

# Religious and Non-religious Activity Engagement as Assets in Promoting Social Ties Throughout University: The Role of Emotion Regulation

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**Abstract** Emerging adulthood is a time of many changes. For example, one change that occurs for a subset of emerging adults is leaving home and starting university. Importantly, the creation of social ties can aid in promoting positive adjustment during university. This study investigated whether involvement in religious activities promotes social ties among university students directly and/or indirectly through emotion regulation. Importantly, involvement in religious activities may promote self-regulatory skills, and the ability to effectively regulate emotions can aid in navigating social interactions. To rule out potentially important confounding variables, spirituality and involvement in non-religious clubs were statistically controlled in all analyses. The participants included 1,132 university students (70.5 % female) from a university in Ontario, Canada who were surveyed each year over a period of 3 years. The results indicated that involvement in religious activities *indirectly* predicted more social ties over time through emotion regulation. Spirituality did not predict social ties or emotion regulation. Furthermore, non-religious clubs directly predicted more social ties over time. Thus, although involvement in religious and non-religious activities both predicted more social ties in a university setting over time, the mechanism by which these activities promote social ties differed.

**Keywords** Emerging adulthood · Religiosity · Spirituality · Clubs · Social ties

## Introduction

The core priority in the Positive Youth Development (PYD) framework is the identification of assets that promote competence among young people (Larson et al. 2006). Emerging adulthood (i.e., the stage of life spanning from the late teens to the late-20s; Arnett and Fishel 2013) is a critical period for developing competency in intimate social relationships (Erikson 1968), and thus, it is important for researchers to identify factors that may promote this asset. Religiosity (that is, behaviors associated with formal religious traditions) is one characteristic that has been identified within the PYD framework as a potential asset for successful development (Lerner et al. 2002), but it has not been studied extensively in terms of its role in promoting social ties (i.e., friendships) among emerging adults. The overarching goals of the present study, therefore, were to consider the way in which religiosity may be related to positive social ties, and to consider one possible mechanism—namely, emotion regulation—through which this connection may operate.

## The Importance of Social Ties in Emerging Adulthood

Emerging adulthood is a transitional period during which identity exploration, instability, and a feeling of being “in-between” is common (Arnett 2000). Importantly, this period of life can set the stage for negative and/or positive adjustment in adulthood (Arnett 2007; Erikson 1968). Erikson (1968) suggested that there is a “crisis” during this age period of intimacy versus isolation; in other words,

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emerging adults are faced with the challenge of either creating intimate friendships or failing this task, resulting in isolation. This “crisis” may be especially salient for emerging adults who leave home and start university, as they often are faced with creating *new* social ties (i.e., close friends, romantic relationships) at university that can help protect them from isolation and promote positive adjustment.

Social ties in emerging adulthood can play many roles (e.g., they can operate as role models, provide advice, guidance, and feedback, or listen without judgment) and are influential in forming or aiding in shaping one’s self concept (Tokuno 1986). Among emerging adult populations, having close social ties is associated with better adjustment in terms of more happiness and lower depressive symptoms (Demir 2008; Demir and Weitekamp 2007; Galambos et al. 2006), higher self-esteem and increased well-being (Galambos et al. 2006). One setting in which the creation of social ties may occur, as demonstrated with data from high-school students, is through involvement in religious groups (King and Furrow 2004).

#### Religiosity and the Development of Social Ties

Many studies lend support to the idea that religiosity may promote positive social ties. Although it is widely accepted that there are multiple aspects of the broad construct of “religiosity”, very little consensus exists about what those different aspects may be. In fact, it has been estimated that there are over 200 published measures of various aspects of religiosity (Hill and Edwards 2013), encompassing a wide range of “public” (e.g., participation in formal religious groups) and “private” (e.g., personal religious commitment, sense of connection with the sacred) dimensions. In the current study, our primary focus is on involvement in religious activities.

The experience of being part of a religious congregation may provide individuals with a large group of like-minded peers (as well as younger and older people) from whom they can create a network of friends and mentors. Indeed King and Furrow (2004) reported that religiosity (measured by the importance of being religious/spiritual, frequency of religious activity participation, and the importance of participating in religious activities), is associated with social capital (i.e., a strong, supportive network of relationships or mutual acquaintances; Bourdieu 1986). Furthermore, Smith (2003) found that religion (specifically the relationships formed in the congregation in which one is involved) predicted enhanced social network closure (i.e., the embedding of an individual within a system of interconnected individuals and communities; Coleman 1988) in American youth. Finally, Ellison and George (1994) indicated that a defining characteristic of churches and

religious groups is that they are *based* on being a network of individuals, and those who frequently attend religious services tend to report larger networks and more positive perceptions of their social relationships than those who attend less frequently.

In addition to fostering the creation of larger, more interconnected social networks, some aspects of religious activities may be good for developing strong social ties. For example, Desrosiers et al. (2011) found that when mothers displayed spiritual support for their adolescents (e.g., adolescents were comfortable discussing religious or spiritual issues with their mother), those children were more likely to have friends that offered intimate conversations surrounding spirituality than children whose mothers did not offer spiritual support. Krause (2011) found that older adults who had higher levels of church attendance reported more spiritual support and more intimate friendships both inside and outside of the church context (i.e., with secular friends), which were maintained through informal friendships within the church context. Furthermore, because the relationships created in religious groups often are based on shared beliefs and interests, the friendships may be built on a foundation of trust and support (see Ellison and George 1994).

Very little research has been done examining the specific reasons for which religious activities foster large and supportive social networks. One possible explanation may be that religiosity promotes intrapersonal characteristics that help young people create and maintain friendships. Indeed, Bartkowski et al. (2008) found that parents who attended religious services frequently were more effective at fostering their children’s self-control and social skills than parents who attended religious services less frequently. Bartkowski et al. (2008) hypothesized that these children of religious parents then may internalize these social skills and use these skills in environments other than the home (although this hypothesis was not tested in Bartkowski et al.’s study).

