

Article

Religious Activities and Suicide Prevention: A Gender Specific Analysis

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Abstract: The present analysis contributes to the existing literature on religion and suicide in three interrelated ways: (1) providing an analysis of suicide completions whereas most research is based on non-lethal levels of suicidality; (2) assessing the relationship with concrete individual level data on completed suicides instead of aggregated data marked by the ecological fallacy issue; and (3) providing gender specific analyses to determine if the relationship is gendered. **METHODS.** Data come from the U.S. Public Health Service, National Mortality Followback Survey. They refer to 16,795 deaths including 1385 suicides. Significant others of the deceased were interviewed to measure all variables. The dependent variable is a binary variable where 1 = death by suicide and 0 = all other causes. The central independent variable is an index of religious activities. Controls are included for five categories of confounders (1) psychiatric morbidity; (2) help-seeking behavior; (3) Opportunity factors such as firearms; (4) social integration; and (5) demographics. **RESULTS.** Multivariate logistic regression analysis determined that controlling for 16 predictors of suicide, a one unit increase in religious activities reduced the odds of a suicide death by 17% for males and by 15% for females. The difference in coefficients is not significant ($Z = 0.51$). Other significant predictors of suicide deaths included suicide ideation (OR = 8.87, males, OR = 11.48, females) and firearm availability (OR = 4.21, males, OR = 2.83, females). **DISCUSSION.** Religious activities were found to lower suicide risk equally for both men and women. Further work is needed to assess pathways, including suicide ideation, between religious activities and lowered suicide risk. This is the first U.S. based study to test for a gendered association between religion and suicide at the individual level of analysis.

Keywords: suicide; religiousness; gender

1. Introduction

According to the Centers for Disease Control, an estimated 8.3 million American adults seriously consider suicide, 2.2 million adults report making suicide plans and more than one million adults report attempting suicide in the past year (Crosby et al. 2011). However, fewer than 45,000 die through suicide each year, with 42,773 suicides in 2014 (Heron 2016). Some factors are holding most suicidal persons back from actually ending their lives. One such factor can be religion.

Since the classic work of 19th century sociologist (Durkheim [1987] 1966), religion has often been found to be a protective factor against suicide (for reviews see Lester 2000; Stack 2000; Colucci and Martin 2008; Stack and Kposowa 2016). However, religion does not always serve as a protective factor in ecological studies and there is some evidence that its protective feature varies by region of the world. In a cross-national study of 42 nations over 1981–2007, Hsieh (2017) reports that aggregate mean levels of religious participation are more apt to be associated with lower national suicide rates in English speaking nations, Latin America, Eastern Europe and Northern Europe. Religion may actually aggravate suicide risk in East Asia, Western Europe and Southern Europe

(Hsieh 2017). Work at the concrete individual level is much less common and is unavailable in many nations. This leaves the nature of the religion—suicide deaths relationship somewhat ambiguous on a global level.

Research on religion and suicide is marked by a series of limitations. These include the use of aggregated data, a focus on non-lethal levels of suicidality such as ideation and attempts, and the relative lack of gender specific analyses. The present study addresses these three issues by analyzing U.S. national data on completed suicides, using individual level data on suicide and religion and testing for a gendered relationship between religion and suicide.

First, most of the work on religion and suicide falls short of assessing religion's impact on actual deaths by suicide (Kleiman and Liu 2018; Koenig et al. 2001, 2012; Lester 2000; Stack 2000; Stack and Kposowa 2016). The majority of studies deal with other levels of suicidality, notably suicide ideation and suicide attempts (Koenig et al. 2001, 2012). For example, Kleiman and Liu (2018) report that only three studies were found that explored the association between religious activities and actual deaths by suicide at the concrete individual level. Most of the research assesses the links between a measure of religion and one of the following measures of suicidality: suicide ideation, suicide attempts, suicide plans, or suicide acceptability (Koenig et al. 2001, 2012; Stack 2000; Stack and Kposowa 2016). An over focus on non-lethal suicidality can be misleading. Some patterns of suicidality vary according to the level of suicidality. For example, females have a higher rate of suicide attempts than males but the reverse is true if we turn to actual suicide completions (Lester 2000; Stack 2000).

