

Evaluating the Direction of Effects in the Relationship Between Religious Versus Non-Religious Activities, Academic Success, and Substance Use

Marie Good · Teena Willoughby

Received: 21 May 2010 / Accepted: 30 July 2010 / Published online: 14 August 2010
© Springer Science+Business Media, LLC 2010

Abstract This longitudinal study tested the *influence of involvement* and *selection* hypotheses for the association between religious versus non-religious activity involvement and two salient indicators of adolescent psychosocial adjustment (substance use and academic achievement). Participants included 3,993 Canadian adolescents (49.4% girls) who were surveyed each year from grades 9–12. More frequent religious attendance (but not non-religious club involvement) in one grade predicted lower levels of substance use in the next grade. Higher levels of non-religious club involvement (but not religious service attendance) in one grade predicted higher academic achievement in the next grade, and higher academic achievement in one grade predicted more frequent non-religious club involvement in the next grade. The effects were robust, as they were invariant across grade and significant after controlling for individual, peer, and family characteristics. Most importantly, these results suggest that religious activities are not just another club, but, rather, that different developmental assets may be fostered in religious as compared to non-religious activities.

Keywords Religious activities · Extracurricular activities · Structured activities · Longitudinal study · Direction of effects · Substance use · Academic achievement

Introduction

Within the Positive Youth Development framework (e.g., Lerner et al. 2003), where priority is placed on

understanding and promoting positive developmental features, both religious and non-religious structured activities are seen as environments where intrapersonal and interpersonal assets may be fostered in adolescents (e.g., Dworkin et al. 2003; King and Furrow 2004). Religious activities (e.g., attendance at church), however, may be a particularly unique form of structured activity where young people may have experiences not typically gained in other types of clubs (e.g., Smith 2003a). Different assets, therefore, may be fostered by religious, as compared to non-religious clubs. Similarly, different types of adolescents may be drawn to participate in religious versus non-religious activities.

Differences between religious and non-religious activities have been largely overlooked within the literature, as religious activities often are not examined as a unique category (e.g., Gardner et al. 2008). Not surprisingly, then, potential differences in the relationships between religious versus non-religious activities and adolescent psychosocial adjustment also have not been examined. In the present study, we evaluate differential relationships between participation in these activities and two commonly-studied indicators of adjustment in adolescence (substance use and academic achievement), with a focus on assessing differences in the direction of effects for religious versus non-religious activities as well as the robustness of these effects across time and in the presence of multiple control variables.

The Uniqueness of Religious Service Attendance

There are several unique aspects of religious as compared to non-religious activities (see Good et al. 2009). For example, religious congregations typically present their

M. Good (✉) · T. Willoughby
Department of Psychology, Brock University,
St. Catharines, ON L2S 3A1, Canada
e-mail: marie.good@brocku.ca

adherents with worldviews about the purpose of life, a set of moral directives about what is right and wrong (e.g., Smith 2003a), and distinct (i.e., religion-based) strategies for coping with stress (e.g., Smith 2003a). Further, spiritual experiences such as group rituals, prayer, and the perception of receiving divine guidance—which may be positive, powerful experiences in the lives of adolescents—often happen within the context of religious groups (e.g., Good and Willoughby 2007). Religious activities also offer unique interpersonal environments. Notably, because religious groups are one of the only formal institutions in which adolescents participate that are not rigidly age-stratified, teens may develop relationships with individuals from younger and older cohorts (e.g., Glanville et al. 2008), which may lead to increased social network closure and social capital (e.g., Smith 2003b). There also may be some unique negative experiences inherent in being part of some religious groups, including the obstruction of identity exploration (e.g., adherents in some religious groups are encouraged to unquestioningly accept the tenets of their faith; Hunsberger et al. 2001), and guilt for adolescents who engage in activities that go against the moral order of their religion (e.g., Albertsen et al. 2006).

Given their unique features, it could be argued that religious activities should be examined as a separate category of extracurricular clubs. In studies on activity involvement in adolescence, however, religion-based activities have been largely subsumed under the umbrellas of “community,” “prosocial,” “structured”, or “service/civic” club categories (e.g., Barber et al. 2001; Gardner et al. 2008). Failing to separate religious from non-religious activities is problematic because adolescents who are involved in religious activities are also more likely to be involved in non-religious clubs (i.e., they are more likely to be “joiners”, Glanville et al. 2008; Regnerus and Smith 2005). As a result, it is possible that associations that have been found between general activity involvement and psychosocial adjustment may be partially explained by religious activity involvement, and, conversely, associations between religious involvement and adjustment may be partially explained by involvement in non-religious clubs.

Academic success and substance use are two commonly-studied indicators of adolescent adjustment that are particularly illustrative of the potential problems with examining activity involvement without separating religious and non-religious activities. Studies have found that activity involvement is associated with lower substance use (e.g., Barber et al. 2001; Youniss et al. 1999) and greater academic success (e.g. Mahoney 2000; Regnerus and Elder 2003). However, because many religious groups explicitly discourage any adolescent substance use, but most non-religious clubs do not, it is possible that religious

attendance may (at least partially) explain the link between general activity involvement and substance use. Conversely, for academic achievement, because non-religious groups may foster skills that are more directly related to school success (particularly school clubs, as members often have to keep their GPA at a certain level in order to participate), involvement in non-religious clubs may at least partially explain the link between religious activity involvement and academic success.

In two previous studies, we attempted to disentangle the associations between religious versus non-religious activity involvement and substance use and academic achievement (Good and Willoughby 2006; Good et al. 2009). The results indicated that religious service attendance, in comparison to non-religious activity involvement, was more consistently associated with less substance use, and non-religious activity involvement, in comparison to religious service attendance, was more consistently associated with higher academic success. These studies were limited, however, in that they focused primarily on within-time (i.e., concurrent) associations, and, as such, did not explore the *direction of effects* among these associations. In other words, it is unclear whether prior involvement in religious services or non-religious clubs may have influenced adolescents’ subsequent levels of substance use and/or academic success, or, conversely, prior substance use and academic standing influenced adolescents’ subsequent attendance at religious services and/or involvement in clubs. There are two hypotheses, therefore, with regard to the direction of effects for the link between religious and non-religious activity involvement and positive adjustment. The first hypothesis is that religious and/or non-religious club involvement may contribute to adolescents’ decisions to engage in less substance use and/or do better at school (the *influence of involvement hypothesis*). An alternative possibility is that adolescents who get better grades and/or engage in lower levels of substance use are more likely to choose to attend religious and/or non-religious clubs (the *selection hypothesis*). Below we consider both theoretical and empirical evidence pointing to the possibility that these hypotheses may be differentially supported for religious as compared to non-religious activities.

With regard to substance use, a unique trait of religious groups is their promotion of moral/religious worldviews (Smith 2003a), and in many religions, the wrongness of adolescent substance use is a component of those beliefs. Consistent exposure to these worldviews, as well as being part of a community of individuals who believe adolescent substance use is a moral offense, are factors unique to religious activities that may influence adolescents’ decisions about substance use (Smith 2003b), consistent with the *influence of involvement hypothesis*. In contrast, because non-religious activities typically do not present

religious worldviews, it is perhaps less likely that involvement in non-religious activities would directly affect adolescents' views about the morality of substance use. On the other hand, the *selection* hypothesis also may help explain the link between substance use and religious activities. Adolescents who engage in substance use may decrease their involvement in religious activities over time, as they could feel uncomfortable in the presence of religious peers and adults who disapprove of their actions (Regnerus and Uecker 2006). Because substance use is not usually directly discouraged in non-religious activities, however, adolescents who use substances may be less likely to drop out of non-religious clubs, as compared to religious activities.