Furthermore, emerging adults and/or adolescents who are religious (i.e., involved in religion, view religion as important, and/or are intrinsically religious) tend to score higher on the Big Five personality characteristics of Agreeableness and Conscientiousness (Taylor and MacDonald 1999; for a review see Saroglou 2002), and they report lower levels of depressive symptoms (Rasic et al. 2013), greater psychological well-being (Good and Willoughby 2006; Milevsky and Levitt 2004), and lower rates of involvement in drugs and risky behaviors (Good and Willoughby 2006; Lefkowitz et al. 2004) than those who are less religious or not religious. Throughout the lifespan, there is evidence that each of these positive intrapersonal traits, while varied, share a common predictor: good self-regulation (Dvorak and Day 2014; Eisenberg et al. 2014;

Horvath and McColl 2013; Uzun Ozer et al. 2014). Self-regulation, which involves exerting control over one's behavior to achieve one's goals or standards (Baumeister and Vohs 2004), is important for promoting pro-social behaviors (e.g., Carlo et al. 2012) and is a crucial component of interpersonal success (see Fitzsimons and Finkel 2011). It may be that good self-regulation, such as emotion regulation, is one path through which religiosity plays a role in promoting positive interpersonal relationships.

### Religiosity and Emotion Regulation

Emerging adulthood is a time during which it is important to develop and refine self-regulatory skills (Arnett 2007; Schulenberg and Zarrett 2006), including in the domain of emotions. Thompson (1994) defines emotion regulation as “the extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotion reactions, especially their intensive and temporal features, to accomplish one's goals” (pp. 27–28). According to the Dual Systems Model (Steinberg 2010), problems with emotion regulation in adolescence and emerging adulthood may be the result of a temporal gap between an early maturing limbic system (leading to increases in emotional reactivity starting in early adolescence) and a slower maturing regulatory system (i.e., led by the prefrontal cortex which is associated with inhibition and regulation) that may not be fully mature until the mid-20s. In other words, the greater maturity of the limbic system in early adolescence is thought to lead to increased emotional reactivity that may challenge the still developing regulatory system, such that the ability to self-regulate emotions is compromised (Spear 2000; Steinberg 2010).

Knowledge of how to regulate emotions can aid in the navigation of social interactions (see Thompson 1994). For example, in a situation during which one becomes angry with a friend, regulating one's response (e.g., monitoring one's words and actions in response to the situation) may aid in maintaining that relationship (see Lopes et al. 2011). Gross and John (2003) found that good emotion regulation (specifically in the form of the ability to reframe, in one's mind, a stressful situation in a positive manner) predicted the ability to share emotions with friends skillfully (i.e., share how one feels with one's friends without directing those emotions at friends).

Researchers have proposed that many aspects of religious practices promote good self-regulation (Koole et al. 2010; McCullough and Willoughby 2009). For example, religious activities such as prayer and confession may aid in monitoring one's behaviors and goals, which promotes self-regulation (Baumeister et al. 2010; McCullough and Carter 2011). Furthermore, frequent engagement in these activities may strengthen the ability to use self-regulation (i.e., self-

control as a muscle; McCullough and Carter 2011). More evidence for a link between religiosity and self-regulation comes from studies that suggest that participating in religious activities can promote short- and long-term goal attainment (Baumeister et al. 2010), and is associated with lower alcohol and drug use in adolescence (Desmond et al. 2013; Walker et al. 2007) and lower impulsive behavior in children of parents who are religious than children of parents who are not religious (Bartkowski et al. 2008). Experimental research also has found that when university students are primed with religious cues such as words like *God*, *spirit*, or *divine*, they demonstrate more temptation resistance (Laurin et al. 2011) and more self-control under cognitively taxing tasks (Rounding et al. 2012) than students who are not primed with religious cues. Religious primes, then, seem to help individuals set and achieve goals.

Much less research has been conducted on the relationship between religiosity and self-regulation in the specific domain of emotion. Some studies, however, suggest that religiosity predicts the ability to monitor and control one's emotions. For example, some people find that turning to religion is an effective coping mechanism (Pargament 1997). Krägeloh et al. (2012) reported that, for highly religious/spiritual individuals, relying on religion during stressful situations was correlated with active coping (e.g., taking action to improve the situation), positive reframing (e.g., trying to see the good in a problem), and acceptance (e.g., learning to live with the situation; Carver 1997). McIntosh et al. (1993) found that among parents who had suddenly lost a child, participating in religious activities was associated with the ability to derive meaning from their loss and with the perception of having more social support, in comparison to parents who had lost a child and participated less frequently in religious activities. Furthermore, placing a high value on religion was associated not only with finding meaning in the loss, but also with the use of cognitive processing strategies (e.g., how often they talked about the death) to help cope with the death. Individuals who perceived themselves as having high social support and those who utilized more cognitive processing to cope with the loss also reported greater well-being 18 months after the loss than individuals who perceived themselves as having lower levels of social support, and those who used less cognitive processing following the loss.

Religiosity also may affect emotion regulation at the neural level. Inzlicht and Tullett (2010) found that participants who believed in God displayed decreased error-related negativity (a neural signal originating in the anterior cingulate cortex that is associated with performance monitoring and affective responses to errors) when presented with non-conscious religious primes (e.g., unscrambling a sentence containing the words *spirit*, *divine*, or *sacred*). The authors suggested that these findings indicate that, for religious people, thinking about religion (even non-

consciously) lowers their anxious response to making mistakes, which over time may allow them to cope better with everyday pressures.

Given the literature reviewed above, it is reasonable to predict that one way in which religiosity (e.g., involvement in religious activities) may help individuals attain and maintain supportive social ties is through the promotion of effective emotion regulation. It is the goal of this article to evaluate this hypothesis. In non-experimental paradigms, cause and effect cannot be ascertained; however, by using longitudinal data where participants are surveyed on the same variables across multiple time points, it is possible to assess the *direction of effects* among these variables. Specifically, the examination of whether higher involvement in religious activities at one time point predicts better emotion regulation at a *later* time point (i.e., “socialization effects”), or whether better *prior* emotion regulation predicts greater *subsequent* involvement in religious activities (i.e., “selection effects”), is possible. With non-experimental data, it also is important to try to rule out the possibility that the links between the variables of interest may be due to common associations with other confounding variables. In the current study, spirituality and involvement in non-religious clubs represent potentially important confounding variables.

