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## Journal of Economic Behavior &amp; Organization

journal homepage: [www.elsevier.com/locate/jebo](http://www.elsevier.com/locate/jebo)

# Religion and risky health behaviors among U.S. adolescents and adults<sup>☆,☆☆</sup>

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## ARTICLE INFO

## Article history:

Received 12 June 2013

Received in revised form 12 March 2014

Accepted 17 March 2014

Available online 25 March 2014

## JEL classification:

I1

Z12

## Keywords:

Substance abuse

Religion

Intrinsic religiosity

Illicit drug

Adolescence

Young adult

## ABSTRACT

In this paper, we analyze the effects of a broad set of measures of religiosity—religious attendance, prayer frequency, and self-reported importance of religion—on risky health behaviors at different stages of the life course. Using the National Longitudinal Study of Adolescent Health (Add Health), we estimate the contemporaneous as well as medium- and longer-term effects of religiosity during the adolescence years on the use of both licit and illicit substances—cigarette, binge drinking, marijuana, cocaine, methamphetamine, ecstasy, inhalants, LSD, heroin, PCP, and other illegal drugs. Using sibling fixed effects models, we find novel evidence that intrinsic religiosity—self-reported importance of religion—during adolescence has the most significant effects on reducing dependence on use and abuse of addictive substances.

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## 1. Introduction

Risky health behaviors among adolescents and adults, especially tobacco- and substance-use, have been an active research area for health economists (Fletcher, 2012; Cawley and Ruhm, 2011; Clark and Loheac, 2007). For adolescents, in particular, the long-run costs can be high given the effects on ongoing brain development, which can shape impulse control, reward processing, and behavioral inhibition (Friedman, 2013; Clark et al., 2008). Irrespective of these findings, the prevalence rate in 2010 of substance use remains high among adolescents: 21% smoked cigarettes, 18% used marijuana, and 17% used another illegal drug (U.S. Department of Health and Human Services, 2013).

<sup>☆</sup> This research uses data from Add Health, a program project directed by Kathleen Mullan Harris and designed by J. Richard Udry, Peter S. Bearman, and Kathleen Mullan Harris at the University of North Carolina at Chapel Hill, and funded by Grant P01-HD31921 from the Eunice Kennedy Shriver National Institute of Child Health and Human Development, with cooperative funding from 23 other federal agencies and foundations. Special acknowledgment is due to Ronald R. Rindfuss and Barbara Entwisle for assistance in the original design. Information on how to obtain the Add Health data files is available on the Add Health website (<http://www.cpc.unc.edu/addhealth>). No direct support was received from grant P01-HD31921 for this analysis.

<sup>☆☆</sup> We would like to thank Elizabeth Bradley, Daniel Hungerman, Daniel Chen, Adalbert Mayer, Joachim Marti, Justin Cook, Kiersten Strombotne, Michael Richards, and conference participants at NBER Religion and Culture conference (2013) and ASREC (2013), Washington, DC for their helpful comments and discussions.

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Economists have proposed a number of reasons for the continued high rate of substance use among people of all age groups, ranging from genetic to environmental explanations. Yet one potentially influential factor that has received little attention in this literature is the role of religion on risky health behaviors among adolescents and young adults. This paper considers whether a relationship between religion and risky health behaviors helps explain adolescents' and young adults' substance use; in addition, it attempts to re-evaluate and build a more nuanced understanding of the roles that different aspects of religion play in influencing risky health behaviors.

There is hardly an aspect of a society that is untouched by religion (Guiso et al., 2003, p. 226). However, it is not clear if religious belief is a causal factor in shaping the ways individuals and society functions. As Ulmer et al. (2012) has contended, the understanding of the ways religion and its institutions affect human behaviors, in particular, risky health behaviors, is quite insufficient. In particular, our poor understanding of the effects of religion is owing to the daunting empirical challenge in disentangling religious influences from other family background factors. Indeed, to the best of our knowledge, there is no existing study that examines the effects of religiosity and religious participation on risky health behaviors and other health related outcomes using sibling fixed effects—a methodological route that can potentially help in parsing out the effect of religion from family-level unobservables. In addition, we analyze empirically distinct effects of extrinsic versus intrinsic dimensions of religiosity on risky health behaviors.

