Published in final edited form as:

Alcohol. 2019 June ; 77: 41–48. doi:10.1016/j.alcohol.2018.09.007.

Contrasting the Effects of Harmonious and Obsessive Passion for Religion on Stress and Drinking: Give me that Old Time Religion ... and a Beer.

Mary M. Tomkins, Clayton Neighbors, and Mai-Ly N. Steers

University of Houston

Abstract

Religiousness has been a consistent protective factor against problem drinking. Religiousness is also positively related to some domains of mental health (Koenig, 2009). We propose that Vallerand and Houlfort's (2003) theory of passion, which includes two different approaches to any given activity, might offer a more nuanced understanding of the relationship between religiousness and alcohol use. The current study longitudinally assessed the relationships among harmonious and obsessive passion for religion, alcohol-related problems, and mental health. We hypothesized that the relationship between religious passion and problem drinking would be mediated by mental health as assessed by perceived stress and satisfaction with life. Participants included 707 college students (54.9% female) who were assessed at three time points at three month intervals. Mediation analyses revealed that harmonious passion for religious beliefs and practices was negatively associated with drinking problems through perceived stress, while obsessive passion for religious beliefs and practices was positively associated with drinking problems through perceived stress. Harmonious passion for religious beliefs and practices can be conducive to better mental health and less problematic alcohol use, while obsessive passion can have the opposite effect. This study provides a stepping-stone for future research into the effects of harmonious and obsessive passion for religious beliefs and practices in the context of addictive behaviors.

Keywords

religiousness; passion; alcohol; college students

The present paper was designed to examine associations among passion for religious beliefs and practices, mental health, and problematic drinking. Past research has distinguished two types of passion: harmonious and obsessive (Vallerand & Houlfort, 2003). Both types of passion have been associated with higher levels of engagement, but result in differential outcomes in multiple realms. Domains in which passion have been examined include: a variety of leisure activities (Stenseng et al., 2011), video games (Przybylski et al., 2009),

Correspondence concerning this article should be addressed to Mary M. Tomkins, Department of Psychology, University of Houston, 3695 Cullen Boulevard, Houston, TX 77204, mtomkins@uh.edu.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

online shopping (Wang & Yang, 2008), exercise (Stenseng et al., 2015), gambling (Rousseau et al., 2002), and marijuana and alcohol use (Steers et al., 2015). Passion has not yet been considered with respect to religion, despite its conceptual relevance to previously considered typologies related to religious orientations and motivations. Given research relating passion to mental health (Mageau et al., 2005) and drinking outcomes (Steers et al., 2015), and the consistent protective effect of religion on drinking behaviors, (e.g., Burke et al., 2014, Koenig et al., 2012, Meyers, Brown, Grant, & Hasin, 2017) the examination of the associations between these three constructs represents a logical next step.

Harmonious and Obsessive Passion

Overall, Vallerand and Houlfort (2003) describe passion as a strong disposition toward an activity that someone likes or loves, that they find valuable, and in which they invest their time and energy. Furthermore, Vallerand et al. (2003) went on to describe two types of passion, which are differentiated from one another based on how well the passionate activity is integrated into a person's identity or core self. Harmonious passion comes from a more autonomous internalization process. It is referred to as "harmonious" because the activity of interest represents a significant, yet not overly consuming, aspect of the person's identity or core self; thus, the activity is well-integrated into the person's life (Vallerand et al., 2003). Obsessive passion, on the other hand, is a result of a controlled internalization of the activity. A person who feels obsessive passion for an activity has an uncontrollable urge to engage in the activity due to internal or external pressures (e.g., guilt, societal pressure, irresistible desire). An obsessively passionate person is likely to have difficulty regulating the activity, is more likely to be rigid and defensive regarding their involvement in it, and more likely to find it at odds with other aspects of their identity. Difficulty regulating the activity could be because of external pressures (e.g., social acceptance) or from internal pressures (e.g., self-esteem or a sense of irresistible excitement dependent on that particular activity) (Vallerand et al., 2003). While both types of passion reflect enjoyment or positive associations with the activity, harmonious passion is typically associated with more positive affect and healthy persistence whereas obsessive passion has been related to negative affect, aggressive behavior, compulsive activity engagement, and frustration (Philippe et al., 2009; Vallerand et al., 2003; Zhang et al., 2014).

People may feel passionate about a variety of activities. For example, a person could experience harmonious or obsessive passion for playing video games (Przybylski et al., 2009), exercise (Stenseng et al., 2015), or for online shopping (Wang & Yang, 2008). More importantly, people express both types of passion for addictive substances and behaviors, and the different types of passion express themselves differently in the maintenance and cessation of those behaviors. Two studies found both harmonious and obsessive passion to be positively associated with gambling, but harmonious passion was associated with more positive psychological outcomes (e.g., enjoyment, challenge, control) whereas obsessive passion was associated with negative outcomes (e.g., gambling larger sums, feelings of guilt, and perceptions of being judged by others; Mageau et al., 2005; Rousseau et al., 2002). Specifically in relation to substance use, higher levels of harmonious passion for alcohol predicted higher levels of alcohol consumption (Steers et al., 2015), but lower levels of alcohol problems. Conversely, greater obsessive passion was associated with higher levels of

drinking and alcohol problems. Moreover, both passions were positively correlated to marijuana use. However, harmonious passion for marijuana was related to higher levels of marijuana use than obsessive passion, but there was no significant difference between obsessive and harmonious passion in terms of predicting marijuana problems (Steers et al., 2015). There is currently no other research on the effects of passion for religion in relation to substance use.