#### Accounting for Spirituality and Involvement in Non-religious Clubs: Implications for Prediction of Social Ties and Emotion Regulation from Religiosity

##### *Spirituality*

In examining the relationships among involvement in religious activities, emotion regulation, and social ties, it is crucial to account for shared variance between involvement in religious activities and spirituality. Spirituality often is defined as behaviors and beliefs associated with the search for the sacred (in contrast to behaviors associated with organized religion; see Good et al. 2011). Involvement in religious activities and spirituality are unique but overlapping constructs, as organized religion may provide a venue that facilitates spirituality (e.g., Aldwin et al. 2014; Good and Willoughby 2008; McNamara Barry et al. 2010).

A limited amount of evidence suggests that spirituality and religiosity may indeed differentially predict outcomes related to psychosocial adjustment. Saroglou (2002), for instance, reported that associations between “religion” and personality traits changed depending on the manner in which “religion” was defined and measured. For example, intrinsic-general religiosity (e.g., prayer, private religiosity) was correlated with Agreeableness and Conscientiousness, and more weakly correlated with extraversion and openness, whereas extrinsic religiosity (e.g., involvement in religious

activities for gaining social support and status; Allport and Ross 1967) was positively related to neuroticism. Similarly, Good and Willoughby (2014) found that “personal spirituality/religiosity” uniquely predicted more positive adjustment among adolescents in terms of well-being, parental relationship, and academic orientation, whereas “institutional spirituality/religiosity” (e.g., religious service attendance) uniquely predicted lower substance use.

Not accounting for shared variance between involvement in religious activities and spirituality when assessing their associations with other variables may result in misleading findings. Critically, McCullough and Willoughby (2009) reported that the associations between “spirituality” (i.e., the Self Transcendence Scale, which measures one’s sense of spiritual connection with a higher power and other humans) and self-control changed considerably (from no relationship to a significant negative relationship) after “religiousness” (a composite scale consisting of items such as involvement in religious activities and importance of religion) was partialled out, even though religiousness and spirituality were correlated quite strongly ( $r = .46$ ). It is important, therefore, to account for spirituality in the current study. To our knowledge, no one has examined the unique role of both involvement in religious activities and spirituality in a predictive framework including both emotion regulation and social ties.

##### *Involvement in Non-religious Clubs*

It is possible that the correlation between religious activities and psychosocial adjustment may be confounded by general activity involvement. That is, adolescents who attend religious activities also are more likely to be involved in non-religious structured clubs (Bartko and Eccles 2003; Youniss et al. 1997), and involvement in non-religious clubs is associated robustly with positive adjustment (e.g., Busseri et al. 2006). It is possible, then, that religious activities may predict more social ties in a university setting and/or emotion regulation simply due to the general tendency of individuals who are religiously-involved to be “joiners”, that is, part of many clubs within their communities (Bartko and Eccles 2003; Youniss et al. 1997). If involvement in religious activities and non-religious clubs are not analyzed concurrently, it is not possible to observe the unique role of religious service attendance (i.e., outside of its effects due to being part of a “club”, see Good et al. 2009, for an extensive review).

##### *Demographic Factors*

It also is critical to account for demographic variables (namely, gender, socio-economic status, and whether participants were born in Canada or internationally) to

accurately represent the relations among the main variables of interest. Gender is important to include as a covariate because there have been consistent differences found between boys and girls for rates of attendance at religious services (e.g., Miller and Hoffman 1995). Socio-economic status (SES; specifically in the current study, level of parent education) was included because it also has been associated with attendance and involvement in religious services and clubs (e.g., Beeghley et al. 1981). Finally, whether or not participants were born internationally was necessary to include as research has found that international students rate themselves as more religious/spiritual than domestic students (e.g., Hsu et al. 2009).

### The Current Study

The goal of the present study was to test the longitudinal associations (i.e., the direction of effects) between involvement in religious activities (i.e., service attendance, on-campus religious activities, and reading Holy texts) and both emotion regulation and social ties in a university setting. Given that attending religious activities may promote social ties simply because individuals who frequently attend are part of a strong, supportive network (King and Furrow 2004), it was hypothesized that there may be a direct effect of religious activities on social ties in a university setting. It also was hypothesized that there might be an indirect effect, specifically through the mechanism of emotion regulation, such that more religious activities would predict better emotion regulation over time (Pargament 1997; Watts 2007), and better emotion regulation would predict more social ties over time (Fitzsimons and Finkel 2011; Gross and John 2003). To rule out potential confounding variables, spirituality (i.e., spiritual attitudes/beliefs), involvement in non-religious clubs, and demographic factors (gender, SES, and whether participants were born in Canada or not) were used as covariates, and were controlled for in all analyses. Finally, the potential moderators of gender and being born in Canada were examined.

### Methods

#### Participants

The participants were 1,132 students (70.5 % female) enrolled at a mid-sized university in southern Ontario, Canada, who were assessed for three consecutive years. At the first assessment, all participants were in their first year of university ( $M_{age} = 19.06$  years,  $SD = .93$  years, range 17.8–25.5 years). The data on socioeconomic status

indicated that mean levels of education for mothers and fathers fell between “some college, university, or apprenticeship program” and “completed a college/apprenticeship and/or technical diploma.” The sample was composed predominantly of domestic-Canadian students (88.2 %). Of the international students, the majority were from Asia (35 %), the European Union (16.8 %), Africa (12.4 %) and the Caribbean (10.2 %).