With regard to academic achievement, because non-religious groups may foster skills (e.g., dance, music, politics, debating, business; Larson et al. 2006) that are more directly related to school success, non-religious clubs may be the driving factor behind “involved” adolescents' academic achievement, consistent with the *influence of involvement* hypothesis. For example, participation in non-religious extracurricular clubs is associated with school engagement (e.g., Dotterer et al. 2007) and positive attitudes towards education (e.g., Fredricks and Eccles 2008). Because religious groups may not promote behaviors and attitudes so directly related to educational or career success, it is perhaps less likely that religious activity involvement would directly impact upon academic achievement. Similarly, *selection* effects of academic achievement may be stronger for non-religious clubs than religious activities. Individuals who do not do as well in school as their peers may feel uncomfortable in clubs where members are largely comprised of high-achieving students (e.g., Mahoney and Cairns 1997). Further, many school-based clubs may require their members to keep their GPAs at a certain level. There are, of course, no academic competence requirements for attending religious services, and so individuals who do not do well in school may be less likely to drop out of religious activities than they would be to discontinue their involvement in other clubs.

Only a very limited number of studies have tested the direction of effects in the relationship between either religious or non-religious activity participation and substance use and/or academic success. The direction of effects is typically assessed with longitudinal data, where the temporal ordering of variables can be inferred. With regard to the relationship between religious attendance and substance use, researchers have found support for both the *influence of involvement* hypothesis (i.e., religiosity at time 1 predicted substance use at time 2, after controlling for time 1 substance use; Mason and Windle 2002; Nonnemaker et al. 2006; Steinman and Zimmerman 2004) and, to a lesser extent, the *selection* hypothesis (substance use at time 1 predicted religiosity at time 2 after controlling for

religiosity at time 1; Burkett and Warren 1987). Only two studies of which the authors are aware have evaluated the direction of effects in the relationship between religious activities and academic success. Glanville et al. (2008) and Muller and Ellison (2001) tested the direction of effects by using autoregressive cross-lagged models, and both found support for the *influence of involvement* hypothesis.

Several longitudinal studies have assessed the direction of effects for the relationship between general structured activity involvement and academic success or substance use. For academic success, support has been found for both the *influence of involvement* hypothesis (e.g., Fredricks and Eccles 2006; Gardner et al. 2008; Mahoney et al. 2003) as well as the *selection* hypothesis (e.g., Fredricks and Eccles 2006). Similarly, for substance use, both the *influence of involvement* (e.g., Fredricks and Eccles 2006; Hoffman 2006) and the *selection* (e.g., Fredricks and Eccles 2006) hypotheses have been supported. These studies are limited, however, because they either did not assess religious activities, or did not assess them as a unique category.

No studies of which the authors are aware have simultaneously assessed both the *influence of involvement* and the *selection* hypotheses for religious versus non-religious activities in relation to both substance use and academic achievement. Therefore, the relative strength of these hypotheses for the associations among these variables has never been compared. Given the uniqueness of religious activities and the finding that religiously-committed adolescents may be overrepresented in non-religious clubs, this issue is important to consider.

Further, studies that have tested the direction of effects share an important limitation, in that the time-specific effects of cross-lagged relationships (e.g., differences in the path between grades 9 and 10 versus the path between grades 10 and 11) were not assessed. This limitation is partially due to the fact that nearly all of these studies only assessed participants at two time points. Only one other study of which the authors are aware has assessed across-time differences in direction of effects for the relationship between religiosity and substance use (Burkett and Warren 1987), but this study had a small sample size ($n = 264$), and only examined marijuana use. Almost nothing is known, therefore, about whether the *influence of involvement* and *selection* hypotheses are consistently supported over the adolescent years.

The lack of attention paid to over-time differences is a significant limitation, as another way in which religious activities differ from non-religious activities is in the trajectory of involvement across adolescence. It is normative for the frequency of religious service attendance to decline (e.g., Steinman and Zimmerman 2004), while levels of involvement in other structured clubs remain stable (e.g., Bussari et al. 2006). As involvement in religious activities

becomes less typical in late adolescence, the “effect” of being involved may change. It could become stronger, as adolescents may identify more powerfully with their religious beliefs as something that makes them unique, and/or identify more strongly with peers who hold similar religious beliefs (i.e., religious peers may reinforce conventional behavior such as avoiding substance use and doing well at school). It is perhaps more likely, however, that the effect of religious service attendance could become weaker over time in its effect as a social control mechanism, particularly when peers do not hold similar religious beliefs and engage in substance use (i.e., peers’ substance use may be a more powerful determinant of individuals’ substance use as adolescents get older, as compared to religious proscriptions). Further, because religious doubt/questioning tends to increase throughout adolescence (e.g., Levenson et al. 2005), older adolescents may question the validity of their religious groups’ claims that substance use is wrong to a greater extent than young adolescents. All of these factors may result in religious service attendance having less of an impact on substance use as adolescents get older.

It is also possible that adolescents who attend religious services in late high school may be experiencing a lack of autonomy granted to them by their parents (i.e., they may be forced to attend). Decline in attendance at religious activities has been linked to increasing personal autonomy (e.g., Regnerus and Uecker 2006), which in turn is associated with positive adjustment (e.g., Soenens et al. 2007). Some late adolescent attendees, therefore, may experience less positive well-being than non-attendees, and this may weaken the relationship between religious service attendance and positive adjustment. The effect of involvement in non-religious clubs, however, may be expected to remain more stable across adolescence. From a developmental perspective, then, it is important to evaluate whether the direction of effects are consistent over time for the relationship between religious versus non-religious activities and positive adjustment.

Third Variable Problem. It also is important to consider the possibility that the link between religious or non-religious activity participation and substance use and/or academic success may be due to their common associations with other unmeasured, or third, variables. Potential third variables, or control variables, have been suggested in previous research, and these variables appear to be similar for religious and non-religious activity involvement. Specifically, being female, having higher socio-economic status, having fewer deviant friends, reporting better relationships with parents and greater parental control/monitoring, having an “easy” temperament characterized by self-control, persistence, and attention, and being more risk averse or intolerant of deviance are all associated with

greater involvement in religious and non-religious activities, greater academic success, and less substance use (e.g., Feldman and Matjasko 2007; Fredricks and Eccles 2006; Glanville et al. 2008; Regnerus and Smith 2005).

In the present study, we measured each of these control variables and specifically assessed whether *influence of involvement* and *selection* hypotheses for both religious and non-religious activities “held up” after controlling for these variables. The robustness of the findings in the presence of control variables is another way in which the differences in the relationship between religious versus non-religious activities and substance use/academic marks may be revealed. For instance, if both religious service attendance and non-religious activity involvement predicted substance use over time (supporting the *influence of involvement* hypothesis for both activities), but non-religious involvement no longer predicted substance use after accounting for the control variables, it would imply that only religious service attendance uniquely predicted substance use, while the effect for non-religious involvement could be explained by the control variables.

The Present Study

The present study is unique in that it simultaneously tested the *influence of involvement* and *selection* hypotheses (i.e., the direction of effects) for religious and non-religious activities in relation to both substance use and academic achievement, tested if the *influence of involvement* and *selection* hypotheses were consistently supported across four grades of high school, and evaluated the robustness of the results in the presence of multiple control variables reflecting individual-, friend-, and parent-level characteristics. Our analyses were primarily exploratory, given that this is the first study to assess both the *influence of involvement* and *selection* hypotheses for religious and non-religious activities simultaneously over multiple waves. However, for substance use, because attendance at religious services (but *not* involvement in non-religious clubs) may foster unique motivations for avoiding substance use (Smith 2003a), and because adolescents who engage in substance use may feel uncomfortable in religious communities (Regnerus and Uecker 2006), it was expected that both the *influence of involvement* and *selection* hypotheses would be stronger for religious service attendance than for non-religious involvement, and would be robust in the presence of the control variables. In contrast, with regard to academic success, because non-religious clubs may foster skills that are more directly related to educational/career success (e.g., Wood et al. 2009) than religious services, and since adolescents who are less skilled academically may be more likely to be

excluded from non-religious clubs than from religious groups, both the *influence of involvement* and *selection* hypotheses were expected to be stronger for non-religious than religious activities, and robust in the presence of control variables. Further, while our assessment of the consistency of effects over time were exploratory, we expected that for religious attendance, but not for non-religious club involvement, the *influence of involvement* hypothesis may be supported in the early years rather than in the later years of high school (particularly for substance use).