Second, most of the work that does deal with death rates by suicide is based on ecological data (e.g., Chon 2017; Colucci and Martin 2008; Hsieh 2017; Phillips 2013; Kleiman and Liu 2018; Stack and Laubepin 2018; for reviews see Colucci and Martin 2008; Lester 2000; Stack 2000; citealpB32-religions-277188). Religious measures are used to predict the rates of suicide for such aggregates as cities, countries, states and nations (Lester 2000; Stack 2000). This work is marked by the ecological fallacy problem. It is unclear to what extent the persons who die by suicide are disproportionately the ones who are presumably low in measures of religion. Work on the concrete level of individuals is needed to address this issue.

A third, recurrent limitation of the literature is that there is little gender specific analysis. Generally, even individual level analyses of religion and suicide mortality are not gender specific but lump males and females together (e.g., Foster et al. 1999; Hilton et al. 2002; Kleiman and Liu 2014, 2018; Nisbet et al. 2000; Phillips and Luth 2018; Stack and Scourfield 2015). To the extent that females are higher in measures of religion than males, it may be that the association between religion and suicide is gendered. Stack (2000) concludes in his review of the literature on suicide completions, work which is based, however, at the ecological level, that the weight of the evidence points to religion having more of a protective effect on females than males. More recently, in an analysis of the fifty states spanning 1976–2000 Phillips (2013) reports that the religious adherence rate predicted lower suicide rates for females. It was, however unrelated to male suicide rates. This calls for gender specific analyses. None are available for U.S. based individual level data.

The present paper adds to the literature in several inter-related ways. First, it employs data on suicide completions, a relatively neglected level of suicidality. Second, the paper avoids the ecological fallacy issue by employing individual level data on both religion and suicide. Third, the present investigation assesses the relationship between religion and suicide separately for males and females in order to see if the association is gendered. Finally, unlike many studies done at the concrete individual level of analysis, which have two or fewer control variables (Maris 1981; Feigelman et al. 2014; Foster et al. 1999; Hilton et al. 2002), the present paper controls for a series of covariates of religion. The analysis adjusts the religion—suicide association for measures of psychiatric morbidity, help seeking, opportunity factors, social integration and demographic constructs. In this manner, we can check to see if religion still affects suicide risk independent of a wide array of controls. This is the first U.S. based study performing gender specific analysis of individual level data on religion and deaths by suicide.

2. Methodology

All data are from the National Mortality Follow Back Survey (U.S. Public Health Service 2000). These data are based on a national representative sample of deaths. Data on the characteristics of the deceased were obtained through interviews by trained professionals. The National Mortality Follow Back Survey (NMFBS) is the largest publicly available individual level database, which contains a spectrum of psychiatric, social, demographic and other characteristics of the deceased, on suicide in the United States. For a further description of the NMFBS see U.S. Public Health Service (2000).

The dependent variable is a binary measure where 1 = a death by suicide and 0 = all other deaths. Since the dependent variable is a dichotomous one, logistic regression techniques are appropriate (Menard 2002).

The central independent variable, religion, is measured by the one available index in the NMFBS. This index concerns the extent of involvement in religious activities. The specific measure is the question asked of the significant others of the deceased: "How often did the deceased participate in religious activities?" The standard responses offered ranged from never (0) through every day (5).

Suicide ideation is measured by the NMFBS item: At any time during the last month of life did the deceased talk about taking his/her own life? Where 0 = no and 1 = yes.

Psychiatric morbidity is measured by depression and alcohol abuse. Depression is based on eight available items measuring the presence of feelings of worthlessness, withdrawal, problems concentrating, wish to die, changes in sleep patterns, changes in weight, crying spells and sluggishness, where 1 = symptom was often present and 0 = all others. Responses to the eight questions were summed to create an index. The range in depression was 0 to 8. The alpha reliability coefficient was 0.7414. Alcohol abuse is measured using the NMFBS item on the frequency of binge drinking (0–5).

Four controls are employed for professional help seeking behaviors. These variables include a report that the deceased: (a) saw a psychologist (at any time) during the last year of life (0,1); (b) was taking anti-depressants at any time (0,1); (c) saw a psychologist and was taking anti-depressants (0,1); and (d) was believed to need psychological help but did not seek it (0,1).