#### Procedure

First-year university students from various academic disciplines were invited to complete a survey examining factors related to stress, coping, and adjustment to university by way of posters, classroom announcements, website posting, and visits to on-campus student residences. The participants were given course credit or monetary compensation (\$10) for their participation at Time 1, and monetary compensation for their participation at Time 2 (\$20) and Time 3 (\$30). At Times 2 and 3, all students who participated in the first assessment were invited to participate again, by way of e-mails, posters, and classroom announcements. At all three assessments, the surveys were completed during the winter term. The study was approved by the University Ethics board prior to survey administration at all three assessments, and all the participants provided informed active consent prior to participation. The survey was administered by trained research assistants.

#### Missing Data Analysis

Missing data occurred within each assessment time point because some students did not finish the entire questionnaire (average missing data = 1.5 %), and because some students did not complete all three waves of the survey. Out of the original sample that completed the study at Time 1, 63.1 % completed the survey in all 3 years, 18.8 % completed it in two of the 3 years (9.98 % in years 1 and 2, 8.83 % in years 1 and 3), and 18.1 % completed it in one of the 3 years. Participants who completed the survey at only one wave reported less involvement in religious activities at Time 1 than participants who completed two waves ( $M_{diff} = -.23$ ) or three waves ( $M_{diff} = -.19$ ),  $F(2, 1,006) = 4.11$ ,  $p = .02$ ,  $\eta^2 = .008$ . Participants who completed the survey at only one wave also reported less involvement in non-religious clubs at Time 1 than participants who completed two waves ( $M_{diff} = -.38$ ) or three waves ( $M_{diff} = -.35$ ),  $F(2, 1,006) = 3.89$ ,  $p = .02$ ,  $\eta^2 = .008$ . Participants who completed the survey at only one wave also reported fewer social ties at Time 1 than participants who completed two waves,  $M_{diff} = -.25$ ,  $F(2, 1,006) = 3.14$ ,  $p = .04$ ,  $\eta^2 = .006$ . Missing data were estimated using the full information maximum likelihood (FIML) estimation

method. As all the study measures were included in the primary analyses, the variables associated with missingness (i.e., involvement in religious and non-religious activities, social ties, and a newly created variable measuring the number of missing waves for each participant) were used in the FIML estimation process (see Little 2013). FIML retains cases that are missing survey waves, thus avoiding the biased parameter estimates that can occur with pairwise or listwise deletion (Schafer and Graham 2002; although note that the overall pattern of results in the primary analysis remained the same when data from *only* participants that had participated at all three time points were analyzed).

Measures

Demographics

Gender (1 = *male* or 2 = *female*), parental education (one item per parent, averaged for participants reporting on both parents, with a scale from 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.

Involvement in Religious Activities

Involvement in religious activities was measured with three items: (1) *reading of religious texts* (“In general, how often do you read religious/spiritual Holy Books or other books about religious/spiritual issues?”); (2) *involvement in religious services* (“Since the start of this academic year, how often have you attended religious services/activities?”); and (3) *involvement in other religious activities* (“Since the start of this academic year, how often have you attended activities held by an on-campus religious/spiritual group?”). For *reading of religious texts*, responses were based on a 5-point Likert scale ranging from 1 (*never*) to 5 [*almost always* (i.e., *every day*)]. For *involvement in religious services* and *involvement in other religious activities*, responses were based on 6-point Likert scales ranging from 1 (*never*) to 6 (*several times a week*). The three items were standardized as they were measured on different scales, and averaged to create a composite variable. Cronbach’s alphas for the standardized composites at Time 1, Time 2, and Time 3 were .80, .81, and .83, respectively. Higher values indicated more religious activity.

To ensure that the involvement in religious activities items differed from the spirituality items, an exploratory factor analysis was conducted. The spirituality and involvement in religious activities variables at Time 1 were entered into a factor analysis with oblique (oblimin) rotation. Two components emerged with Eigenvalues >1. The first component comprised the items included in the

**Table 1** Exploratory factor analysis results (pattern matrix) for the religiosity and spirituality measures using principle components and oblique (oblimin) rotation

Item	Loadings	
	Factor 1	Factor 2
Since the start of this academic year, how often have you done the following: attended activities held by an on-campus religious/spiritual group	.14	<b>.93</b>
Since the start of this academic year, how often have you done the following: attended religious services/activities	-.11	<b>.81</b>
I maintain an inner awareness of God’s presence in my life	<b>.88</b>	-.02
I experience a deep communion with God/higher power	<b>.88</b>	-.06
My spirituality gives me a feeling of fulfillment	<b>.87</b>	.02
Maintaining my spirituality is a priority to me	<b>.91</b>	-.03
Even when I experience problems, I can find a spiritual peace within	<b>.89</b>	.10
I try to strengthen my relationship with God/higher power	<b>.89</b>	-.07
God/higher power helps me to rise above my immediate circumstances	<b>.89</b>	-.06
My spirituality helps me to understand my life’s purpose	<b>.92</b>	.02
In general, how often do you read religious/spiritual Holy Books	-.27	<b>.66</b>
Eigenvalue	7.33	1.32
% of variance	66.62	12.00

The bolded numbers are factor loadings over .60

spirituality measure (Eigenvalue = 7.33) whereas the second component comprised the three “involvement in religious activities” items (Eigenvalue = 1.32). Thus, the PCA offered support for the separation of the involvement in religious activities and spirituality questions (see Table 1 for the factor analysis results).

Spirituality

Spirituality was assessed using eight items from the Spiritual Transcendence Index (Seidlitz et al. 2002; e.g., “I experience a deep communion with God/higher power”). The responses were based on a 5-point Likert scale ranging from 1 (*strongly agree*) to 5 (*strongly disagree*). Cronbach’s alpha was .97 at all waves. The composite scale was reverse scored so that higher values indicated more spirituality.

Involvement in Non-religious Clubs

Involvement in non-religious clubs was assessed by one item: “Since the start of this academic year, how often

have you participated in non-religious school or community clubs that are not sports clubs”. The responses were based on a six-point Likert scale ranging from 1 (*never*) to 6 (*several times a week*). Higher scores indicated more participation in these activities.