Method

Participants

Students from eight high schools encompassing a school district in Ontario, Canada took part in the study. This longitudinal-sequential study was part of a larger project examining youth lifestyle choices, involving 5 waves of survey data from 2003 to 2008. The current analysis is based on the 3,993 participants (49.4% female) who completed the survey at a minimum of 2 time points (out of a total of 4,412 participants). The overall participation rate ranged from 83 to 86%; non-participation was due to student absenteeism (average of 13.7%), parent refusal (average of .90%), or student refusal (average of 1.3%). Student absenteeism from class was due to illness, a co-op placement, a free period, or involvement in another school activity. Consistent with the broader Canadian population (Statistics Canada 2001a), 92.4% of the participants were born in Canada and the most common ethnic backgrounds reported other than Canadian were Italian (31%), French (18%), British (15%), and German (12%). Data on socioeconomic status indicated mean levels of education for mothers and fathers falling between “some college, university or apprenticeship program” and “completed a college/apprenticeship/technical diploma.” Further, 70% of the respondents reported living with both birth parents, 12% with one birth parent and a stepparent, 15% with one birth parent (mother or father only), and the remainder with other guardians (e.g., other relatives, foster parents). The school board did not permit the release of students’ religious affiliations; however, the board was publicly funded (i.e., the schools were not private) and the religious affiliation of the population in this region is 37% Catholic, 42% Protestant, 14% no affiliation, and 17% other (e.g., Muslim, Hindu, Jewish) (Statistics Canada 2001b).

Because of the study’s longitudinal-sequential design, the sample included 3 cohorts. One cohort included students ($N = 1,471$) who entered high school in the academic year 2002/2003 and completed the survey when they were in grades 9, 11, and 12. The second cohort of students

entered high school in the academic year 2003/2004 ($N = 1,226$) and completed the survey when they were in grade 10, 11, and 12. The third cohort of students ($N = 1,492$) entered high school in the academic year 2004/2005 and completed the survey when they were in grade 9, 10, 11, and 12. An additional 223 students who were absent at the first wave of data collection completed the survey during the subsequent data collection periods. Because the missing data due to the longitudinal-sequential design was not dependent on the values of the study measures, it is reasonable to assume that this data is missing completely at random (Little and Rubin 2002). In analyses using AMOS 17.0, missing waves are estimated using the full information maximum likelihood (FIML) estimation method. FIML retains cases missing one or more waves, thus avoiding the biased parameter estimates that can occur with pair-wise or list-wise deletion (Schafer and Graham 2002).

In addition, an examination of mean differences on the main study measures depending on cohort revealed no significant differences among the cohorts other than in grade 10, in which the second cohort entering high school in the 2003/2004 academic year reported significantly lower scores on friends’ tolerance of substance use, than the third cohort entering high school in the academic year 2004/2005 ($p < .001$; mean difference of .27 and η^2 value of .016). As differences between cohorts were limited, all analyses combined students across cohorts into one sample with the data structured by grade (9, 10, 11, and 12). Cohort was included as a covariate in all analyses.

A second source of missing data occurred because some students did not finish the entire questionnaire. To ensure that any missing data was missing at random, we included three versions of the survey at each time period so that the same scales were not always near the end of the survey. For multi-item scales, composite scores were computed for participants who responded to at least 50% of the relevant items. For respondents who did not give a sufficient number of responses within a multi-item scale, or did not provide a response to a single-item measure, missing values *within each wave* were imputed. In total, 12.2% of the data were imputed, using the EM (expectation-maximization) algorithm. This percentage of imputed data is consistent with other longitudinal survey studies (e.g., Feldman et al. 2009). EM is an iterative maximum-likelihood (ML) procedure in which a cycle of calculating means and covariances followed by data imputation is repeated until a stable set of estimated missing values is reached. Research has demonstrated that ML estimation is preferable to more common methods such as pair-wise deletion, list-wise deletion, or means substitution (Schafer and Graham 2002).

Participants who completed the survey at only one time period reported significantly less positive scores than longitudinal participants on all the measures with the exception of religious and non-religious club attendance as well as task orientation (all $ps < .001$). Magnitudes of the between group differences, however, were small (mean differences ranging from .12 for parental relationship quality to .40 for academic marks; individual η^2 values ranging from .005 for parental education to .028 for academic marks).

Procedure

Active informed assent was obtained from the adolescent participants. Parents were provided with written correspondence mailed to each student’s home prior to the survey administration outlining the study; this letter indicated that parents could request that their adolescent not participate in the study. An automated phone message about the study also was left at each student’s home phone number. This procedure was approved by the participating school board and the University Research Ethics Board. At all time periods, the questionnaire was administered to students in classrooms by trained research staff. Students were informed that their responses were completely confidential.

Measures

Means and standard deviations for the measures are provided in Table 1. Each measure other than gender and parental education was assessed at each of the high school grades.

Religious Service Attendance

Religious service attendance (church/synagogue/temple) was measured by one item assessing the frequency of attendance in the past month using a 5-point scale ranging from *never* to *every day*.

Non-Religious Club Involvement

Non-religious club involvement was measured by a composite of two items assessing the frequency of attendance in school clubs and out-of-school clubs in the past month, using a 5-point scale ranging from *never* to *every day*.

Substance Use

Substance use was measured by a composite scale of four items: typical frequency of alcohol use on an 8-point scale, where 1 = *never*, and 8 = *every day*; average consumption per drinking episode on a 6-point scale, where 1 = *less than one drink*, and 6 = *more than 10 drinks*; typical number of cigarettes smoked each day on an 8-point scale where 1 = *none* and 8 = *more than a pack*; and frequency of marijuana use in the past year on a 6-point scale where 1 = *never* and 6 = *every day*. All behaviors were recoded to fit a range of 1–6 in order to create the composite (Cronbach alphas were .77, .77, .75, and .75 for grades 9, 10, 11, and 12, respectively). Results from a principal component analysis revealed a one-factor solution at each grade (factor loadings of .5 or higher),

Table 1 Means and standard deviations of study measures

| Variable | Scale range | Grade 9 <i>M</i> (SD) | Grade 10 <i>M</i> (SD) | Grade 11 <i>M</i> (SD) | Grade 12 <i>M</i> (SD) |
|--|-------------|--------------------------|---------------------------|---------------------------|---------------------------|
| Gender | 1–2 | 1.49 (.50) | | | |
| Parental education | 1–6 | 3.23 (1.05) | | | |
| Age | – | 14 years (0.32) | 15 years (0.45) | 16 years (0.49) | 17 years (0.50) |
| Religious service attendance | 1–5 | 1.90 (.89) | 1.72 (.87) | 1.66 (.91) | 1.65 (.92) |
| Non-religious club involvement | 1–5 | 2.05 (.98) | 2.07 (1.03) | 2.03 (1.09) | 2.08 (1.09) |
| Substance use | 1–6 | 1.48 (.68) | 1.91 (.93) | 2.26 (1.00) | 2.45 (1.01) |
| Academic marks | 1–5 | 3.40 (.87) | 3.37 (.90) | 3.39 (.89) | 3.51 (.86) |
| Task orientation temperament | 1–4 | 2.50 (.53) | 2.45 (.57) | 2.46 (.56) | 2.47 (.57) |
| Attitudinal tolerance of deviance | 1–4 | 1.88 (.48) | 1.99 (.52) | 2.01 (.54) | 2.01 (.59) |
| Friends’ tolerance of substance use | 1–4 | 2.38 (.89) | 2.66 (.86) | 2.79 (.83) | 2.86 (.79) |
| Friends’ attitudes toward academic success | 1–4 | 2.53 (.43) | 2.49 (.54) | 2.42 (.50) | 2.49 (.59) |
| Parental relationship quality | 1–4 | 3.00 (.48) | 2.92 (.51) | 2.88 (.50) | 2.88 (.48) |
| Parental control | 1–4 | 3.02 (.64) | 2.87 (.74) | 2.73 (.76) | 2.56 (.78) |

Higher scores for religious service attendance, non-religious club involvement, substance use, and academic marks indicate higher levels of the variables. Higher scores for task orientation temperament indicate more persistence/less distractibility. Higher scores for attitudinal tolerance of deviance and friends’ tolerance of substance use indicates more tolerance. Higher scores for friends’ attitudes towards academic success indicates more positive attitudes. Higher scores for parental relationship quality indicate higher relationship quality, and higher scores for parental control indicate greater control

supporting our decision to create a composite for these variables. Combining these scores into a composite is also consistent with previous research (e.g., Donovan et al. 1988).