Studies have examined the association between religious orientation and alcohol use (Galen & Rogers, 2004; Patock-Peckham, Hutchinson, Cheong, & Naghoshi, 1998), and passion has often been conceptualized as resembling intrinsic and extrinsic motivation (Bélanger et al., 2013). The primary differences between the concepts of motivation and passion are that passionate activities are considered central to identity, while intrinsically and extrinsically motivated activities may not be. Allport (1963) identified two types of religious orientation, extrinsic and intrinsic, which have remained central constructs in the literature (e.g., Kirkpatrick & Hood, 1990; Parenteau, Waters, Cox, Patterson, & Carr, 2017; Singh & Bano, 2017). Those who are extrinsically motivated use religion as a tool in order to reach some outward goal. Extrinsic motivation has some overlap with obsessive passion, but obsessive passion may also involve inflexible adherence to internalized rules, rituals, and inability to cognitively disengage when attention is needed elsewhere. On the other hand, intrinsic motivation is motivated by religion being internally rewarding. That is, the experience of religion is enjoyable, regardless of additional rewards. Harmonious passion also emphasizes balance and ability to disengage when attention is needed elsewhere. Thus, while passion shares some aspects of previous conceptualizations, there are also specific aspects that make it unique with respect to religion. In this way, harmonious and obsessive passion for religion might differentially predict alcohol use due to the different ways they might affect mental health.

Religiousness and Alcohol Use

One connection that has been well-documented is the association of religiousness with less problematic drinking. For example, across three time points, in a national study of women ($N = 11,169$) religiousness was positively associated with lifetime alcohol abstinence and, more importantly, served as a protective factor against hazardous drinking and drug use (Drabble, Trocki, & Klinger, 2016). These findings have been consistent in the literature (e.g. Astin et al., 2010, Burke et al., 2014, Rew & Wong, 2006). In their review, Koenig et al. (2012) determined that most studies examining the association between religiousness or spirituality and alcohol consumption reported a significant, negative relationship. Perhaps, religiousness or spirituality has been robustly found to be negatively associated with drinking because many religions prohibit drunkenness and discourage, either implicitly or explicitly, alcohol consumption of any kind. But it is also likely that religiousness is indirectly associated with drinking practices through its positive associations on mental health. That is, religion may buffer against negative health outcomes which makes people less likely to drink in order to deal with life's stressors. In order to explore these associations, the current study investigated the relationships between passion for religious beliefs and practices, mental health, and drinking outcomes.

Religiousness and Mental Health Outcomes

In general, religion has been associated with lower levels of depression, suicide, anxiety, and substance use (for a review, see Koenig, 2009; Koenig & Larson, 2001). It has also been associated with lower levels of stress (Park, 2005; Pollard & Bates, 2004). Furthermore, practicing religious beliefs has been associated with increased levels of satisfaction with life and meaning in life (Hunsberger, 1985; Berthold & Ruch, 2014). These findings indicate that religion has an overall positive effect on several domains of mental health; thus, it may buffer against negative health outcomes. However, we posit that perhaps not all approaches to religion are necessarily healthy or result in positive outcomes. One of the determining factors as to whether religious engagement results in positive outcomes may be an individual's approach to religion, that is, whether individuals have harmonious or obsessive passions for religion and religious practices.

Mental Health and Alcohol Use

On the other hand, worse mental health is consistently associated with increased alcohol use and alcohol problems (Conway, Swendsen, Husky, Jian-Ping, & Merikangas, 2016). Levels of stress have been positively associated with alcohol use (Frone, 2015) and alcohol problems (Camatta & Nagoshi, 1995). Additionally, increased satisfaction with life has been associated with decreased alcohol use and decreased problematic alcohol use (Fergusson et al., 2015; Strine, Chapman, Balluz, Moriarty, & Mokdad, 2008; Zullig, Valois, Huebner, Oeltmann, & Drane, 2001). These studies demonstrate that mental health outcomes are contributing factors to alcohol use and problematic alcohol use.

The present study

The present study examined passion for religious beliefs and practices in relation to alcohol use, alcohol problems, perceived stress, and satisfaction with life. This study incorporates satisfaction with life as a global measure of positive outcomes. Additionally, perceived stress has been found to be related to negative affect (Clark, & Watson, 1988; Kanner, Coyne, Schaefer, & Lazarus, 1981; Wills, 1986), compulsive activity engagement (e.g., van de Aa et al. 2009; Davis, Katzman, Kirsch, 1999), and frustration (e.g., Miller & Green, 1985). We hypothesized that harmonious passion for religious beliefs and practices would be positively related to satisfaction with life over time and negatively associated with perceived stress over time (**H1**). Harmonious passion for religious beliefs and practices is theoretically better integrated into one's daily life; as such, we expected it to be associated with more positive mental health outcomes. On the other hand, because obsessive passion leaves little room for integration with other parts of life, an inability to disengage, and a lack of flexibility, we hypothesized that obsessive passion for religious beliefs and practices would be negatively related to satisfaction with life and positively associated with perceived stress over time (**H2**). Moreover, we hypothesized that harmonious passion for religious beliefs would be negatively related to levels drinking and alcohol problems, while obsessive passion for religious beliefs and practices would be positively related to alcohol consumption and alcohol-related consequences (**H3**) and that satisfaction with life and perceived stress would mediate the associations of harmonious and obsessive passion with alcohol consumption and