#### Difficulty with Emotion Regulation

Difficulty with emotion regulation was assessed using six items from the Difficulties in Emotion Regulation Scale (Gratz and Roemer 2004; e.g., “When I’m upset or stressed, I have difficulty concentrating”). The responses were based on a five-point Likert scale ranging from 1 (*almost never*) to 5 (*almost always*). Cronbach’s alphas at Time 1, Time 2, and Time 3 were .73, .74, and .76, respectively. Higher scores indicated more difficulty with regulating emotion.

#### Social Ties

Social ties were assessed using three items from the Student Adaptation to College Questionnaire (Baker and Siryk 1989; e.g., “I have several close social ties at university”). The responses were based on a five-point Likert scale ranging from 1 (*not at all like me*) to 5 (*completely like me*). Cronbach’s alphas at Time 1, Time 2, and Time 3 were .68, .72, and .76, respectively. Higher scores indicated more social ties.

## Results

### Preliminary Analysis

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 measure into acceptable

range. All analyses, therefore, used the transformed measure for involvement in religious activities (although note that the pattern of results remained the same if the raw scores for involvement in religious activities were used). The descriptive statistics for all study variables were analyzed using SPSS 22 and are listed in Table 2. The religious orientations of the participants are outlined in Table 3. There were significant main effects of gender on difficulty with emotion regulation at all three time periods  $ps \leq .001$ , such that females reported more difficulty with emotion regulation than males. Females also reported more involvement in non-religious clubs than males at Times 1 and 2,  $ps \leq .03$ , but not at Time 3,  $p = .15$ . There was no significant effect of gender on spirituality at Times 1 or 2,  $ps > .05$ , but females reported more spirituality than males at Time 3,  $p = .03$ . There were significant main effects of being born internationally on spirituality and religious activity at all three assessments,  $ps < .001$ , such that students born internationally reported more spirituality and religious activity than students born in Canada. Finally, students born in Canada reported more social ties than students born internationally at Time 1 and Time 2,  $ps < .001$ , but not at Time 3,  $p = .09$ .

### Primary Analyses

The primary statistical analyses were carried out using path analysis in AMOS 20.0. The overall model fit was determined using the comparative fit index (CFI) and the root mean square error of approximation (RMSEA) indicators of goodness-of-fit (Hu and Bentler 1999). The cut-off criteria recommended by Hu and Bentler for a well-specified or close-fitting model are a CFI  $>.95$  and a RMSEA  $<.06$ , simultaneously. An analysis that examined the associations among involvement in religious activities, spirituality, involvement in non-religious clubs, difficulty with emotion

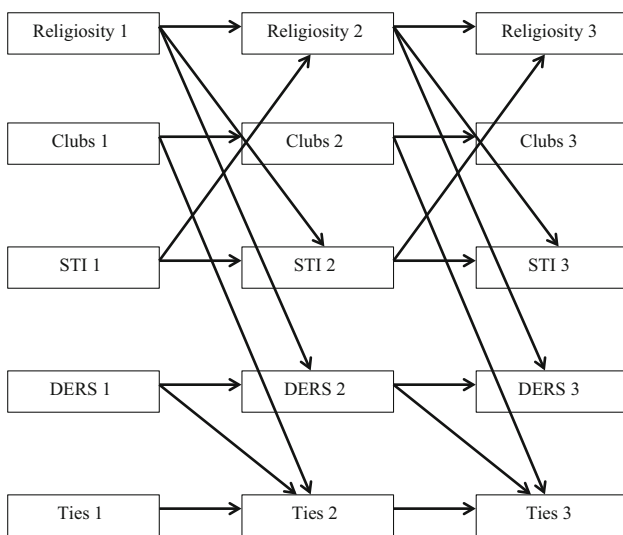
**Table 2** Means and standard deviations for study variables

	Domain	Variables	Time 1 <i>M (SD)</i>	Time 2 <i>M (SD)</i>	Time 3 <i>M (SD)</i>
	Involvement in religious activities	Service attendance	1.63 (1.22)	1.78 (1.27)	1.75 (1.23)
		Club attendance	1.22 (0.85)	1.21 (0.82)	1.20 (0.75)
		Reading religious books	1.58 (0.95)	1.55 (0.96)	1.58 (1.00)
	Club involvement	Non-religious club attendance	1.85 (1.38)	1.83 (1.48)	1.91 (1.52)
Means for religiosity variables are based on unstandardized data	Spirituality	STI	2.49 (1.12)	2.44 (1.11)	2.38 (1.16)
	Emotion regulation	DEERS	2.78 (0.75)	2.85 (0.76)	2.85 (0.76)
	Social ties	Social ties	3.20 (0.91)	3.19 (0.93)	3.23 (0.98)
STI Spiritual Transcendence Index (spirituality), DEERS difficulty with regulating emotions	Covariates	Gender	70.5 % female		
		Parents’ education	3.71 (1.30)		
		Born in Canada	84.9 % born in Canada		

**Table 3** Religious affiliation of participants at Time 1

Religious affiliation	%
Agnostic	4.5
Atheist	6.3
Buddhist	2.0
Catholic	38.6
Hindu	1.5
Judaism	0.5
Muslim	1.7
Native/aboriginal	0.3
None	14.6
Other	4.2
Protestant	25.1
Sikh	0.5

3.9 % of participants did not indicate religious affiliation



**Fig. 1** Significant cross-lagged paths. Results for covariates can be obtained from the first author. Religiosity = religious activities composite, Clubs = involvement in non-religious clubs, STI = Spiritual Transcendence Index (spirituality), DERS = difficulty with regulating emotions, Ties = social ties composite. Numbers 1, 2, and 3 indicate Time 1, Time 2, and Time 3, respectively

regulation and social ties across Times 1, 2 and 3 was conducted—see Fig. 1. Across the three time periods, lag-1 cross-lag paths among all 5 variables, lag-1 and lag-2 autoregressive paths, and concurrent associations among all 5 variables within each wave were included. Gender, parental education, number of missing waves, and whether or not the participant was born in Canada were included as covariates, with correlations specified between the covariates and each variable at Time 1, and paths estimated between the covariates and each variable at Times 2 and 3. Any significant paths, therefore, would be accounting for the correlations among the variables within a wave, and controlling for previous scores on the outcome variables, covariates, as well as the other predictors in the model.