Academic Success

Academic success was measured by the item “what grades do you typically get in school?” Participants responded on a 5-point scale where 1 = *below 50%* and 5 = *A*.

Control Variables

Demographic Characteristics

Gender and *parental education* (as an indicator of socioeconomic status, one item per parent, averaged for those reporting on both parents, $r = .44$) were assessed. Higher scores indicate greater age, female gender (1 = *male*, 2 = *female*), and greater parental education, respectively (1 = *I did not finish high school* to 6 = *professional degree*).

Individual Characteristics

Individual-level characteristics included attitudinal tolerance of deviance and task orientation temperament. *Attitudinal tolerance of deviance* (adapted from Costa et al. 1999) is an 11-item scale assessing general attitudes and beliefs about right and wrong. Questions deal with issues such as trust, respect, social rules and boundaries (e.g., How wrong is it to cheat on a test; give a fake excuse to a teacher; damage someone’s property?). Respondents answered on a 4-point scale from 1 = *very wrong* to 4 = *not at all wrong* ($\alpha = .88, .88, .89, \text{ and } .90$). *Task Orientation Temperament* is a subscale adapted from the Revised Dimensions of Temperament Survey (Windle and Lerner 1986). The subscale consists of 6 items that assess how persistent and distractible individuals perceive themselves to be when working on a task (e.g., I persist at a task until it is finished; Once I am involved in a task nothing can distract me from it). Response options ranged from 1 = *almost never or never* to 4 = *almost always or always* ($\alpha = .70, .74, .70, \text{ and } .65$).

Friend Characteristics

Friend characteristics assessed in the present study were friends’ tolerance of substance use and friends’ attitude towards academic success. *Friends’ tolerance of substance use* was assessed by a 4-item scale that measures how upset a participant believes his/her friends would be if s/he was to engage drinking alcohol, smoking, using marijuana, or

using other illegal drugs. Respondents answered on a 4-point scale, from 1 = *very upset* to 4 = *not at all upset*. Alpha values in grades 9–12 were .89, .85, .82, and .80. *Friends’ attitude towards academic success* was measured by a single item (How important is it to your friends that you do well in school?). Respondents answered on a 4-point scale, from 1 = *not at all important* to 4 = *very important*.

Parent Characteristics

Parent-level characteristics included parental control and quality of relationship with parents. *Parental control* was assessed with 6 items (Stattin and Kerr 2000) that asked the extent to which parents imposed restrictions and required information about adolescent’s activities and whereabouts (e.g., Do you need your parent’s permission to stay out late on a weekday evening?). Respondents answered on a 4-point scale from 1 = *almost never or never* to 4 = *almost always or always* ($\alpha = .88$ at all grades). *Parent relationship quality* was measured by 17 items from the Inventory of Parent and Peer Attachment Armsden and Greenberg (1987). Participants completed this scale for both mother and father. Items (e.g., My mother trusts my judgment; My father can tell when I’m upset about something) were responded to on a 4-point scale ranging from 1 = *almost never or never* to 4 = *almost always or always*. A composite score averaging the mother and father items was created (average $r = .61, \alpha = .94, .93, .93 \text{ and } .92$).

Results

Preliminary Analyses

All variables exhibited acceptable skewness and kurtosis (Kline 2005). Table 2 outlines the correlations among variables. There was stability in scores across grades for each variable, with the greatest stability shown for substance use (average $r = .64$ across adjacent grades).

Primary Analysis

The *influence of involvement* and *selection* hypotheses were assessed using autoregressive (panel) models, where all variables were measured at each wave. Autoregressive models allow researchers to assess direction of effects by estimating reciprocal cross-lagged parameters that 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, and vice versa (Little et al. 2009). The primary statistical analyses were carried out using path analysis with

Table 2 Correlations among main study variables

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | |
|------------------------|---|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|
| 1. RS Attendance 9 | – | .47 | .37 | .36 | .24 | .09 | .11 | .10 | –.11 | –.14 | –.10 | –.08 | .14 | .16 | .09 | .09 | –.03 | .14 | |
| 2. RS Attendance 10 | | – | .44 | .43 | .15 | .17 | .05 | .09 | –.05 | –.11 | –.12 | –.13 | .08 | .15 | .10 | .12 | .03 | .15 | |
| 3. RS Attendance 11 | | | – | .48 | .11 | .09 | .26 | .11 | –.07 | –.09 | –.07 | –.07 | .07 | .10 | .10 | .06 | –.03 | .14 | |
| 4. RS Attendance 12 | | | | – | .08 | .11 | .11 | .28 | –.09 | –.06 | –.05 | –.07 | .08 | .07 | .06 | .13 | –.03 | .13 | |
| 5. NRC Involvement 9 | | | | | – | .40 | .32 | .27 | –.03 | –.07 | –.03 | –.06 | .14 | .17 | .14 | .15 | .04 | .15 | |
| 6. NR Involvement 10 | | | | | | – | .42 | .37 | –.02 | –.03 | –.02 | –.02 | .12 | .17 | .12 | .13 | .02 | .16 | |
| 7. NR Involvement 11 | | | | | | | – | .48 | –.07 | –.05 | –.03 | –.02 | .18 | .17 | .19 | .19 | .01 | .19 | |
| 8. NR Involvement 12 | | | | | | | | – | –.08 | –.04 | –.06 | –.04 | .16 | .13 | .16 | .21 | .03 | .14 | |
| 9. Substance use 9 | | | | | | | | | – | .61 | .43 | .38 | –.26 | –.21 | –.20 | –.15 | –.02 | –.08 | |
| 10. Substance use 10 | | | | | | | | | | – | .66 | .52 | –.28 | –.28 | –.21 | –.17 | –.09 | –.08 | |
| 11. Substance use 11 | | | | | | | | | | | – | .66 | –.24 | –.29 | –.28 | –.23 | –.12 | –.07 | |
| 12. Substance use 12 | | | | | | | | | | | | – | –.18 | –.27 | –.26 | –.23 | –.19 | –.06 | |
| 13. Academic marks 9 | | | | | | | | | | | | | – | .57 | .54 | .49 | .07 | .22 | |
| 14. Academic marks 10 | | | | | | | | | | | | | | – | .63 | .58 | .14 | .24 | |
| 15. Academic marks 11 | | | | | | | | | | | | | | | – | .62 | .15 | .24 | |
| 16. Academic marks 12 | | | | | | | | | | | | | | | | – | .19 | .23 | |
| 17. Gender | | | | | | | | | | | | | | | | | | – | –.05 |
| 18. Parental education | | | | | | | | | | | | | | | | | | | – |

RS religious service, NRC non-religious club

The smallest correlation significant at $p < .05$ is $r = .05$; the smallest correlation significant at $p < .01$ is $r = .06$. Due to space constraints, only the demographic covariates (gender and parental education) are included

AMOS 17.0, which allowed us to simultaneously estimate all cross-lagged parameters of interest among religious service attendance, non-religious club involvement, substance use, and marks. We adopted a conservative approach to our analyses by including only manifest variables, as a fully latent approach is more difficult to estimate with the number of variables included in our study. Overall model fit was evaluated using the comparative fit index (CFI), and the root mean squared error of approximation (RMSEA). As recommended by Hu and Bentler (1999), CFI values greater than .95 and RMSEA’s less than .06 (simultaneously) were used as the criteria for a well-specified model.