alcohol consequences. That is, we expected to find significant indirect effects of harmonious and obsessive passion on alcohol consumption and alcohol- consequences through perceived stress and satisfaction with life (**H4**). Finally, we were also interested in examining whether harmonious passion for religion might buffer deleterious effects of stress and low satisfaction with life on alcohol consumption and alcohol-related consequences, and, whether greater obsessive passion might amplify them. Thus, we were interested in examining harmonious and obsessive passion as moderators of the associations between mental health and drinking outcomes.

Method

Participants.

Participants included 707 undergraduates between the ages of 18 and 27 ($M = 21.51$, $SD = 1.97$, 54.9% female) from a large southwestern university who were recruited as part of a larger alcohol-related intervention trial. The original sample included 959 baseline participants; however, 73 were excluded after failing to correctly answer two of three check questions. One-hundred and seventy-nine participants who reported no passion for religious beliefs and practices at baseline were also excluded.

Procedure.

In order to qualify for the study, respondents were prescreened for heavy drinking criteria (4/5 drinks for women/men respectively consumed in at least one sitting in the previous month). Participants received \$25 for each of three assessments at baseline (time 1), three-months (time 2), and six-months (time 3). Data for this study were drawn from all three time points.

Measures

Passion for religious beliefs and practices.—The Passion Scale (Vallerand et al., 2003), was adapted to measure participant's levels of harmonious ($\alpha = .94$) and obsessive passion ($\alpha = .94$) for religion. Each subscale contains seven items and was mean scored. Example items included: "Practicing religious or spiritual beliefs reflects the qualities I like about myself" (harmonious passion), and "I cannot live without practicing religious or spiritual beliefs" (obsessive passion). Participants indicated degree of agreement with items on a 7-point scale (1 = *Strongly Disagree*, 7 = *Strongly Agree*).

Mental Health Outcomes

Perceived Stress.

The Perceived Stress Scale (Cohen et al., 1983) is a 10-item measure which determines participant's global stress levels in the last month. The four positive items on the scale were reverse-scored and then the whole scale was mean-scored ($\alpha = .85$). A sample item included: "In the last month, how often have you felt that you were unable to control the important things in your life?" Items were ranked on a 5-point scale (0 = *Never*, 4 = *Very Often*).

Satisfaction with Life.

The Satisfaction with Life scale (Diener et al., 1985) is a short 5-item measure which was designed to measure participants' overall satisfaction with life. The scale included: "In most ways my life is close to ideal." Items were ranked on a 7-point scale (1 = *Strongly Disagree*, 7 = *Strongly Agree*) and are mean-scored ($\alpha = .87$).

Alcohol-related Outcomes

Alcohol consumption.—The Timeline Follow-Back (TLFB; Sobell & Sobell, 1996) was utilized to assess typical alcohol use over the past month at each of the three time points. Participants were asked to report their daily drinking on each day over the last 30 days.

Alcohol-related consequences.—The Rutgers Alcohol Problem Index (RAPI; White & Labouvie, 1989) is a 25-item scale used to examine negative consequences and problems associated with drinking. Because we assessed participants' alcohol-related problems at three-month intervals, participants were asked to report on their alcohol-related consequences over a three-month period. The scale determined how many times a particular negative event occurred while consuming alcohol or due to drinking. Example items included the following: "Had withdrawal symptoms, that is, felt sick because you stopped or cut down on drinking?" and "Had a fight, argument or bad feelings with a friend?" Items were measured on a 5-point scale (0 = *Never*, 4 = *More than 10 times*) and were mean-scored ($\alpha = .91$).

Results

Analyses were conducted using generalized linear models using maximum likelihood estimation. Correlated outcomes are a defining characteristic of longitudinal data. When they are of interest, variances and covariances within individuals are often modeled as random effects. Standard errors for model parameters are then adjusted to account for these effects (cf., Atkins et al., 2013). An alternative approach, which also provides accurate estimates of parameter variability in correlated outcomes, is the use of robust standard errors. As the within-person variances and covariances (i.e., random effects) were not of specific interest, we used marginal models with robust standard errors adjusted for correlations due to clustering of outcomes within individuals (similar to generalized estimating equations; cf., Baldwin et al., 2013). Analyses were conducted in STATA15 (Statacorp, 2017).

Both drinking outcomes (drinks consumed past month and alcohol problems) had non-normal distributions and were specified as negative binomial distributions (Hilbe, 2011). Mental health variables were approximately normally distributed and were specified as such. Individual trajectories revealed average decreases in drinking outcomes over time including average drinks per week, $z = -5.54$, $p < .001$, drinks in the past month, $z = -7.71$, $p < .001$, and alcohol problems, $z = -5.54$, $p < .001$. With respect to mental health variables, neither satisfaction with life nor perceived stress changed significantly over time. In contrast, obsessive passion for religious beliefs and practices increased, $z = 3.33$, $p = .001$, and harmonious passion decreased, $z = -5.33$, $p < .001$ over time.