The results of a Chi square difference test of relative fit indicated that the patterns of associations among the variables were invariant across time,  $\chi^2_{diff}(20) = 27.60$ ,  $p > .05$ . Thus, all subsequent analyses of the research questions were based on the model that was constrained over time, as this was the more parsimonious model. The constrained model fit was well-specified,  $\chi^2(40) = 46.10$ ,  $p = .24$ , CFI = .999 and RMSEA = .01, 90 % CI [.00–.02],  $p = 1.00$ . Table 4 shows beta weights for all paths in the model for all the five key study variables (only paths from Time 1 to Time 2 are shown as the results were

**Table 4** Beta weights (standardized and unstandardized) and standard errors for all Time 1–Time 2 cross-lagged paths

	$\beta$	<i>b</i>	<i>SE</i>	<i>p</i>
Religious activities 1 → spirituality 2	.237	1.603	.146	<.001
Religious activities 1 → diff emo reg 2	−.064	−.298	.120	.013
Religious activities 1 → social ties 2	.009	.054	.159	.736
Religious activities 1 → non-religious club activity 2	.038	.322	.270	.203
Non-religious club activity 1 → religious activities 2	−.004	.000	.002	.789
Non-religious club activity 1 → spirituality 2	−.012	−.010	.013	.449
Non-religious club activity 1 → diff emo reg 2	.001	.000	.011	.976
Non-religious club activity 1 → social ties 2	.054	.036	.014	.011
Spirituality 1 → religious activities 2	.146	.021	.003	<.001
Spirituality 1 → diff emo reg 2	.011	.007	.018	.676
Spirituality 1 → social ties 2	.054	.046	.023	.051
Spirituality 1 → non-religious club activity 2	.030	.040	.040	.314
Diff emo reg 1 → religious activities 2	.024	.005	.003	.119
Diff emo reg 1 → spirituality 2	−.014	−.021	.025	.412
Diff emo reg 1 → social ties 2	−.086	−.108	.028	<.001
Diff emo reg 1 → non-religious club activity 2	.001	.001	.047	.978
Social ties 1 → religious activities 2	.010	.002	.003	.530
Social ties 1 → spirituality 2	.013	.016	.021	.436
Social ties 1 → diff emo reg 2	−.033	−.027	.017	.107
Social ties 1 → non-religious club activity 2	−.012	−.020	.038	.608

Higher scores indicate more religious activities, non-religious club involvement, spirituality, difficulty regulating emotions, and social ties. Numbers 1 and 2 indicate Time 1 and Time 2, respectively. As the results were invariant across time, only Time 1–Time 2 results are shown. Results from the covariates can be obtained from the first author



invariant across time). The significant paths are depicted in Fig. 1.

Greater involvement in religious activities did not directly predict more social ties over time,  $\beta = .009$ ,  $SE = .16$ ,  $p = .74$ . The *indirect* effect, however, was significant. That is, greater involvement in religious activities predicted less difficulty with emotion regulation over time, controlling for previous difficulty with emotion regulation,  $\beta = -.06$ ,  $SE = .12$ ,  $p = .01$ , and, in turn, less difficulty with regulating emotion predicted more social ties over time, controlling for previous social ties,  $\beta = -.09$ ,  $SE = .03$ ,  $p < .001$  (the test of this indirect effect using bias-corrected bootstrapping was significant,  $\beta = .007$ , 95 % CI [.002–.02],  $p = .004$ ). Neither less difficulty with emotion regulation nor social ties predicted greater involvement in religious activities over time. Social ties also did not predict less difficulty with emotion regulation over time.

There were no significant bidirectional effects between spirituality and either difficulty with emotion regulation or social ties. The indirect effect from spirituality to social ties through emotion regulation also was not significant,  $\beta = .00$ , 90 % CI [–.01 to .003],  $p = .75$ . The results indicated a significant bidirectional association between involvement in religious activities and spirituality: more religious activities significantly predicted greater spirituality over time, controlling for previous spirituality,  $\beta = .24$ ,  $SE = .15$ ,  $p < .001$ , and more spirituality predicted greater religious activity over time, controlling for previous religious activity,  $\beta = .15$ ,  $SE = .003$ ,  $p < .001$ .

Furthermore, more involvement in non-religious clubs significantly predicted more social ties over time, controlling for previous social ties,  $\beta = .05$ ,  $SE = .01$ ,  $p = .01$ . Participation in non-religious clubs, however, did not predict involvement in religious activities, spirituality, or difficulty with regulating emotions over time. Similarly, involvement in religious activities, spirituality, difficulty with regulating emotions, and social ties did not predict involvement in non-religious clubs over time.

#### Moderator Results

The potential moderation of being born internationally versus in Canada was assessed. The Chi square difference test of relative fit was not significant,  $\chi^2_{\text{diff}}(20) = 17.44$ ,  $p = .62$ , indicating that the pattern of associations across time was not different between students born in Canada or internationally. The potential moderation of gender also was examined. The Chi square test of relative fit was not significant,  $\chi^2_{\text{diff}}(20) = 29.06$ ,  $p = .09$ , revealing that there was no gender difference in the pattern of results.

## Discussion

Emerging adulthood is a critical period for developing competency in intimate social relationships (Erikson 1968), and, thus, it is important for researchers to identify factors that may promote this asset. Involvement in religious activities has been identified as one factor that may promote social relationships (Lerner et al. 2002), but little research has examined this hypothesis among emerging adults, particularly university students who leave home to attend university and are faced with the difficult task of creating new social ties. In the present study, we examined the direct association between involvement in religious activities and social ties over time among university students (while accounting for involvement in non-religious clubs, spiritual attitudes/beliefs, gender, parent education, and international student status). We also investigated whether the association might be indirect, through emotion regulation, given findings from past studies that indicate that religiosity may help individuals monitor and control their emotions (e.g., Krägeloh et al. 2012; Pargament 1997), as well as the suggestion that emerging adulthood may be a time during which emotion regulation is refined (Arnett 2007; Schulenberg and Zarrett 2006). Crucially, these questions were examined by using a longitudinal data set, thereby allowing for the testing of bidirectional effects.