Opportunities for suicide increase the risk of self-destruction (Lester 2000; Stack 2000). Two binary variables are entered into the analysis: means restriction and living in a controlled, institutionalized environment. Firearm availability is measured by the reported presence of a firearm in the home of the deceased (0,1). From the standpoint of lethal locations theory, persons living in supervised environments with motivated guardians would have less opportunity to suicide (Wasserman and Stack 2008). Controlled supervision is measured as residence in an institution (e.g., nursing home) and captured by a dichotomous variable (0,1).

Four measures of social integration are incorporated and are taken from the social integration literature (Lester 2000; Stack 2000). (a) Lives alone is a dichotomous variable (0,1). Besides a measure of low integration, it may also capture opportunities for suicide from a guardianship/opportunity theory of suicide (Wasserman and Stack 2008). The potential for someone being present to prevent a suicide attempt is arguably lower for those who live alone without a spouse, child, or other person as a watchful partner; (b) Migration is measured as having changed residences (moved) during the last year of life. Migration is thought to lower integration as one adjusts to new neighbors and surroundings and loses old ones (Stack 2000); (c) A third measure is the report by the significant other that the deceased had no close friends (0,1); (d) Finally, following Stack (2009), a measure is included for economic integration. A distinction is made between persons who were demoted on their job during the last year of life and those who were not (0,1).

Measures for demographics were also incorporated: age measured in years, region of the nation which was measured as a series of binary variables as Midwest (0,1), South (0,1), West (0,1) and where the reference category is the Northeast. Marital status is coded as a series of binary variables: divorced (0,1), single (0,1) widow (0,1) and where married is the reference category.

Complete data were available on 16,795 deaths. These were comprised of 1385 suicides and 15,410 deaths from other causes.

3. Results

A focus of the present study is on religious activities and a test to determine if religious activities follows a gendered pattern in the prediction of suicide deaths (Stack 2000). As anticipated, in a preliminary analysis it was found that women scored higher than men on the religious activities index. The respective means for women and men were 1.73 for women and 1.32 for men and the difference was statistically significant ($p < 0.05$). Nevertheless, in a multivariate analysis the independent impact of religion on suicide deaths may not be gendered.

Table 1 presents the results of the multiple regression analysis. Panel A provides the findings for males. For males, controlling for the other constructs in the prediction equation, the greater the reported religious activities, the lower the risk of death by suicide. The logistic regression coefficient is over six times its standard error (0.029). From the odds ratio of 0.83, a one unit change in religious activities is associated with a (1–0.83) 17% lower risk of death by suicide.

Table 1. Religious Activities as a Predictor of Death by Suicide Controlling for Suicide Ideation, Psychiatric Morbidity and Socio-demographic Constructs. 1385 suicides and 15,410 other deaths. National Mortality Follow Back Survey. Multivariate Logistic Regression Results. Panel A. Males. Panel B. Females.

Variable	Panel A. Males		Panel B. Females	
	Coefficient	Odds Ratio	Coefficient	Odds Ratio
<u>Core Constructs</u>				
Religious Activities	−0.185 *	0.83	−0.158 *	0.85
Suicide Ideation	2.18 *	8.87	2.44 *	11.48
<u>Psychiatric Morbidity</u>				
Depression	−0.08 *	0.91	−0.08 *	0.91
Alcohol Abuse	0.02	1.01	0.07	1.08
<u>Professional Help Seeking</u>				
Saw Psychologist	0.70 *	2.01	1.49 *	4.46
On Anti-Depressants	0.32	1.37	1.57 *	4.84
Needed Medical Help but did not receive it	0.09	1.09	0.13	1.14
Saw Psychologist and on Anti-depressants	0.17	1.18	−0.87 *	0.41
<u>Opportunity Factors</u>				
Firearm Available	1.43 *	4.21	1.04 *	2.83
Resides in an Institution	−0.51 *	0.59	−0.65	0.51
<u>Social Integration</u>				
Lives Alone	0.43 *	1.54	1.02 *	2.78
Moved Residences	1.22 *	3.41	1.21 *	3.37
No Friends	0.01	1.01	−0.58 *	0.55
Job Demotion	1.29 *	3.66	1.34	3.84
Nagelkerke r-squared	0.295		0.392	
Model Chi Square	1533.911 *		1013.730 *	
Cases correctly classified	91.62%		94.6	

* $p < 0.05$. Coefficients for demographic variables not shown for the purposes of brevity and clarity.