We next examined whether drinking outcomes varied as a function of harmonious and obsessive passion for religious beliefs and practices and mental health over time. Outcomes were lagged so that time 2 and 3 drinking and consequences were matched to time 1 and 2 observations of predictors (harmonious and obsessive passion, perceived stress, and satisfaction with life), respectively. Consistent with our theoretical model, analyses were conducted hierarchically such that passion variables were entered at step 1 and mental health variables were added at step 2. Results of the negative binomial regression analyses with robust clustered standard errors are presented in Table 1. Parameter estimates for negative binomial models are log linked such that parameter estimates equate to expected values of the dependent variable in natural log units. Exponentiated values of parameter estimates are rate ratios, which represent percent change subtracted from one. For example, in Table 1, the expB value for harmonious passion as a predictor of consumption is .87. Therefore, a unit increase in harmonious passion is associated with a 13% decrease in consumption ($.87 - 1.00 = -.13$). Similarly, in predicting alcohol problems at step 2, the expB value of perceived stress is 1.39, which translates to a 39% increase in problems for each unit increase in perceived stress (See Figure 1).

Next, we examined associations between passion and mental health (Table 2). Harmonious passion was negatively associated with perceived stress, whereas obsessive passion was associated with higher levels of perceived stress. Harmonious passion was associated with greater satisfaction with life, whereas obsessive passion was unrelated to satisfaction with life.

Mediation of associations between passion and drinking outcomes were evaluated using parameters from results in Tables 1 and 2 to test indirect effects. Indirect effects were evaluated using the R Mediation macro (Tofighi & MacKinnon, 2011). Examination of the indirect effect of obsessive passion on alcohol problems through perceived stress was significant. For $\hat{a} = 0.045$ ($SE = 0.017$) and $b^{\wedge} = 0.33$ ($SE = 0.107$), the indirect effect estimate was 0.015 ($SE = 0.008$). The distribution of the product of coefficients method, accounting for the correlation between obsessive passion and alcohol problems, yielded 95% CI [0.002, 0.033], which did not include zero. The indirect effect of harmonious passion on alcohol problems through perceived stress was also significant. For $\hat{a} = -0.054$ ($SE = 0.017$) and $b^{\wedge} = 0.33$ ($SE = 0.107$), the indirect effect estimate was -0.018 ($SE = 0.008$). The distribution of the product of coefficients method, controlling for the correlation between harmonious passion and alcohol problems yielded 95% CI $[-0.037, -0.004]$, which did not include zero.

In addition to evaluating mental health outcomes as mediators of associations between religious passion and alcohol consumption and alcohol problems, we also examined religious passion as moderators of associations between mental health outcomes and alcohol problems. In recent years greater recognition has been given to models in which variables may be simultaneously involved in both mediation and moderation associations (Hayes, 2018). Thus, these analyses are not a competing model but an examination of an independent process in which we expected that lower mental health would be less strongly associated with more problematic drinking among participants higher in harmonious religious passion and lower in obsessive passion. Generalized linear models were used to

evaluate lagged outcomes as a function of harmonious passion, obsessive passion, perceived stress, satisfaction with life, and the product terms of both passion variables with both mental health variables. For these analyses, predictors were mean centered. Robust standard errors were again used to adjust for correlations due to clustering within individuals. Results of these analyses are presented in Table 3. Results revealed that both obsessive and harmonious passion moderated the associations between perceived stress and drinking (Figure 2 and Figure 3) and the association between perceived stress and alcohol problems (Figure 4 and Figure 5).

Discussion

Consistent with expectations, greater harmonious passion for religious beliefs and practices was prospectively associated with less perceived stress and higher satisfaction with life over time (**H1**). This result supports previous literature on harmonious passion as well as research which has determined that religion is often linked to better mental health outcomes (Berthold & Ruch, 2014; Park, 2005). On the other hand, **H2** was only partially supported, in that obsessive passion for religious beliefs and practices was significantly, positively related to perceived stress over time, but was not significantly, negatively associated to satisfaction with life (although the beta coefficient was in the expected direction, see Table 2). This lack of significance between obsessive passion and satisfaction with life could be because, despite a rigid adherence to religion, the meaning in life the individual associates with religion may increase satisfaction with life for some people (Berthold & Ruch, 2014). As such, their inflexibility towards religion does not appear to impact their satisfaction with life. As expected, obsessive passion for religious beliefs and practices was found to be positively related to perceived stress. Thus, an obsessively passionate individual might be engaging in religious practices so often, he or she may feel trapped by these religious beliefs and practices, and may not feel that they integrate well with the rest of his or her identity; thus, the individual experiences increased stress.