In broad strokes, the results of the current study indicated that prior involvement in religious activities uniquely predicted better emotion regulation over time (but not vice versa), and emotion regulation, in turn, predicted more social ties over time. Involvement in religious activities did not, however, directly predict greater subsequent social ties. Therefore, although there was no direct effect of involvement in religious activities on social ties, there was an indirect effect through emotion regulation.

The failure to find a direct association between involvement in religious activities and social ties may have been due to the fact that the measure of social ties used in the current study specifically assessed social ties *in the university setting*, and many of the participants in the sample were not involved in *on-campus* religious activities. Although, as some researchers have suggested, religiosity promotes social ties via the networks and capital developed through being involved in religious groups (see King and Furrow 2004; Smith 2003), those religiously-based networks may not necessarily carry over to other social settings such as university. That is, involvement in an off-campus religious group (which would presumably *not* be primarily comprised of people with whom an individual attends university) may not directly promote social ties with one's university classmates. Perhaps involvement in religious activities would have directly predicted social ties

had the measure assessed social ties *in general*, rather than university-specific social ties.

In contrast, *non-religious* activity involvement may have directly predicted greater social ties in a university setting over time because involvement in these groups may have primarily occurred in groups that met *on the university campus*, with members comprised entirely of one's fellow students. Although these data do not directly speak to this possibility, at the institution at which the participants were enrolled there are over 75 non-religious on-campus groups and only five religious groups, which suggests that there were many more opportunities for students to broaden their university-specific social ties through non-religious activity involvement than through religious groups.

One limitation to examining only university students is that the relationship between involvement in religious activities, emotion regulation, and social ties may be different for emerging adults who are not attending university. This may be especially poignant as the measures used in this study are aimed at social ties *in university* and many of the measures of activity engagement are for activities in a *university setting*. It would be interesting, therefore, to examine a similar research question for emerging adults *not* attending university. As King and Furrow (2004) and Smith (2003) suggest, if religiosity promotes social ties because of the networks created while attending religious activities, there may be a direct link from involvement in religious activities to social ties for individuals not attending university. Furthermore, the measure of *non-religious activity involvement* may have been heavily weighted by *on-campus activities*, thereby eliminating the ability to extrapolate findings from these emerging adults in university to emerging adults who are not attending university. It is important, therefore, for future research to examine similar questions such as the ones presented in the current study in a sample that is not comprised of university students, but of emerging adults who have chosen different directions or goals.

Although these results did not indicate a significant direct effect from involvement in religious activities to social ties, there was evidence that involvement in religious activities promoted social ties in a university setting indirectly, through emotion regulation. Specifically, higher involvement in religious activities predicted less difficulty with emotion regulation over time (controlling for previous emotion regulation), and less difficulty with emotion regulation predicted more social ties over time (controlling for previous social ties). Therefore, although involvement in religious activities and non-religious clubs both promoted social ties, involvement in religious activities uniquely predicted social ties through the *mechanism* of emotion regulation. This finding offers support for the idea that

there may be something unique about the participation in religious activities that is not attained simply through being part of any type of organized group (Good et al. 2009). These results are consistent with Larson et al.'s (2006) study comparing developmental experiences (e.g., emotion regulation, teamwork, social skills) that young people report having in various types of activities (e.g., sports, arts, academic clubs, faith-based activities, service activities), in which participants reported more "emotion regulation experiences" in faith-based activities than in community, arts, service, or sport activities.

Additionally, the results indicated that spiritual attitudes/beliefs towards the sacred did not directly, or indirectly, predict emotion regulation *or* social ties. Although some research has suggested that spirituality should predict better emotional self-regulation, the literature is fraught with inconsistency in how this construct is measured. It may be that the predictive effect of "spirituality" on better self-regulation is due to specific spiritual practices in which one engages rather than one's general attitude towards the value of the sacred in his/her life (as was measured by the Spiritual Transcendence Index used the current study). For example, specific practices aimed to facilitate connection with the sacred—such as meditation, fasting and prayer—may require high levels of self-regulation (McCullough and Willoughby 2009), and, as such, may be more strongly linked to emotional regulation than general attitudes towards the sacred. Indeed, McNamara (2002) indicates that engaging in practices such as meditation and prayer induces frontal lobe activation, which is implicated in executive functions (such as emotion regulation).

Finally, these results provided support only for socialization effects, in that prior involvement in religious activities promoted less difficulty with emotion regulation over time, but not vice versa. These results are consistent with the literature that suggests that participation in religious activities may promote better self- and emotion regulation (e.g., Baumeister et al. 2010; Koole et al. 2010; McCullough and Carter 2011). It also is consistent with Gross and John (2003) who suggest that the ability to regulate emotions effectively allows one to navigate social situations.

Furthermore, these findings lend support to a small but growing body of longitudinal research supporting socialization effects in the relationship between religiosity and positive adjustment. For example, Pössel et al. (2011) found that intrinsic religious orientation (e.g., those who practice their religion for the sake of *living* their religion, and not for personal gain) predicted lower depressive symptoms 4 months later, after controlling for initial level of depression (but not vice versa). Religious service attendance and the importance of religion also consistently have been found to predict lower substance use over time

(e.g., Good and Willoughby 2011, 2014; Mason and Windle 2002). Sallquist et al. (2010) assessed the socialization and selection hypotheses for the relationship between a variable encompassing both spirituality and religiosity and multiple domains of adjustment (social competence, self-esteem, loneliness, and externalizing problems). Their results supported both the socialization and selection hypotheses for social competence, but only the socialization hypothesis for loneliness. The present study is an important extension, as both involvement in religious activities and spirituality were examined concurrently as individual constructs, thereby allowing the potential differential effects on the outcome variables to be examined.