Panel B provides the results for females. Controlling for the other predictor variables, the greater the reported religious activities the lower the risk that females will die by suicide. From the odds ratio for each unit increase in religious activities, the odds of death by suicide diminish by 15% (1–0.85).

A key issue is whether or not religion decreases the odds of suicide for males (17% reduction per unit increase in religious activities) significantly more than females (15% reduction per unit). To address this issue a z test for the difference between the respective regression coefficients was employed (Cohen 1983). The z statistic was not significant ($Z = 0.51$, $p > 0.05$), the Z was not less than −1.96 or greater than 1.96, the ranges required for significant differences using a two-tailed test.

For males, controlling for the other predictor variables, suicide ideation is a strong predictor of death by suicide. Males who reportedly conveyed a message that they were thinking about killing

themselves in the year of their death were fully 8.8 times more apt to die through suicide than males who gave no such public reports. Turning to column B for females, suicide ideation is also a strong predictor of death by suicide. From the odds ratio, controlling for the other predictors, females who were suicide ideators were 11.48 times more apt to die through suicide than other females. Suicide ideation was the strongest predictor of suicide for men (OR = 8.8) and also for women (OR = 11.4) but the difference in coefficients was not significant ($Z = -0.12, p > 0.05$).

Turning to the psychiatric morbidity indicators, the presence of depression lowers the risk of suicide by 9% (1.0–0.91). This is the reverse of the anticipated relationship where depression is thought to increase suicide risk. However, in an analysis not fully reported here, which omitted the suicide ideation variable, depression did increase the odds of suicide death. Apparently, depression's association with suicide is not independent of suicide ideation. Suicide ideation itself is often included in measures of depression such as the Beck depression inventory (Beck et al. 1961). Alcohol abuse is also unrelated to suicide deaths independent of the other predictor constructs. Turning to column B providing the results for females, the patterns are similar. Depression reduces suicide risk (OR = 0.91) and alcohol abuse is unrelated to suicide deaths.

For males, only one of the four professional help-seeking measures is predictive of suicide deaths. Having seen a psychologist in the last year of life increases the risk of suicide. Controlling for the other predictors, from the odds ratio, males seeking such help are 2.01 times more apt to die through suicide than males not seeking such help. Turning to column B for females, women who saw a psychologist in the last year of life were 4.46 times more apt to die of suicide than their counterparts. Women who were on anti-depressants were also more apt to die of suicide than other women (OR = 4.84). However, there was an interaction effect. Women who received both psychological help and who were on anti-depressants were 59% less apt to die of suicide than other women. This last finding suggests that a combination of talk and pharmacological treatments helps to decrease suicide risk for women.

Both opportunity factors are predictive of suicide deaths. Males residing in homes where firearms are available are fully 4.21 times more apt to suicide than their male counterparts. In addition, males who reside in institutional settings are 41% (1–0.59) less apt to die through suicide than their counterparts. Turning to column B, females who resided in a home where a firearm was available were 2.83 times more apt than women lacking access to a firearm in their homes to die through suicide. However, residence in an institution did not provide protection against suicide for women.

The measures of social integration showed some patterns similar for men and women. For both men and women, living alone increased the risk of suicide. The respective odds ratios were 1.54 and 2.78. In like manner, changing residences in the last year of life increased suicide risk for both genders. The respective odds ratios were 3.41 and 3.37. The lack of friends was unrelated to male suicide but reduced the risk for women by 45% (OR = 0.55).

On the whole, the models provide a good fit to the data as noted by the respective model chi square statistics. In addition, the models correctly predict manner of death for 91.6% of males and 94.6% of females. From the nagelkerke r-square statistics, 29.5% of the variance is explained by the model for males and 39.2% of the variance in female suicide is explained by the model for females.

For both males and females suicide ideation was the leading predictor of death by suicide. As such, it is important to ascertain if religion predicts suicide ideation. In analyses not fully reported here, the models from Table 1 were re-generated using suicide ideation as the dependent variable and all other predictor variables in Table 1 were employed. The results of a multivariate logistic regression analysis determined that a one unit increase in religious activities decreased suicide ideation by 19% for men and by 18% for women (not gendered). Some of the influence of religion on death by suicide is mediated by suicide ideation. Religion decreases suicide ideation which, in turn, has a powerful association with death by suicide.