Particularly interesting are the findings of the relationships between harmonious and obsessive passion and time-lagged drinking and alcohol problems (Figure 1). Higher levels of harmonious passion for religion were prospectively associated with lighter typical consumption levels. As previously mentioned, many religions often discourage drinking. Thus, it stands to reason that if religion plays an important, well-balanced part of an individual's life, a harmoniously passionate individual might be more likely to refrain from drinking. Furthermore, harmonious passion was unrelated to alcohol problems (**H3**). This finding makes intuitive sense as harmoniously individuals tend to drink less compared to obsessively passionate individuals. Conversely, higher levels of obsessive passion for religion were associated with marginal, prospective increases in drinking. This finding may be because obsessively passionate individuals might be drinking to cope with their failure to live up to their internal, rigid, religious expectations; however, this result may be marginal in that obsessively passionate individuals may drink more but are still able to temper their drinking in order to achieve their religious standards. As expected, obsessive passion was positively associated with alcohol problems. This may result from the fact that although obsessively passionate individuals typically do not drink much, they may be drinking more

to cope with the failure to meet their internal expectations, which leads them to experience increased consequences.

Because perceived stress was not predictive of alcohol consumption, contrary to previous research (Frone, 2015), the mediation of harmonious passion and consumption through perceived stress was not assessed. Furthermore, because satisfaction with life was not predictive of consumption or problems, none of the mediations through it were examined. Perceived stress was found to mediate the association between both obsessive and harmonious passions and alcohol problems, supporting our hypotheses (**H4**). The analyses with satisfaction with life were not run, given the fact that satisfaction with life was unrelated with drinking problems.

Furthermore, both passions for religious beliefs and practices were significant moderators of the association between perceived stress and drinking and perceived stress with alcohol problems. Our findings suggest that perceived stress was associated with more drinking and alcohol problems for those who were higher in obsessive passion. Perceived stress was associated with less drinking and alcohol problems for those higher in harmonious passion. This suggests that harmonious passion for religious practices and beliefs serves as a buffer against drinking as a result of perceived stress. Conversely, the reverse was true for those who were obsessively passionate individuals such that those with obsessive passion might drink more and experience more alcohol-related problems due to perceived stress, some of which might be caused by their rigid religious beliefs and practices. Overall, these findings suggest that religiousness can be a protective factor for problematic drinking, when engagement in religion is not itself problematic.

Limitations and Future Directions

This study's strengths should be viewed in light of its limitations. The sample used for this study included college students who had experienced a heavy drinking episode in the past month. While the results still hold interest, it should be important to note the limited generalizability of the findings. Passion for religious beliefs and practices may behave differently in samples of non-college students, or of average drinkers. Furthermore, this study was conducted at a university in the southwest, where religion can be a more important factor in the daily life of respondents (Pew Research Center, 2014). While this may have assisted in the recruitment of our religious sample, in order to expand generalizability, future studies should replicate this research with other populations to examine how the effects hold in places where it is less socially expected for one to endorse religious affiliation. Another limitation was that specific religious affiliation was not assessed for this study. While the measure of passion for religious beliefs and practices is easily applicable to members of all religions, these constructs may behave differently in different religious groups, as variance in drinking behavior by religious affiliations have been well documented. Other studies at this university have reported high levels of Christian respondents (71.6%; Tomkins, Neighbors, & Park, in press), followed by non-religious or agnostic respondents (13.2%), Muslim (4.79%), Buddhist (3.89%), Atheist (2.40%), Hindu (1.80%), Jewish (0.90%) and other (1.50%). It is difficult to be certain that religious affiliation did not play a role in the findings of this study, but it is likely that these findings

hold, at least in predominantly Christian groups. However, variance in drinking behavior by Christian denominations have been well documented, and should be examined in subsequent research (Michalak, Trocki, & Bond, 2007). The relative degrees of harmonious and obsessive passion might also vary as a function of denomination. In addition, religiousness was not measured in any way other than the passion measure. Other measures of religiousness may play a different role in drinking behaviors. For example, public versus private religiousness might be equally relevant in predicting alcohol-related outcomes (Nonnemaker et al., 2003). Future studies should examine religious passion in conjunction with other religious constructs.

Finally, future research focusing on application of the present findings and the larger body of findings related to religiousness and drinking has the potential to provide unique contributions. Brief interventions that examine religiousness are essentially non-existent, despite the clear relationship between religion and drinking. While religiousness and drinking are typically negatively correlated (Koenig et al., 2012), there are a significant number of individuals who are both religious and who at least occasionally engage in heavy drinking. More importantly, although religiousness has been shown to be generally protective for problematic drinking, the current research demonstrates that in certain contexts, religiousness might be somewhat harmful to individuals' mental health and contribute to greater substance use and associated problems. Further research should be conducted to provide deeper insights into the relationship between religiousness and health.