If—as scholars claim—religion indeed protects people from self-harm (Mellor and Freeborn, 2011; McCullough and Willoughby, 2009), then understanding the mechanism by which religion provides such protection, and the effects of religiosity more broadly, is crucial to understand how to reduce risky health behaviors. Given the multidimensional nature of religiosity, we expand on the existing measures—frequency of religious attendance and prayers—to include a broad measure of religiosity, which captures the self-reported importance of religion (Iannaccone, 1998; Kendler et al., 1997). These measures allow some novel explorations that attempt to separately examine the impacts of religious behaviors that may be socially influenced or sanctioned (attendance and prayer) with those that are intrinsic (reports of importance).

In this paper, we improve on the existing literature in a number of ways. First, in addition to examining the effects of religiosity on tobacco, alcohol, and marijuana use, we expand the list of outcome variables to include the consumption of cocaine, methamphetamines, and other illicit drugs. Second, we investigate contemporaneous effects on risky behaviors as well as medium- and longer-term effects. In order to capture additional dimensions of the longer term health effects of religiosity measured during adolescence, we also utilize information on self-assessed health status of respondents to create a measure of general well-being during young adulthood. Third, as emerging findings from behavioral and molecular genetics indicate the potential role that genes play in predisposing a person to religion and religiosity (Rowthorn, 2011) as well as to additive substance use (Fletcher, 2012), using family fixed effects may help control for genetic endowments shared among the family members (including parental religiosity). Fourth, we show, using Gelbach's (2009) conditional decomposition method, the extent to which variation in family level unobserved heterogeneity contributes to changes in the estimates of the effects of religion on risky health behaviors. Fifth, as an alternative to our family fixed effects models, we separate out the effects of family level effects using a random effects model. In contrast to previous studies, our approach highlights the relative importance of intrinsic religiosity—self-reported importance of religion—viz. a viz. extrinsic religiosity—attendance and prayer frequency—during adolescence that assists individuals in making healthier life-style choice through reducing dependence on use and abuse of addictive substances.

## 2. Literature review

Iannaccone (1998) introduced the framework of a rational choice model to explain religious institutions and adherence to beliefs. Since then the literature has made continuous and sustained efforts in building a better understanding of the economics of religious institutions. Still, the early stage of this literature in examining the effects of religion on risky health behaviors in economics is highlighted by the fact that neither of the two recent handbooks of health economics (Pauly et al., 2011; Glied and Smith, 2011) contains the word 'religion' in the indices. However, more recently there has been a growing literature on this topic by economists and other social scientists (Mellor and Freeborn, 2011; Gruber and Hungerman, 2008; Lillard and Price, 2007; Gruber, 2005; Chatters, 2000).

Lillard and Price (2007) apply various estimation techniques using several nationally representative surveys namely, the Panel Survey of Income Dynamics (PSID), the National Longitudinal Surveys of Youth 1979 (NSLY79), the Children of the National Longitudinal Surveys of Youth 1979 (CNLSY79), and Monitoring the Future (MTF) to show that youth who attend church more often are less likely to show socially deviant behaviors and indulge in risky health behaviors. However, the focus of their study is on religious participation and the authors are unable to fully control for family background.

Gruber (2005) discusses many channels that may explain the positive effects of a higher level of religiosity on various outcomes of interests, including religious participation, education, income, marital status, and also substance use. Given the difficulty in finding instruments that satisfy the exclusion restriction, Gruber and Hungerman (2008) and Hungerman (2010) have taken an alternative approach by studying the response of individuals to the change in the price of secular goods due to changes in policy regimes. For example, Gruber and Hungerman (2008) show that the repeal of 'blue laws' across the US states in the 70s and 80s led to a significant increase in marijuana and cocaine consumption. They suggest that lowering the price of secular activities would reduce religious participation because of its higher opportunity cost. Consequently, if religion provides protection against risky behaviors, then the repeal of "blue laws" would lead individuals to indulge more

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