4. Discussion

Previous individual level work has generally not assessed whether or not the link between religion and suicide completions is gendered (Feigelman et al. 2014; Foster et al. 1999; Hilton et al. 2002; Kleiman and Liu 2014, 2018; Nisbet et al. 2000; Phillips and Luth 2018; Spoerri et al. 2010; Stack 2009; Stack and Scourfield 2015; VanderWeele et al. 2016). To the extent that women are more religious than men, religion may protect women more than men against suicide (Phillips 2013; Stack 1983, 2000). The present study assesses the religion—suicide association for men and women separately.

The results of a multivariate logistic regression analysis find that the religion—suicide relationship is not gendered. A z-test for significance between the logistic regression coefficients from the male and the female separate analysis found no significant difference. Religious activities protect both men and women from suicide deaths. The extent to which religion protects against suicide is essentially the same for males and females. This is the first U.S. study to assess if religion protects women more than men at the individual level.

Findings on the control constructs were mixed. Several significant predictors are new or relatively understudied in the existing literature at the individual level of analysis. Two results, in particular are relatively new: these concern an opportunity and a social integration measure. Residence in a rest home protected against suicide. The higher degree of guardianship in such places is assumed to deter suicide (Wasserman and Stack 2008). Moving to a new residence, residential mobility, enhanced the risk of suicide for both men and women. A sociological perspective on migration generally argues that such change disrupts social networks which protected against suicide (Stack 1982, 2000). These findings are in need of replication.

The basic finding that religion protects against suicide is consistent with all five previous U.S. based studies following a cross-sectional design (e.g., Hilton et al. 2002; Maris 1981; Nisbet et al. 2000; Stack 2009; Stack and Scourfield 2015). The present study's finding that religion protects against suicide is also consistent with most of the prospective or individual longitudinal investigations which also found a protective effect (Feigelman et al. 2014; Kleiman and Liu 2014; Spoerri et al. 2010; VanderWeele et al. 2016). These previous studies did not, however, perform gender specific analyses. One is restricted to a single occupational group of nurses (VanderWeele et al. 2016), and, as such, the findings might not be generalizable to a general population of persons from all occupational backgrounds. The present study is based on a broad representative sample of persons with diverse occupational backgrounds. Hence, it helps to establish a religion—suicide association on a firmer basis.

The main finding that religion protects against suicide is not consistent with four of the previous 13 studies done at the individual level of analysis on deaths from suicide. One is based in China, a largely atheistic nation (Zhang et al. 2011). As an Asian nation with a rather small religious population, it would not be expected that religion would deter suicide in China (Hsieh 2017). Two prospective studies did not find an association between religion at baseline and suicide at follow-ups. Both used the same datasets, the merged files of the General Social Surveys and the National Death Index. However, these two studies had the longest window of time between the first and only baseline measurement of religion and the end of the follow-up period, 37 years in both cases (Kleiman and Liu 2018; Phillips and Luth 2018). The use of a long follow-up period may offer an explanation of the discrepancy in results between these two studies and the other prospective studies which used a shorter follow-up period.

Several limitations of the present study include the measure of religion and method of data collection. A limitation of the present study is that it had to rely on the only measure of religion in the NMFBS: religious activities. Future work is needed, once the necessary data become available, to explore the association between other measures of religion and suicide completions. Another limitation of the NMFBS is that it relies on a significant other of the deceased to estimate his/her religious participation. Future work could address this limitation, as the necessary data become available, where the religious activities of persons who ultimately die through suicide is measured directly before they pass away.

An advantage of the present research design is that it measures religion of the subject at the time of death. This is not true of half of the existing studies done at the individual level of analysis. Six of the previous 13 research studies at the individual level are marked by a large number of years (up to 37 years) between the measurement of religion at baseline and death by suicide (Feigelman et al. 2014; Kleiman and Liu 2014, 2018; Phillips and Luth 2018; Spoerri et al. 2010; VanderWeele et al. 2016). To the extent that the religion of persons changes over time, there is apt to be measurement error in this longitudinal research. In particular, attendance at religious services, a common measure in the relevant research, declined in the US from 45% in the 1980's to less than 30% in 2010, so this matter is of no small concern (Kleiman and Liu 2014; Kleiman and Liu 2018; Phillips and Luth 2018). Persons who are religious at baseline may not be so at death up to 37 years later and vice versa. Ideally, religion needs to be measured at the same time or year as death. The present study matches religion to the same year as death of the subject.