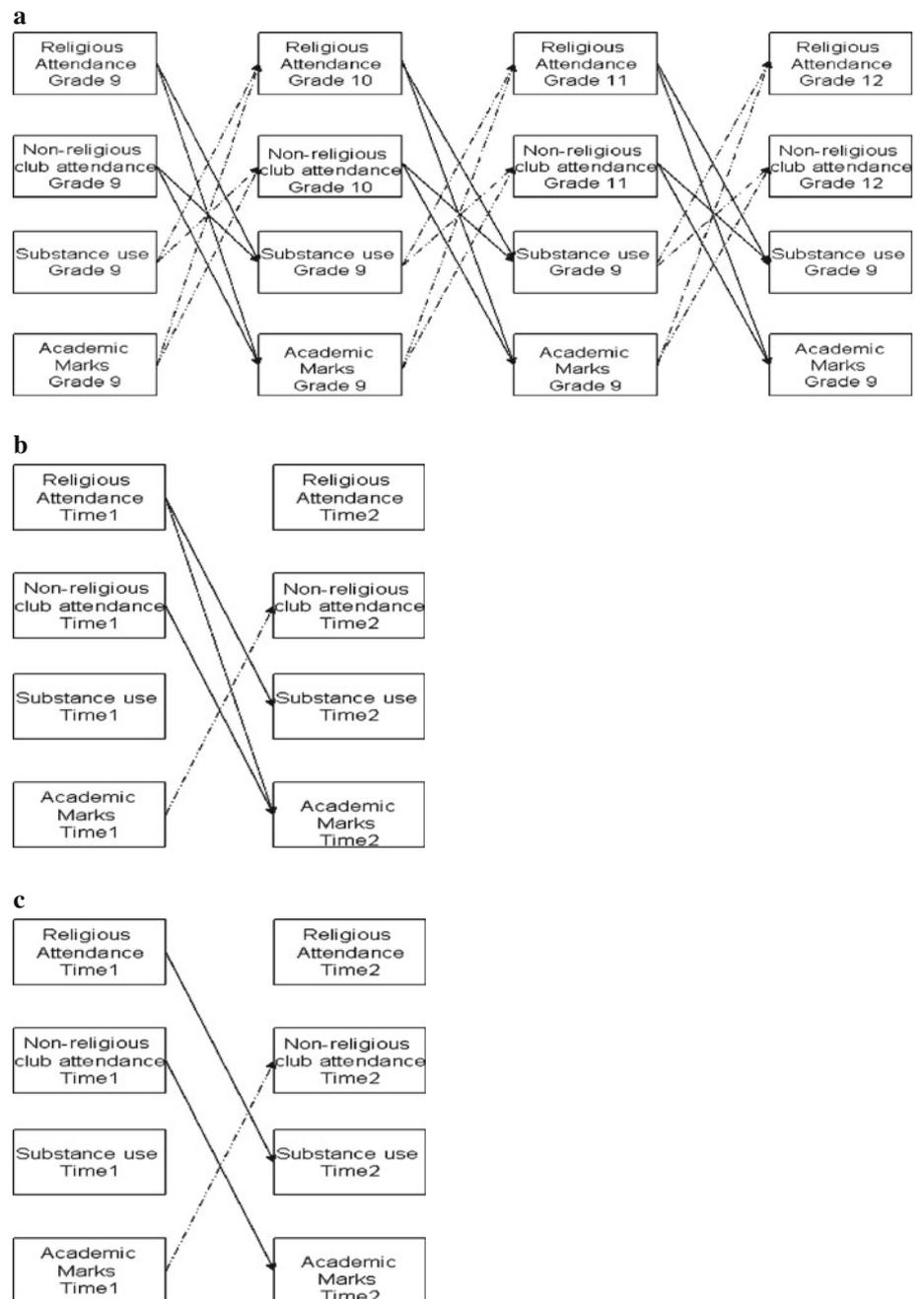
Assessing the Influence of Involvement and Selection Hypotheses Across Time

A model was estimated that included each of the primary variables (religious service attendance, non-religious club involvement, academic marks, and substance use) assessed at each grade. The stability model (Model 1) consisted only of direct paths across grades within each variable (first- and second-lags), as well as the concurrent correlations among all variables. The model had good fit, $\chi^2(76) = 437.3, p < .001, CFI = .97, RMSEA = .035 (.031-.038)$. Another model was then fit (Model 2), which was nested within the stability model, which added the cross-lagged paths that directly assessed the *influence of involvement* and

selection hypotheses (see Fig. 1a). All cross-lagged paths were estimated simultaneously so that the coefficients would reflect the independent effects for religious service attendance after controlling for the effect of non-religious activity involvement, and vice versa. The chi-square difference test of relative fit revealed that the model including the cross-lagged paths had significantly better fit than the stability model, $\chi^2_{diff}(24) = 162.1, p < .001 [CFI = .979, RMSEA = .033 (.029-.032)]$ for the constrained model].

We then assessed whether the pattern of results for the cross-lagged paths was invariant across grade. Invariance was tested by comparing a model in which cross-lagged paths were constrained to be equal across grade to the unconstrained model in which cross-lagged paths were free to vary across grade. The chi-square difference test indicated that the unconstrained model was not a significantly better fit than the constrained model, suggesting that the cross-lagged paths were consistent across the high school years, $\chi^2_{diff}(16) = 17.3, p = .60 [CFI = .98, RMSEA = .029 (.025-.032)]$ for the constrained model]. As the constrained model was the most parsimonious, all further interpretations were based on the constrained model. Cross-lagged paths were then examined to determine the direction of effects among the variables. Figure 1b summarizes the significant paths (note that as paths across each adjacent grade were constrained to be equal, paths are shown for only 2 time points, labeled as Time 1 and Time 2).

Fig. 1 Path analysis models:
a. Full model with all estimated cross-lagged paths;
b. Significant cross-lagged paths prior to addition of covariates;
c. Significant cross-lagged paths after addition of control variables. *Notes:* concurrent associations among constructs within a grade, stability paths across adjacent grade, and the cohort covariate are not shown. Solid lines represent paths assessing *influence of involvement* effects; dashed lines represent paths assessing *selection* effects. For 1b and c, only 2 time points are shown as cross-lagged paths were invariant across the four high school grades



The relative strength of the *influence of involvement* and *selection* hypotheses for religious service attendance versus non-religious activity involvement was assessed in two ways. First, for paths that were significant for both religious service attendance and non-religious activity involvement, the magnitude of the significant cross-lagged paths were compared; significant paths with larger standardized coefficients were considered stronger predictors of the outcome variable. Second, the robustness of the significant cross-lagged paths in the presence of the control variables was examined; paths that remained significant

after the control variables were added were considered to be stronger than paths that became non-significant when control variables were added.

The Influence of Involvement Hypothesis

The *influence of involvement* hypothesis for the relationship between religious service attendance and substance use was supported, consistent with our expectations. Higher levels of religious service attendance predicted lower substance use over time, $\beta = -.05$, $p < .001$, after

controlling for stability over time in substance use and religious attendance. In contrast, there was no support for the *influence of involvement* hypothesis for the relationship between non-religious activities and substance use.