Research reported in this publication was supported by the National Institute on Alcohol Abuse And Alcoholism of the National Institutes of Health under Award Numbers: R01AA014576 and K99AA025394. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

References

1. Allport GW, (1963). Behavioral Science, Religion, and Mental Health. *Journal of Religion and Health*, 2(3), 187–197. Retrieved from <http://www.jstor.org.ezproxy.lib.uh.edu/stable/27504566>
2. Astin AW, Astin HS, & Lindholm JA (2010). *Cultivating the spirit: How college can enhance students' inner lives*. John Wiley & Sons.
3. Atkins DC, Baldwin SA, Zheng C, Gallop RJ, & Neighbors C (2013). A tutorial on count regression and zero-altered count models for longitudinal substance use data. *Psychology of Addictive Behaviors*, 27(1), 166. [PubMed: 22905895]
4. Baldwin AS, Baldwin SA, Loehr VG, Kangas JL, & Frierson GM (2013). Elucidating satisfaction with physical activity: An examination of the day-to-day associations between experiences with physical activity and satisfaction during physical activity initiation. *Psychology & Health*, 28(12), 1424–1441. [PubMed: 23909464]
5. Bélanger JJ, Lafrenière MAK, Vallerand RJ, & Kruglanski AW (2013). When passion makes the heart grow colder: The role of passion in alternative goal suppression. *Journal of Personality and Social Psychology*, 104(1), 126. [PubMed: 22905768]
6. Burke A, Van Olphen J, Eliason M, Howell R, & Gonzalez A (2014). Re-examining religiosity as a protective factor: Comparing alcohol use by self-identified religious, spiritual, and secular college students. *Journal of Religion and Health*, 53(2), 305–316. [PubMed: 22706922]
7. Camatta CD & Nagoshi CT (1995). Stress, depression, irrational beliefs, and alcohol use and problems in a college student sample. *Alcoholism: Clinical and Experimental Research*, 19(1), 142–146.

8. Clark LA, & Watson D (1988). Mood and the mundane: Relations between daily life events and self-reported mood. *Journal of Personality and Social Psychology*. 54, 296–308. [PubMed: 3346815]
9. Cohen S, Kamarck T, & Mermelstein R (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 385–396. [PubMed: 6668417]
10. Conway KP, Swendsen J, Mathilde MH, He J, & Merikangas KR (2016). Association of lifetime mental disorders and subsequent alcohol and illicit drug use: Results from the national comorbidity survey-Adolescent supplement. *Journal of the American Academy of Child and Adolescent Psychiatry*, 55(4), 280–288. [PubMed: 27015718]
11. Davis C, Katzman KD & Kirsh C 1999 Compulsive Physical Activity in Adolescents with Anorexia Nervosa. *The Journal of Nervous & Mental Disease*, 187(6) 336–342. [PubMed: 10379720]
12. Diener ED, Emmons RA, Larsen RJ, & Griffin S (1985). The satisfaction with life scale. *Journal of Personality Assessment*, 49(1), 71–75. [PubMed: 16367493]
13. Drabble L, Trocki KF, & Klinger JL (2016) Religiosity as a protective factor for hazardous drinking and drug use among sexual minority and heterosexual women: Findings from the National Alcohol Survey. *Drug and Alcohol Dependence*.
14. Fergusson D, McLeod G, Horwood L, Swain N, Chapple S, & Poulton R (2015). Life satisfaction and mental health problems (18 to 35 years). *Psychological Medicine*, 45(11), 2427–2436. doi: 10.1017/S0033291715000422. [PubMed: 25804325]
15. Frone MR (2015). Work stress and alcohol use: Developing and testing a biphasic selfmedication model. *Work & Stress*, 30(4), 374–394. doi: 10.1080/02678373.2016.1252971.
16. Galen LW & Rogers WM (2004). Religiosity, alcohol expectancies, drinking motives and their interaction in the prediction of drinking among college students. *Journal of Studies on Alcohol*, 65(4), 469–476. Doi: 10.15288/jsa.2004.65.469. [PubMed: 15376822]
17. Hayes AF (2013). Introduction to mediation, moderation, and conditional process analysis: a regression-based approach *Methodology in the social sciences*. New York, NY: The Guilford Press.
18. Hilbe JM (2011). *Negative binomial regression*. Cambridge University Press.
19. Kanner AD, Coyne JC, Schaefer C, & Lazarus RS (1981). Comparison of two modes of stress measurement: Daily hassles and uplifts versus major life events. *Journal of Behavioral Medicine*, 4, 1–39 [PubMed: 7288876]
20. Kirkpatrick LA, & Hood RW Jr (1990). Intrinsic-extrinsic religious orientation: The boon or bane of contemporary psychology of religion?. *Journal for the Scientific Study of Religion*, 44:2462.
21. Koenig H, King D, & Carson VB (2012). *Handbook of Religion and Health*. Oxford university press.
22. Mageau GA, Carpentier J, & Vallerand RJ (2011) The role of self-esteem contingencies in the distinction between obsessive and harmonious passion. *European Journal of Social Psychology*, 41, 720–729. doi: 10.1002/ejsp.798
23. Mageau GA, Vallerand RJ, Rousseau FL, Ratelle CF, & Provencher PJ (2005). Passion and gambling: Investigating the divergent affective and cognitive consequences of gambling. *Journal of Applied Social Psychology*, 35(1), 100–118.
24. Meyers JL, Brown Q, Grant BF, & Hasin D (2017). Religiosity, race/ethnicity, and alcohol use behaviors in the United States. *Psychological Medicine*, 47(1), 103–114. [PubMed: 27667499]
25. Michalak L, Trocki K, & Bond J (2007). Religion and alcohol in the US National Alcohol Survey: how important is religion for abstention and drinking?. *Drug and alcohol dependence*, 87(2), 268–280. [PubMed: 16987610]
26. Miller SM, & Green ML (1985). Coping with Stress and Frustration In Lewis M & Saarni C (Eds.), *The Socialization of Emotions* (pp. 263–314). Boston, MA: Springer US.
27. Nonnemaker JM, McNeely CA, & Blum RW (2003). Public and private domains of religiosity and adolescent health risk behaviors: Evidence from the National Longitudinal Study of Adolescent Health. *Social Science & Medicine*, 57(11), 2049–2054. [PubMed: 14512236]

