of 65 countries on the question “I see myself as someone who is very religious”. In contrast, the U.S. ranked 26th]. The results generated from our sample imply that spiritual/religious beliefs may not be as strong of a protective factor for mental health amongst university students in this particular highly secular population as they may be in other populations where religiosity is more culturally valued.

Despite the strengths of our study, including the use of a large-scale longitudinal research design, it is not without limitations. First, our study consisted primarily of Caucasian university students, and may not be generalizable to non-student populations or more ethnically diverse groups. In addition, NSSI is more common among clinical samples and thus the association between NSSI and doubt/questioning may be more pronounced in these samples. Despite our use of a longitudinal design, it still is possible that other “third variables” that we did not measure may account for the link between NSSI and doubt/questioning. We did, however, control for participant age, sex, SES, birth location and depressive symptoms, and still found that the effect was significant over time. Also, participants were asked to self-report past NSSI experiences, which could have resulted in recall errors. Finally, given that standardized path coefficients of 0.10 are typically seen as small effects in the social sciences, the coefficients that were significant in the present study were all small in magnitude. However, small effect sizes are common (even in U.S. samples exploring the relationship between spirituality/religiosity and adjustment), particularly in cross-lagged models with high stability coefficients between adjacent waves of data. We also highlight the fact that such a conservative cross-lagged model was a strength of the study (i.e., controlling for previous scores on the outcome variables as well as other predictors and covariates; accounting for associations among all study variables within a wave; and controlling for Time 1 covariates).

In this case, small effects would be expected. However, small effects are not necessarily trivial effects, and the magnitude of effects is consistent with the other studies that have used similar models (e.g., Mason and Windle, 2002). Regardless, our study provides the first longitudinal examination of the link between NSSI and spirituality/religiosity, and suggests that doubt/questioning may be a risk factor for NSSI.

These results imply that it may be beneficial for colleges to address spiritual struggles as part of mental health prevention/intervention programs. This is not to say that clinicians should work to eliminate or even reduce struggles in the form of doubt/questioning, as these experiences are normative (particularly amongst college students) and can promote spiritual growth (e.g., Pargament, 2011). Research on “spiritually-sensitive clinical practice” has pointed out that doubts/questions (and struggles in general) may be less likely to lead to negative outcomes when individuals have the chance to, for example, talk about their struggles, normalize them, broaden their concept of God, clarify their spiritual values, and find meaning in struggles. One study (Dworsky et al., 2013) found preliminary support for the effectiveness of an intervention program based on spiritually-sensitive clinical practice guidelines among a very small sample of college students who were experiencing spiritual/religious struggles. Further research should be conducted on the ways in which these struggles can be framed in such a way that reduces the likelihood that these struggles may lead to negative outcomes such as NSSI. Further, because our results also suggest that people struggling with NSSI may be at increased risk for spiritual/religious struggles, it may be beneficial for clinicians working with these individuals to provide a space in which these struggles and the strategies outlined above can be discussed.

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