For the relationship between non-religious activities and academic marks, as expected, the *influence of involvement* hypothesis was supported, wherein greater non-religious involvement predicted higher subsequent marks. $\beta = .04$, $p < .001$, after controlling for stability in non-religious attendance and marks. The *influence of involvement* hypothesis was also supported for the relationship between religious service attendance and academic marks, as higher religious service attendance predicted higher marks over time, $\beta = .02$, $p = .03$, after controlling for stability in religious attendance and marks.

The Selection Hypothesis

The *selection* hypothesis was supported only for the association between academic marks and non-religious activity involvement. Higher academic marks predicted greater subsequent non-religious activity involvement, $\beta = .10$, $p < .001$, after controlling for stability in the constructs. All other cross-lagged paths were not significant.

Third Variable Problem

The next step in the analyses involved testing whether the *influence of involvement* and *selection* hypotheses that were supported (i.e., significant cross-lagged paths) were reduced or eliminated by adding the control variables to the model. This step provided an additional way in which to test the strength of the direction of effects (i.e., whether the effects were unique to the variables of primary interest, or, rather, could be explained by the control variables). Correlations were estimated between the control variables and the primary variables (religious service attendance, non-religious club involvement, substance use, and marks) at Time 1, and paths were estimated between the control variables and primary variables at Time 2. The cross-lagged paths remained significant after the control variables were added, with the exception of the paths supporting the *influence of involvement* hypothesis for the relationship between religious service attendance and academic marks. The complete model illustrating the cross-lagged paths that remained significant after the control variables were added is presented in Fig. 1c.

Discussion

Within the Positive Youth Development framework, both religious and non-religious activities have received

attention as environments where developmental assets may be fostered. However, only a limited amount of research has been conducted on the ways by which religious and non-religious activities may be differentially related to psychosocial adjustment—particularly with regard to how these effects may differ over time. The goal of the present study was to extend our previous work (Good and Willoughby 2006; Good et al. 2009) in order to develop a more comprehensive understanding of the associations among religious service attendance versus non-religious club involvement and two indicators of adjustment (substance use and academic achievement). Our focus specifically was on assessing the direction of effects among these variables. We tested two main hypotheses: the *influence of involvement* hypothesis (religious and non-religious activity involvement predict adjustment) and the *selection* hypothesis (adjustment predicts religious and non-religious activity involvement). We also assessed the robustness of these effects across four grades of high school, and after adding control variables.

Results indicated support for the *influence of involvement* hypothesis, in that more frequent involvement in religious activities (but *not* non-religious activities) led to lower levels of substance use over time. This finding is consistent with two-wave studies that have used autoregressive models to assess the impact of religiosity on substance use (Mason and Windle 2002; Nonnemaker et al. 2006). The fact that the cross-lagged paths remained significant after multiple control variables reflecting individual-, friend-, and parent-level characteristics were entered into the model provides a degree of confidence that the effect of religious attendance on substance use was not a spurious association. These results imply, therefore, that there may be something unique to religious service attendance that makes adolescent adherents less likely to engage in substance use. It is particularly interesting that the effect of religious service attendance on substance use was still significant after variables assessing both individuals' and friends' tolerance of deviance/substance use were included as control variables. Presumably, one of the more salient reasons why religiously-involved adolescents would engage in less substance use would be because of their (and their friends') beliefs about the wrongfulness of smoking cigarettes, drinking alcohol, and using marijuana. Steinberg (2007, 2010) has suggested, however, that attitudes or beliefs may not protect against involvement in risky behavior, and the most effective way to reduce risk taking in adolescence may be to reduce *opportunities* for engaging in these behaviors. This argument is based on recent evidence supporting a dual-systems model of adolescent risk-taking (e.g., Paus 2005), where risk behavior is thought to be the result of a slow-maturing *cognitive-control system* (the neural network that controls self-regulatory functions

such as planning and thinking ahead) and a particularly active *socio-emotional system* (the network that drives the desire for thrilling, immediately gratifying experiences such as using substances). Steinberg states that risk taking decreases as the cognitive-control system gradually matures, and, as there may be little that can be done to hasten its maturation, interventions focused on knowledge or attitudes (e.g., religious communities teaching about the wrongness of substance use) are not useful. From the perspective of the dual-systems model, then, perhaps the effect of religious service attendance on substance use found in the present study may be due to reductions in opportunities for risk taking among religiously-involved adolescents. Our results suggest that these reductions in opportunities may involve more than just parental control, as the paths linking religious attendance and substance use were significant after parental control was added as a control variable.

In contrast to the idea that religious activity involvement prevents adolescent substance use because of reduced opportunities for risk-taking, there is some evidence to suggest that religious involvement may actually increase capacities for self-control and self-regulation. In a comprehensive review, McCullough and Willoughby (2009) found support for the suggestion that religion may promote self-control and self-regulation, and the links that have been found between religiousness and health (including lower substance use) may be partially due to self-control and self-regulation. In light of the growing support for the dual-systems model (Steinberg 2007), future research should explore whether the effect of religious involvement on substance use is related to improvements in self-regulatory and self-control capabilities (i.e., maturation in the cognitive-control system) or reductions in opportunities to engage in substance use, or both.

Although other longitudinal studies have found support for the *influence of involvement* hypothesis for the relationship between religious attendance and substance use, the present study was unique in that it surveyed adolescents across all the high school grades (i.e., grades 9 through 12), and therefore, could assess across-time differences in these effects. While we expected the effect of religious service attendance on adjustment would differ across the high school years (for substance use in particular), significant differences in cross-lagged paths across high school grades were not found. Because this is only the first study of which the authors are aware to have assessed across-time differences in cross-lagged effects among these variables (except see Burkett and Warren 1987), future research should replicate these findings in order to establish whether across-time effects are consistent. It also would be beneficial for future research to examine a greater range of psychosocial adjustment variables. It may be that the

effects are consistent across high school grades for some variables (e.g., substance use and academic achievement), but differ across time for other variables.

It is interesting that there were no associations between non-religious activity involvement and substance use. Other studies often have reported that extracurricular activity participation is associated with lower substance use (e.g., Barber et al. 2001). The vast majority of studies that have looked at this association, however, have not controlled for the effect of religious involvement (although see Fauth et al. 2007). Therefore, it is possible that some of the associations found between non-religious club involvement and substance use could be explained (at least partially) by the fact that religiously-involved adolescents are overrepresented in non-religious clubs (e.g., Youniss et al. 1999), again highlighting the importance of controlling for religious involvement when examining the impact of structured clubs on adjustment.

It was notable that the *influence of involvement* hypothesis for the relationship between religious activity involvement and academic marks was only weakly supported, and reduced to non-significance when the control variables were added. This finding is inconsistent with studies by Glanville et al. (2008) and Muller and Ellison (2001) who found support for the *influence of involvement* hypothesis for the relationship between religious involvement and academic success even after accounting for several control variables. Differences between the present study and Muller and Ellison's results may be due to the variables they used to assess school success (cutting class and time spent in homework). Cutting fewer classes and spending more time on homework are behaviors that may be more strongly related to religiosity than academic marks, as they reflect effort and prosocial attitudes rather than achievement, per se. It is puzzling, however, that our results were not more similar to Glanville et al., who, like us, assessed achievement and also controlled for extracurricular club participation. These differences may be related to the fact that the present study assessed achievement via self-reported marks, whereas Glanville et al. used students' GPA from their transcripts. Because Glanville et al. used a more objective measure of achievement, the results of the present study may be a more conservative estimation of the cross-lagged relationships between religious attendance and academic success. We do not claim, therefore, that our results imply that there are no academic-related effects of religious attendance, but, rather, when considering both religious and non-religious activities simultaneously, the strength of the relationship between non-religious activities and marks may be more robust than the relationship between religious activities and marks. It is possible that previous links that have been found in the literature between religious activity involvement and

academic success may be (at least partially) explained by involvement in non-religious activities.