28. Parenteau SC, Waters K, Cox B, Patterson T, & Carr R (2017). Racial discrimination and alcohol use: The moderating role of religious orientation. *Substance Use & Misuse*, 52(1), 1–9. [PubMed: 27618694]
29. Patock-Peckham JA, Hutchinson GT, Cheong J, & Nagoshi CT (1998) Effect of religion and religiosity on alcohol use in a college student sample. *Drug and Alcohol Dependence*, 49 (2), 81–88. Doi: 10.1016/S0376-8716(97)00142-7. [PubMed: 9543644]
30. Pew Research Center (2014) U.S. Religious Landscape Study. Retrieved from <http://www.pewforum.org/religious-landscape-study/>.
31. Philippe FL, Vallerand RJ, & Lavigne GL (2009). Passion does make a difference in people's lives: A look at well-being in passionate and non-passionate individuals. *Applied Psychology: Health and Well-Being*, 1(1), 3–22.
32. Przybylski MA, Weinstein N, Ryan RM, & Rigby CS (2009) Having to versus wanting to play: Background and consequences of harmonious versus obsessive engagement in video games. *CyberPsychology and Behavior*, 12(5), 485–492. [PubMed: 19772442]
33. Rew L, & Wong YJ (2006). A systematic review of associations among religiosity/spirituality and adolescent health attitudes and behaviors. *Journal of Adolescent Health*, 38(4), 433–442. [PubMed: 16549305]
34. Singh P, & Bano S (2017). Effect of Intrinsic-Extrinsic Religiosity on the Psychological Wellbeing of Adolescents. *Journal of Psychosocial Research*, 12(1), 137.
35. Sobell LC, & Sobell MB (1996). *Timeline followback user's guide: A calendar method for assessing alcohol and drug use*. Toronto: Addiction Research Foundation.
36. StataCorp. 2017 Stata Statistical Software: Release 15. College Station, TX: StataCorp LLC.
37. Steers M-LN, Neighbors C, Christina Hove M, Olson N, & Lee CM (2015). How harmonious and obsessive passion for alcohol and marijuana relate to consumption and negative consequences. *Journal of Studies on Alcohol and Drugs*, 76(5), 749–757. [PubMed: 26402355]
38. Stenseng F, Rise J, & Kraft P (2011). The dark side of leisure: Obsessive passion and its covariates and outcomes. *Leisure Studies*, 30(1), 49–62.
39. Stenseng F, Haugen T, Torstveit MK, & Høigaard R (2015). When it's 'All about the bike'—Intrapersonal conflict in light of passion for cycling and exercise dependence. *Sport, Exercise, And Performance Psychology*, 4(2), 127–139. doi:10.1037/spy0000028
40. Strine TW, Chapman DP, Balluz LS, Moriarty DG, & Mokdad AH (2008). The associations between life satisfaction and health-related quality of life, chronic illness, and health behaviors among U.S. community-dwelling adults. *Journal of Community Health*, 33(1).
41. Tomkins MM, Neighbors C, & Park CL (in press) Religious discrepancy as a mediator of a religious intervention for problematic drinking. *Psychology of Religion and Spirituality*.
42. Rousseau FL, Vallerand RJ, Ratelle CF, Mageau GA, Provencher PJ (2002) Passion and gambling: On the validation of the gambling passion scale (GPS). *Journal of Gambling Studies*, 18(1), 45–66. [PubMed: 12050847]
43. Tofighi D & MacKinnon DP 2011 RMediation: An R package for mediation analysis confidence intervals. *Behavior Research Methods*, 43, 692–700. [PubMed: 21487904]
44. Vallerand RJ, Blanchard C, Mageau GA, Koestner R, Ratelle C, Léonard M, & Marsolais J (2003). Les passions de l'âme: On obsessive and harmonious passion. *Journal Of Personality And Social Psychology*, 85(4), 756–767. [PubMed: 14561128]
45. Vallerand RJ, & Houliort N (2003). Passion at work: Toward a new conceptualization In Gilliland SW, Steiner DD, & Skarlicki DP (Eds.), *Emerging perspectives on values in organizations* (pp. 175–204). Greenwich, CT: Information Age Publishing.
46. Wills TA (1986). Stress and coping in early adolescence: Relationships to substance use in urban school samples. *Health Psychology*, 5, 503– 529. [PubMed: 3492372]
47. Wang CC, & Yang HW (2008). Passion for online shopping: The influence of personality and compulsive buying. *Social Behavior and Personality: An International Journal*, 36(5), 693–706.
48. White HR, & Labouvie EW (1989). Towards the assessment of adolescent problem drinking. *Journal of Studies on Alcohol*, 50(1), 30–37. [PubMed: 2927120]
49. Wills TA (1986). Stress and coping in early adolescence: Relationships to substance use in urban school samples. *Health Psychology*, 5, 503–529. [PubMed: 3492372]