Additional work is needed to understand what are the principal mechanisms by which religion lowers the risk of suicide deaths. (Koenig et al. 2001, 2012) provide a pair of massive reviews of the literature on religion's associations with both physical and mental health. These volumes contain leads for future work on possible mediators of the religion—suicide linkage. For example, 73% of 40 studies found that religion reduces hopelessness. Hopelessness is a primary risk factor for suicide (Beck et al. 1989). Depression, another well researched risk factor concerning psychiatric morbidity (Lester 2000), was predictive of measures of suicidality in 64% of 96 studies done before the year 2000 and 63% of 272 studies done after 2000. Some religions prohibit or discourage smoking behavior, a risk factor for suicidality. Fully 96% of 24 studies determined that a measure of smoking was related to low scores on a measure of religion. Substance abuse was relatively low among persons higher in religion in 86% of 458 studies. Unfortunately, most research that keys in on suicide completions and religion, does not have measures for a full set of such factors. Many have no data on such possible mediators of the association between religion and suicide. For example, none of the 13 studies measured hopelessness and none measured the degree of interaction with co-religionists, a sociological factor known to lower the odds of suicidality (Stack and Kposowa 2016). Research on these and other health mediators is needed as the necessary data become available.

The present study found that suicide ideation was a significant predictor of suicide deaths. In addition, it noted that religion was a significant predictor of suicide ideation independent of 15 confounding variables. The higher the level of religion, the lower the odds that the subjects were reported to have conveyed the idea that they were seriously considering suicide in the year of death. This is a sign that religious people are less approving or accepting of the idea of suicide.

There is a substantial literature on suicide acceptability which generally finds strong associations between religion and low approval of suicide. This is true for large representative samples such as 51,000 persons in the World Values Surveys (Stack and Kposowa 2016). Further, two prospective findings reviewed (Feigelman et al. 2014; Phillips and Luth 2018) both found evidence that the higher the approval of suicide at baseline the greater the odds of eventual death by suicide at follow-up. However, those two previous prospective studies did not explore the extent to which religion predicted suicide acceptability. This linkage can be a starting point for future work.

The present study needs replication using other dimensions of the complex construct of religion. Religious activities, the measure employed in the present study taps several possible dimensions of religiosity including private activities such as prayer and public activities such as attendance at religious services and social events with co-religionists. As Koenig et al. (2001) point out, there are at least 13 dimensions of religiosity that have been used in the more general research on religion's contribution to physical and mental health. These include religious coping, knowledge, conversion, orthodoxy, affiliation and satisfaction. Work using data in the world values surveys has found that all four dimensions of religion, for which data were available (affiliation, coping, orthodoxy, activities with co-religionists) were independently related to suicide acceptability (Stack and Kposowa 2016).

Nevertheless, measures of certain dimensions of religion may not predict or only weakly predict deaths by suicide. Research is needed on this issue as data become available.

Finally, there is some evidence that scholarly work on suicide completions and religion remains neglected. This is from a content analysis by the present author, not fully reported here, of the 58 articles in the 2017 volume of *Suicide and Life Threatening Behavior*. Only five of the 58 articles deal with suicide deaths and none of these include religion as a predictor of suicide. In contrast, 22 include an analysis of suicide ideation, 18 analyze suicide attempts and 5 non-suicidal self-injury. None of the 58 articles focused on religion as a possible protective factor against suicide and essentially none included religion in their models. The results of 13 studies based on individual level measures of religion and suicide deaths suggest that religion needs to be included in future work, especially that done in the U.S., in order for models to be fully specified.

5. Conclusions

The present investigation Addresses three central, inter-related limitations of previous work on religion and suicide (1) over-reliance on non fatal level of suicidality (2) over-reliance on ecological data; and (3) Under exploration for a possible gendered effect.

Compared to over a hundred studies on other levels of suicidality such as suicide ideation, attempts, plans, and acceptability (Koenig et al. 2001, 2012; Lester 2000; Stack 2000; Stack and Kposowa 2016), there are relatively few investigations assessing the linkage between religiousness and suicide deaths (e.g., Foster et al. 1999; Hilton et al. 2002; Maris 1981; Nisbet et al. 2000; Stack 2009; Stack and Scourfield 2015; Zhang et al. 2011). Given that some basic patterns, such demographic ones regarding gender and race, are different for attempts vs. completions, it is wise to study suicide completions in their own right (Feigelman et al. 2014; Lester 2000; Stack 2000). The present study meets this call by its focus on actual suicide deaths.