It was surprising that the *selection* hypothesis for the relationship between religious service attendance and substance use received no support. Previous studies have found at least partial support for the *selection* hypothesis (e.g., Steinman and Zimmerman 2004), but this difference may be partially explained by the fact that the strength of the association between individuals' religiosity and deviant behavior is thought to be weaker in contexts where community-level religiosity is low (Regnerus 2003). All of the studies that have been conducted on this topic have used US samples, whereas the present study was conducted with Canadian youth. On average, US citizens are more religious (i.e., more involved in religious institutions) than Canadians. 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. The relationship between religious attendance and substance use, therefore, may have been attenuated in this Canadian sample, relative to American samples. Another possibility is that, in this sample, the selection effects may have occurred earlier than grade nine (i.e., adolescents with certain characteristics may have already stopped attending religious services by grade nine). Future research should explore selection effects in a younger sample of Canadian adolescents.

Finally, consistent with past research (e.g., Fredricks and Eccles 2006; Gardner et al. 2008), we found support for both the *influence of involvement* and *selection* hypotheses when examining the association between non-religious involvement and academic success over time. Not only did non-religious activity involvement predict higher grades over time, but higher grades also predicted more non-religious activity involvement over time. Adolescents who are involved in non-religious activities acquire skills related to academic tasks (e.g., debating), and so it is no surprise that they achieve greater academic success over time. At the same time, selection effects also play a significant role. Most likely, adolescents with lower grades have fewer opportunities than higher achieving students to become involved in non-religious activities.

Limitations

One limitation of the present study is that religious activity involvement was measured by one item (frequency of attendance at religious services). Presumably, the effects of religious service attendance would be stronger for adolescents who had a strong personal faith. Our results, therefore, may be a conservative estimate of the impact of

religiosity. Similarly, because we did not include religiously-based youth groups within our measure of religious service attendance, it is possible such groups may have been subsumed within a community-based club. However, the frequency of attendance at religious youth groups is typically strongly correlated with the frequency of attendance at religious services (e.g., Smith et al. 2002). Also, to diminish the possibility of this limitations' strongly influencing our results, we examined the independent effects of both religious services and community/school clubs by simultaneously controlling for the effect of the other. Another shortcoming stems from our reliance on self-report measures. In particular, it would have been beneficial to have measured academic success via students' school records. The sample from which the population was drawn also was fairly homogenous in terms of religion/ethnicity. Further, because students' religious affiliations were not known, differences in the results by religious affiliation could not be examined. For example, some religious affiliations may be more likely to denounce alcohol use than others. In addition, although Canadians are less religious than Americans on average, there are pockets/regions where religiosity is high (Clark 2003). Present results, therefore, may generalize to adolescents of other nationalities from primarily Caucasian/European backgrounds living in regions where religiosity is low and religious institutions play minor roles in public life (e.g., US Pacific Northwest; Silk 2008). Finally, given that standardized path coefficients of .10 are typically seen as small effects in the social sciences, the structural paths that were significant in the present study were all small in magnitude. However, these effect sizes are common in cross-lagged models with high stability coefficients between adjacent waves of data and when accounting for concurrent associations among variables. In this case, small effects would be expected. However, small effects are not necessarily trivial effects—particularly the effects that remained significant in the presence of a substantial number of control variables. Importantly, the magnitude of effects is consistent with the other studies that have used similar models (e.g., Fredricks and Eccles 2006; Mason and Windle 2002).

Conclusions

The present study offers an important longitudinal examination of the differences in the direction of effects when assessing the relationship between religious service attendance versus non-religious club involvement and two commonly-used indicators of adolescent adjustment (academic success and substance use). The findings suggest that religious service attendance is uniquely linked to lower levels of substance use over time, supporting the *influence*

of involvement hypothesis. In contrast, non-religious club involvement was uniquely related to higher academic achievement over time, but academic achievement was also related to higher levels of non-religious club involvement over time, supporting both the *influence of involvement* and *selection* hypotheses. Results were consistent across all high school grades. These findings support our proposition that it is important for researchers to examine religious activities independently from non-religious activities, and highlights the importance of examining these issues longitudinally. Importantly, these results suggest that religious activities are not just another “club” in which adolescents participate, but rather, that different developmental assets may be fostered by religious activities as compared to non-religious activities.

Acknowledgments The second author acknowledges funding received from the Social Sciences and Humanities Research Council of Canada.

References

- Albertsen, E. J., O'Connor, L., & Berry, J. W. (2006). Religion and interpersonal guilt: Variations across ethnicity and spirituality. *Mental Health, Religion, & Culture*, *9*, 67–84.
- Armsden, G. C., & Greenberg, M. T. (1987). The inventory of parent and peer attachment: Individual differences and their relationship to psychological well-being in adolescence. *Journal of Youth and Adolescence*, *5*, 427–453.
- Barber, B. L., Eccles, J. S., & Stone, M. R. (2001). Whatever happened to the jock, the brain, and the princess? Young adult pathways linked to adolescent activity involvement and social identity. *Journal of Adolescent Research*, *16*, 429–455.
- Bibby, R. W. (2009). *The emerging millennials: How Canada's newest generation is responding to change and choice*. Lethbridge, AB: Project Canada Books.
- Burkett, S. R., & Warren, B. O. (1987). Religiosity, peer associations, and adolescent marijuana use: A panel study of underlying causal structures. *Criminology*, *25*, 109–131.
- Busseri, M. A., Rose-Krasnor, L., Willoughby, T., & Chalmers, H. (2006). A longitudinal examination of breadth and intensity of youth activity involvement and successful development. *Developmental Psychology*, *42*, 1313–1326.
- Clark, W. (2003). Pockets of belief: Religious attendance patterns in Canada. *Canadian Social Trends*, *68*(Spring), 1–5.
- Costa, F. M., Jessor, R., & Turbin, M. S. (1999). Transition into adolescent problem drinking: The role of psychosocial risk and protective factors. *Journal of Studies on Alcohol*, *60*, 480–490.
- Donovan, J. E., Jessor, R., & Costa, F. M. (1988). Syndrome of problem behavior in adolescence: A replication. *Journal of Consulting and Clinical Psychology*, *56*, 762–765.
- Dotterer, A. M., McHale, S. M., & Crouter, A. C. (2007). Implications of out-of-school activities for school engagement in African American adolescents. *Journal of Youth and Adolescence*, *36*, 391–401.
- Dworkin, J. B., Larson, R., & Hansen, D. (2003). Adolescents' accounts of growth experiences in youth activities. *Journal of Youth and Adolescence*, *32*, 17–26.
- Fauth, R. C., Roth, J. L., & Brooks-Gunn, J. (2007). Does the neighborhood context alter the link between youth's after-school time activities and developmental outcomes? A multilevel analysis. *Developmental Psychology*, *43*, 760–777.
- Feldman, A. F., & Matjasko, J. L. (2007). Profiles and portfolios of adolescent school-based extracurricular activity participation. *Journal of Adolescence*, *30*, 313–322.
- Feldman, B. J., Masyn, K. E., & Conger, R. D. (2009). New approaches to studying problem behaviors: A comparison of methods for modeling longitudinal, categorical adolescent drinking data. *Developmental Psychology*, *45*, 652–676.
- Fredricks, J. A., & Eccles, J. S. (2006). Extracurricular involvement and adolescent adjustment: Impact of duration, number of activities, and breadth of participation. *Applied Developmental Science*, *10*, 132–146.
- Fredricks, J. A., & Eccles, J. S. (2008). Participation in extracurricular activities in the middle school years: Are there developmental benefits for African American and European American youth? *Journal of Youth and Adolescence*, *37*, 1029–1043.
- Gardner, M., Roth, J., & Brooks-Gunn, J. (2008). Adolescents' participation in organized activities and developmental success 2 and 8 years after high school: Do sponsorship, duration, and intensity matter? *Developmental Psychology*, *44*, 814–830.
- Glanville, J., Sikkink, D., & Hernandez, E. (2008). Religious involvement and educational outcomes: The role of social capital and extracurricular participation. *The Sociological Quarterly*, *49*, 105–137.
- Good, M., & Willoughby, T. (2006). The role of spirituality versus religiosity in adolescent psychosocial adjustment. *Journal of Youth and Adolescence*, *35*, 39–53.
- Good, M., & Willoughby, T. (2007). The identity formation experiences of church-attending rural adolescents. *Journal of Adolescent Research*, *22*, 387–412.
- Good, M., Willoughby, T., & Fritjers, J. (2009). Just another club? The distinctiveness of the relation between religious service attendance and adolescent psychosocial adjustment. *Journal of Youth and Adolescence*, *38*, 1153–1171.
- Hoffman, J. P. (2006). Extracurricular activities, athletic participation, and adolescent alcohol use: Gender-differentiated and school-contextual effects. *Journal of Health and Social Behavior*, *47*, 275–290.
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, *6*(1), 1–55.
- Hunsberger, B., Pratt, M., & Pancer, S. M. (2001). Adolescent identity formation: Religious exploration and commitment. *Identity: An International Journal of Theory and Research*, *1*, 356–386.
- King, P. E., & Furrow, J. L. (2004). Religion as a resource for positive youth development: Religion, social capital, and moral outcomes. *Developmental Psychology*, *40*, 703–713.
- Kline, R. B. (2005). *Principles and practice of structural equation modeling* (2nd ed.). New York, NY: Guilford.
- Larson, R. W., Hansen, D. M., & Moneta, G. (2006). Differing profiles of developmental experiences across types of organized youth activities. *Developmental Psychology*, *42*, 849–863.
- Lerner, R. M., Dowling, E. M., & Anderson, P. M. (2003). Positive youth development: Thriving as a basis of personhood and civil society. *Applied Developmental Science*, *7*, 172–180.
- Levenson, M. R., Aldwin, C. M., & D'Mello, M. (2005). Religious development from adolescence to middle adulthood. In R. F. Paloutzian & C. L. Park (Eds.), *Handbook of the psychology of religion and spirituality* (pp. 144–161). New York, NY: Guilford Press.
- Little, R. J. A., & Rubin, D. B. (2002). *Statistical analysis with missing data* (2nd ed.). Hoboken, NJ: Wiley and Sons.
- Little, T. D., Card, N. A., Preacher, K. J., & McConnell, E. (2009). Modeling longitudinal data from research on adolescence. In