50. Zhang S, Shi R, Liu X, & Miao D (2014). Passion for a leisure activity, presence of meaning, and search for meaning: The mediating role of emotion. *Social Indicators Research*, 115(3), 1123–1135.
51. Zullig KJ, Valois RF, Huebner ES, Oeltmann JE, & Drane JW (2001). Relationship between perceived life satisfaction and adolescents' substance abuse. *Journal of Adolescent Health*, 29(4), 279–288. doi: 10.1016/S1054-139X(01)00269-5. [PubMed: 11587912]

Highlights:

- Harmonious and obsessive religious passion are differentially related to drinking.
- Obsessive passion at time 1 positively predicted perceived stress at time 2.
- Perceived stress mediates the relationship between obsessive passion and drinking.

Figure 1.
Time-lagged Drinking and time-lagged alcohol-related problems as a function of passion.

Figure 2.
Harmonious passion moderates the association between perceived stress and drinking.

Figure 3. Obsessive passion moderates the association between perceived stress and alcohol problems.

Figure 4. Harmonious passion moderates the association between perceived stress and alcohol problems.

Figure 5. Obsessive passion moderates the association between perceived stress and alcohol problems.

Table 1.

Time-lagged drinking outcomes as a function of passion for religious beliefs and practices and mental health.

Outcome		Predictor	B	RSE B	Z	expB
Consumption	Step 1	Time	−0.028	0.049	−0.57	0.972
		Obsessive Passion	0.066	0.036	1.85†	1.068
		Harmonious Passion	−0.139	0.039	−3.58***	0.870
	Step 2	Time	−0.034	0.050	−0.67	0.967
		Obsessive Passion	0.063	0.035	1.79	1.065
		Harmonious Passion	−0.141	0.038	−3.71***	0.868
		Perceived Stress	0.061	0.080	0.76	1.063
		Satisfaction with Life	0.011	0.007	1.51	1.011
Problems	Step 1	Time	0.011	0.072	0.15	1.011
		Obsessive Passion	0.116	0.044	2.62**	1.123
		Harmonious Passion	−0.074	0.055	−1.34	0.929
	Step 2	Time	0.021	0.079	0.26	1.021
		Obsessive Passion	0.088	0.044	2.00*	1.092
		Harmonious Passion	−0.036	0.054	−0.66	0.965
		Perceived Stress	0.330	0.107	3.07**	1.391
		Satisfaction with Life	0.005	0.010	0.50	1.005

Table 2.

Mental health as a function of passion for religious beliefs and practices.

Outcome	Predictor	B	RSE B	Z
Perceived Stress	Time	−0.024	0.015	−1.59
	Obsessive Passion	0.045	0.017	2.66**
	Harmonious Passion	−0.054	0.017	−3.11**
Satisfaction with Life	Time	−0.037	0.149	−0.25
	Obsessive Passion	−0.097	0.179	−0.54
	Harmonious Passion	0.788	0.195	4.05***

Table 3.

Passion for religious beliefs and practices as a moderator of the association between perceived stress and drinking outcomes.

	b	SE b	Z	P	e^b	e^b 95% CI
Alcohol Consumption						
Intercept	2.910	0.049	59.01	<0.001	18.35	16.66–20.21
Time	−0.046	0.049	−0.94	0.056	0.96	0.87–1.05
Obsessive Passion (OP)	0.068	0.035	1.91	0.056	1.07	1.00–1.15
Harmonious Passion (HP)	−0.148	0.039	−3.84	<0.001	0.86	0.80–0.93
Perceived Stress (PS)	0.085	0.078	1.09	0.275	1.09	0.94–1.27
Satisfaction with Life (SWLS)	0.012	0.007	1.67	0.095	1.01	1.00–1.03
OP X PS	0.123	0.059	2.10	0.036	1.13	1.01–1.27
OP X SWLS	0.005	0.006	0.84	0.403	1.01	0.99–1.02
HP X PS	−0.142	0.068	−2.10	0.036	0.87	0.76–0.99
HP X SWLS	−0.008	0.006	−1.35	0.178	0.99	0.98–1.00
Alcohol Problems						
Intercept	1.469	0.057	26.01	<0.001	4.35	3.89–4.86
Time	0.009	0.072	0.12	0.056	1.01	0.88–1.16
Obsessive Passion (OP)	0.093	0.044	2.12	0.056	1.10	1.01–1.20
Harmonious Passion (HP)	−0.054	0.051	−1.06	<0.001	0.95	0.86–1.05
Perceived Stress (PS)	0.362	0.093	3.91	0.275	1.44	1.20–1.72
Satisfaction with Life (SWLS)	0.008	0.009	0.88	0.095	1.01	0.99–1.03
OP X PS	0.153	0.068	2.25	0.036	1.17	1.02–1.33
OP X SWLS	0.005	0.007	0.67	0.403	1.01	0.99–1.02
HP X PS	−0.195	0.096	−2.04	0.036	0.82	0.68–0.99
HP X SWLS	0.000	0.008	−0.04	0.178	1.00	0.98–1.02

Note. Bold lines represent significant differences.