Second, most of the research using a social or sociological perspective on religion as a predictor of suicide deaths has focused on aggregate data (e.g., Balint et al. 2014; Burr et al. 1999; Chon 2017; Faria et al. 2014; Hsieh 2017; Phillips 2013; Stack and Laubepin 2018; for reviews see Colucci and Martin 2008; Lester 2000; Stack 1982, 2000; Stack and Kposowa 2016). As such, it is unclear to what extent the persons suiciding are persons relatively low in religiousness. The present investigation analyzes individual level data to address this issue.

Third, previous individual level work has generally not assessed whether or not the link between religion and suicide completions is gendered (Feigelman et al. 2014; Foster et al. 1999; Hilton et al. 2002; Kleiman and Liu 2014, 2018; Nisbet et al. 2000; Phillips and Luth 2018; Spoerri et al. 2010; Stack 2009; Stack and Scourfield 2015; VanderWeele et al. 2016). To the extent that women are more religious than men, religiousness may protect women more than men against suicide (Stack 1983, 2000). The present study assesses the religiousness—suicide association for men and women separately.

The results of a multivariate logistic regression analysis find that the religion—suicide relationship is not gendered. A z-test for significance between the logistic regression coefficients from the male and the female separate analysis found no significant difference. Religious activities protect both men and women from suicide deaths. The extent to which religiousness protects against suicide is essentially the same for males and females. This is the first American study to assess if religion protects women more than men at the individual level.

Findings on the control constructs were mixed. Several significant predictors are new or relatively understudied in the existing literature at the individual level of analysis. Two results, in particular are relatively new: these concern an opportunity and a social integration measure. Residence in a rest home protected against suicide. The higher degree of guardianship in such places is assumed to deter suicide (Wasserman and Stack 2008). Moving to a new residence, residential mobility, enhanced the risk of suicide for both men and women. A sociological perspective on migration generally argues that such change disrupts social networks which protected against suicide (Stack 2000). These findings are in need of replication.

The basic finding that religion protects against suicide is consistent with all five previous American based studies following a cross-sectional design (e.g., [Hilton et al. 2002](#); [Maris 1981](#); [Nisbet et al. 2000](#); [Stack 2009](#); [Stack and Scourfield 2015](#)). The present study's finding that religion protects against suicide is also consistent with most of the prospective or individual longitudinal investigations which also found a protective effect ([Feigelman et al. 2014](#); [Kleiman and Liu 2014](#); [Spoerri et al. 2010](#); [VanderWeele et al. 2016](#)). These previous studies did not, however, perform gender specific analyses. One is restricted to a single occupational group of nurses ([VanderWeele et al. 2016](#)), and, as such, the findings might not be generalizable to a general population of persons from all occupational backgrounds. The present study is based on a broad representative sample of persons with diverse occupational backgrounds. Hence, it helps to establish a religiousness-suicide association on a firmer basis.

The main finding that religiousness protects against suicide is not consistent with four of the previous 13 studies. One is based in China, a largely atheistic nation. As an Asian nation with a rather small religious population, it would not be expected that religion would deter suicide in China ([Hsieh 2017](#)). Two prospective studies did not find an association between religion at baseline and suicide at follow-ups. Both used the same datasets, the merged files of the General Social Surveys and the National Death Index. However, these two studies had the longest window of time between first and only baseline measurement of religiousness and the end of the follow-up period, 37 years in both cases ([Kleiman and Liu 2018](#); [Phillips and Luth 2018](#)). The use of a long follow-up period may offer an explanation of the discrepancy in results between these two studies and the other prospective studies which used a shorter follow-up period.