- R. M. Lerner & L. Steinberg (Eds.), *Handbook of adolescent psychology* (pp. 15–54). Hoboken, NJ: John Wiley & Sons.
- Mahoney, J. L. (2000). School extracurricular activity participation as a moderator in the development of antisocial patterns. *Child Development, 71*, 502–516.
- Mahoney, J. L., & Cairns, R. B. (1997). Do extracurricular activities protect against early school dropout? *Developmental Psychology, 33*, 241–253.
- Mahoney, J. L., Cairns, B. D., & Farmer, T. W. (2003). Promoting interpersonal competence and educational success through extracurricular activity participation. *Journal of Educational Psychology, 95*, 409–418.
- Mason, W. A., & Windle, M. (2002). A longitudinal study of the effects of religiosity on adolescent alcohol use and alcohol-related problems. *Journal of Adolescent Research, 17*, 346–363.
- McCullough, M. E., & Willoughby, B. L. B. (2009). Religion, self-regulation, and self-control: Associations, explanations, and implications. *Psychological Bulletin, 135*, 69–93.
- Muller, C., & Ellison, C. G. (2001). Religious involvement, social capital, and adolescents' academic progress: Evidence from the national education longitudinal study of 1988. *Sociological Focus, 34*, 155–183.
- Nonnemaker, J., McNeely, C. A., & Blum, R. W. (2006). Public and private domains of religiosity and adolescent smoking transitions. *Social Science and Medicine, 62*, 3084–3095.
- Paus, R. (2005). Mapping brain maturation and cognitive development during adolescence. *Trends in Cognitive Science, 9*, 60–68.
- Regnerus, M. D. (2003). Moral communities and adolescent delinquency: Religious contexts and community social control. *The Sociological Quarterly, 44*, 523–554.
- Regnerus, M. D., & Elder, G. H. (2003). Religion and vulnerability among low-risk adolescents. *Social Science Research, 32*, 633–658.
- Regnerus, M. D., & Smith, C. (2005). Selection effects in studies of religious influence. *Review of Religious Research, 47*, 23–50.
- Regnerus, M. D., & Uecker, J. E. (2006). Finding faith, losing faith: The prevalence and context of religious transformations during adolescence. *Review of Religious Research, 47*, 217–237.
- Schafer, J. L., & Graham, J. W. (2002). Missing data: Our view of the state of the art. *Psychological Methods, 7*, 147–177.
- Silk, M. (2008). *One nation, divisible: How regional religious differences shape American politics*. New York: Rowman & Littlefield.
- Smith, C. (2003a). Theorizing religious effects among American adolescents. *Journal for the Scientific Study of Religion, 42*, 17–30.
- Smith, C. (2003b). Religious participation and network closure among American adolescents. *Journal for the Scientific Study of Religion, 42*, 259–267.
- Smith, C., & Denton, M. L. (2005). *Soul searching: The religious and spiritual lives of American teenagers*. New York, NY: Oxford University Press.
- Smith, C., Denton, M. L., Faris, R., & Regnerus, M. (2002). Mapping American adolescent religious participation. *Journal for the Scientific Study of Religion, 41*, 597–612.
- Soenens, B., Vansteenkiste, M., Lens, W., Luyckx, K., Goossens, L., Bevers, W., et al. (2007). Conceptualizing parental autonomy support: Adolescent perceptions of promotion of independence versus promotion of volitional functioning. *Developmental Psychology, 43*, 633–646.
- Statistics Canada. (2001a). Population by ethnic origin. Retrieved 6 April 2003. <http://www12.statcan.ca>.
- Statistics Canada. (2001b). Religion and sex for population, for Canada. Retrieved 3 July 2008. www12.statcan.ca.
- Stattin, H., & Kerr, M. (2000). Parental monitoring: A reinterpretation. *Child Development, 71*, 1072–1085.
- Steinberg, L. (2007). Risk taking in adolescence: New perspectives from brain and behavioral science. *Current Directions in Psychological Science, 16*, 55–59.
- Steinberg, L. (2010). A dual-systems model of adolescent risk-taking. *Developmental Psychobiology, 52*, 216–224.
- Steinman, K. J., & Zimmerman, M. A. (2004). Religious activity and risk behavior among African American adolescents: Concurrent and developmental effects. *American Journal of Community Psychology, 33*, 151–161.
- Windle, M., & Lerner, R. M. (1986). Reassessing the dimensions of temperamental individuality across the life span: The Revised Dimensions of Temperament Survey (DOTS—R). *Journal of Adolescent Research, 1*, 213–229.
- Wood, D., Larson, R. W., & Brown, J. R. (2009). How adolescents come to see themselves as being more responsible through participation in youth programs. *Child Development, 80*, 295–309.
- Youniss, J., McLellan, J. A., Su, Y., & Yates, M. (1999). The role of community service in identity development: Normative, unconventional, and deviant orientations. *Journal of Adolescent Research, 14*, 248–261.

Author Biographies

Marie Good is a PhD Candidate in Developmental Psychology at Brock University. Her research interests include adolescent religion and spirituality, adolescent identity development, and youth risk-taking.

Teena Willoughby is a Professor in the Department of Psychology. Her research interests include adolescent development, particularly with regard to resilience, academic achievement, risk behaviours, and media/technology influences on lifestyle choices. Funding for this longitudinal project was provided by the Social Sciences and Humanities Research Council of Canada to Teena Willoughby.