The current study is not without limitations. First, the data are based on self-report. It may have been beneficial to have reports from friends, or questions that are able to assess the types and/or quality of social ties that the participants report. Second, the sample was relatively homogeneous in terms of religious affiliation (see Table 3). Specifically, the majority of the sample was Christian (38.6 % Catholic, 25.1 % Protestant). As a result, it was not possible to examine the effects of different religions on the relationship between emotion regulation and social ties. This is important, as the responses to these items may have differed in a sample dominated by a different religion. For example, some researchers suggest that measures created to examine Christian ideas of religion cannot be used to study other religions, such as Islam (Agilkaya 2012). Future research should take this issue into consideration.

A third limitation is that on-campus club representations were not available for all the religious affiliations present in the study. The result of this limitation is that some individuals, therefore, would have been able to score higher in on-campus religious activities than others who did not have the ability to participate in an on-campus religious club. As indicated in the results, however, this measure was highly skewed indicating low participation rates in general.

Fourth, given that standardized path coefficients of .10 typically are seen as small effects in the social sciences, the coefficients that were significant in the present study were small in magnitude. However, small effect sizes are common in cross-lagged models when controlling for the stability of variables between adjacent waves of data and when accounting for the concurrent associations among variables within a wave (Adachi and Willoughby 2014). In this case, small effects would be expected. Additionally, small effects are not necessarily trivial effects, and the magnitude of effects is consistent with other studies that have used similar models (e.g., Mason and Windle 2002). Although Mason and Windle's (2002) sample was from the US, the small effect sizes in the current study also may be related to the fact that this sample was comprised of

Canadian young people, who typically view spirituality/religiosity as less important than their peers in other countries (e.g., US). Citing results from nationally representative surveys, Smith and Denton (2005) reported that 59 % of American adolescents attend religious services on a monthly basis (Smith and Denton 2005), whereas Bibby (2009) reported that only 33 % of Canadian youth attend religious services at least monthly. Moreover, individuals from non-Western cultures tend to score higher on religious and spiritual indices than individuals from Western cultures (Hsu et al. 2009; King et al. 2006). Furthermore, King et al. (2006) suggest that separating spirituality and religiosity is mainly a Christian/Western cultural idea that may not transfer over to non-Western/non-Christian cultures. Therefore, our results may not be comparable to a sample outside of Western culture if the manner in which we framed our religious and spiritual constructs is not transferrable to other cultures.

Finally, the current results are based on a sample of university students and may not be generalizable to the general population. Future research should seek to examine whether the associations between involvement in religious/non-religious activities, emotion regulation and social ties hold in a sample of emerging adults who have not attended university, or for those who have finished university and are in the later years of emerging adulthood (e.g., 28–29 years of age). Importantly, little work has been conducted on the later years of emerging adulthood, but presumably, once individuals have reached this time period, there may be, on average, less of an emphasis on identity exploration. For example careers may already be established, and romantic partners may have become more serious (see Arnett 2000). Thus, there may be more stability regarding religiosity in these years.

Despite the above limitations, however, the present study offers a significant contribution to the body of knowledge on the association between religiosity and psychosocial adjustment (specifically, involvement in religious activities, emotion regulation and social ties) in emerging adulthood. This is the first known study to examine the constructs included in this study simultaneously in one model, and to do so using a longitudinal design. Future studies should seek to investigate specific dimensions of religious and spiritual beliefs and practice that may predict better emotion regulation over time. Although the results did not provide evidence that spirituality (in terms of a general orientation towards the role of the sacred in one's life) predicts better emotion regulation over time, it may be that individuals who regularly engage in self-controlled behaviors that facilitate a connection with the sacred have higher emotion regulation than individuals who do not engage in these behaviors. Investigating this question may require adopting a person-centered approach

(e.g., using techniques such as latent class analysis), so that individuals with diverse spiritual/religious profiles can be identified and compared on indices of emotion regulation. Additionally, it may be important in the future to examine *experiences* that individuals have within religious groups that are critical to the creation of social ties. For example, how much support an individual feels s/he receives from members of his/her religious group may be a stronger predictor of social ties than the frequency of involvement in religious activities or the reading of Holy texts.

Finally, these results provide information relevant to potential implications for research and prevention work. First, the results of the current study indicate that, similar to experimental studies, religiosity (specifically here, involvement in religious activities) is related to increased emotion regulation over time. This result is important for future research, as it provides further support to the literature that suggests that involvement in religious and non-religious activities is associated with positive outcomes (e.g., Bartko and Eccles 2003; Good et al. 2009; Youniss et al. 1997), although in the current study, the manner in which the outcome (social ties) was predicted (directly or indirectly) differed by the type of activity.

Second, the results of the current study indicate that involvement in activities promotes social ties over time. This is important for interventions and/or preventions that are focused on aiding individuals' attempts to create social networks. As emerging adulthood is a time during which the creation of social ties is important (Erikson 1968), this research plays an important role by demonstrating how activity involvement may enhance social ties over time. Social ties also are associated with psychological well-being (see Winefield et al. 1992), so it would be of use to promote clubs or groups in which individuals can be involved. A key target group, then, may be new, incoming university students, given that the transition to university from high school might be an important time for the creation of social ties (Erikson 1968). To examine this question further, however, future research should address this more complex model longitudinally, to examine how these associations (activity involvement, emotion regulation, social ties) are related to psychological well-being over time.

## Conclusion

We examined whether involvement in religious activities predicted greater social ties over time either directly and/or indirectly through emotion regulation; there was, however, evidence only for an indirect effect. Furthermore, it was involvement in religious activities, and not spirituality, that was associated with better emotion regulation and,

subsequently, social ties. These results add to the growing literature on the role that involvement in religious activities may play in psychosocial adjustment among university students. Furthermore, the results of the current study indicate that although involvement in religious and non-religious club activities both promote social ties, the mechanism by which this process occurs may be different.

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