An advantage of the present research design is that it measures religiousness of the subject at the time of death. This is not true of half of the existing studies. Six of the previous 13 research studies at the individual level are marked by a large number of years (up to 37 years) between the measurement of religiousness at baseline and death by suicide ([Feigelman et al. 2014](#); [Kleiman and Liu 2014, 2018](#); [Phillips and Luth 2018](#); [Spoerri et al. 2010](#); [VanderWeele et al. 2016](#)). To the extent that the religiousness of persons changes over time, there is apt to be measurement error in this longitudinal research. In particular, attendance at religious services, a common measure in the relevant research, declined in the US from 45% in the 1980's to less than 30% in 2010, so this matter is of no small concern ([Kleiman and Liu 2014](#); [Kleiman and Liu 2018](#); [Phillips and Luth 2018](#)). Persons who are religious at baseline may not be so at death up to 37 years later, and visa versa. Ideally, religiousness needs to be measured at the same time or year as death. The present study matches religiousness to the same year as death of the subject.

Additional work is needed to understand what are the principal mechanisms by which religiousness lowers the risk of suicide deaths. ([Koenig et al. 2001, 2012](#)) provide a pair of massive reviews of the literature on religion's associations with both physical and mental health. These volumes contain leads for future work on possible mediators of the religion—suicide linkage. For example, 73% of 40 studies found that religion reduces hopelessness. Hopelessness is a primary risk factor for suicide ([Beck et al. 1989](#)). Depression, another well researched risk factor concerning psychiatric morbidity ([Lester 2000](#)), was predictive of measures of suicidality in 64% of 96 studies done before the year 2000, and 63% of 272 studies done after 2000. Some religions prohibit or discourage smoking behavior, a risk factor for suicidality. Fully 96% of 24 studies determined that a measure of smoking was related to low scores on a measure of religiousness. Substance abuse was relatively low among persons higher in religiousness in 86% of 458 studies. Unfortunately, as shown in [Table 1](#), most research that keys in on suicide deaths and religiousness, does not have measures for a full set of such factors. Many have no data on such possible mediators of the association between religiousness and suicide deaths. For example, none of the 13 studies measured hopelessness and none measured the degree of interaction with co-religionists, a sociological factor known to lower the odds of suicide ([Stack and Kposowa 2016](#)). Research on these and other health mediators is needed as the necessary data become available.

The present study found that suicide ideation was a significant predictor of suicide deaths. In addition, it noted that religiousness was a significant predictor of suicide ideation independent of 15 confounding variables. The higher the level of religiousness, the lower the odds that the subjects were reported to have conveyed the idea that they were seriously considering suicide in the year of death. This is a sign that religious people are less approving or accepting of the idea of suicide.

There is a substantial literature on suicide acceptability which generally finds strong associations between religiousness and low approval of suicide. This is true for large representative samples such as 51,000 persons in the World Values Surveys (Stack and Kposowa 2016). Further, two prospective findings reviewed in Table 1 (Feigelman et al. 2014; Phillips and Luth 2018) both found evidence that the higher the approval of suicide the greater the odds of eventual death by suicide at follow-up. Those two previous prospective studies did not explore the extent to which religiousness predicted suicide acceptability. This linkage can be a starting point for future work.

The present study needs replication using other dimensions of the complex construct of religiousness. Religious activities, the measure employed in the present study taps several possible dimensions of religiosity including private activities such as prayer and public activities such as attendance at religious services and social events with co-religionists. As Koenig et al. (2001) point out, there are at least 13 dimensions of religiosity that have been used in the more general research on religion's contribution to physical and mental health. These include religious coping, knowledge, conversion, orthodoxy, affiliation, and satisfaction. Work using data in the world values surveys has found that all four dimensions of religiousness, for which data were available (affiliation, coping, orthodoxy, activities with co-religionists) were independently related to suicide acceptability (Stack and Kposowa 2016). Nevertheless, measures of certain dimensions of religion may not predict or only weakly predict deaths by suicide. Research is needed on this issue as data become available.

Finally, there is some evidence that scholarly work on suicide completions and religion remains neglected. This is suggested by a content analysis of the 58 articles in the 2017 volume of *Suicide & Life Threatening Behavior*. Only five of the 58 articles deal with suicide deaths and none of these include religiousness as a predictor of suicide. In contrast, 22 include an analysis of suicide ideation, 18 analyze suicide attempts, and five non suicidal self injury. None of the 58 articles focused on religiousness as a possible protective factor against suicide and essentially none included religiousness in their models. The results of 13 studies based on individual level measures of religiousness and suicide deaths suggest that religiousness needs to be included in future work, especially that done in the U.S., in order for models to be fully specified.

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