

# **WORKING PAPER**

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Department of Economics  
Tufts University  
Medford, MA 02155  
(617) 627 – 3560  
<http://ase.tufts.edu/econ>

## **RELIGIOSITY AND HIGH SCHOOL MISBEHAVIOR**

Linda Louny, Associate Professor  
Economics Department  
Tufts University  
Medford, MA 02155

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**Abstract of**  
**Religiosity and High School Misbehavior**

Despite the considerable research work, there are still conflicting views about the efficacy of the estimated relationship between religiosity and deviance. Some analysts contend that the relationship is spurious and is the by-product of left-out variables that alter both religiosity and delinquency. Others argue that the effects of religiosity are large but are mediated through these left-out variables. This paper shows that it is not always possible to distinguish between these two interpretations by simply including measures of the left-out variables. Instead, using an approach that generates statistically consistent parameter estimates in either case, this paper shows that religiosity has a large and significant negative (though possibly indirect) effect on high school anti-ascetic behavior.

## **RELIGIOSITY AND HIGH SCHOOL MISBEHAVIOR**

### **I. Introduction**

A substantial body of research concludes that religiosity reduces delinquency and other forms of deviant behavior. However, some analysts contend that the relationship is spurious and is the by-product of left-out variables that alter both religiosity and delinquency. This conclusion is usually based on the small and insignificant estimated effects of religiosity when measures of these other variables are included in the analysis. An alternative interpretation of these findings is that the effects of religiosity are large but are mediated through these left-out variables. The distinction between mediated and spurious effects is important for drawing implications from the evidence. This paper shows that it is not always possible to distinguish between these two interpretations by simply including measures of the left-out variables and that this approach can, in some cases, produce misleading results.

### **II. Literature Review and Empirical Model**

Most early multivariate analyses of the effects of religiosity estimate the following relationship:

$$(1) \quad Y = \beta_1 X_1 + X_2 \beta_2 + \varepsilon_2$$

where  $Y$  measures deviant behavior,  $X_1$ , religiosity, and  $X_2$ , other pre-determined observed background characteristics. The overwhelming majority of these analyses report that higher levels of religiosity are associated with lower levels of deviance (see Tittle and Welch, 1983; Freeman, 1986; Sloane and Potvin, 1986; Chadwick and Top, 1993; Johnson et al, 2000a; and Johnson et al 2000b). Other analysts (Cochran et al,

1994; Benda and Corwyn, 1997; Ellis and Thompson, 1989) argue that significant, negative values of  $\beta_1$  do not imply that religiosity generates less deviance. They posit that deviance depends on variables other  $X_1$  and  $X_2$  and that these variables also affect religiosity. In this case, the true model is:

$$(2) \quad Y = \beta_1 X_1 + X_2 \beta_2 + \lambda_1 Z + \varepsilon_2^*$$

$$(3) \quad X_1 = \alpha_1 Z + \alpha_2 X_2 + \alpha_3 V + \varepsilon_3.$$

where  $Z$  are factors affecting  $Y$  that are usually not observed and  $V$  are observed variables that affect religiosity but not delinquency or  $Z$ . For example, in describing arousal theory, Cochran et al (1994) state that “persons vary in the degree to which they are neurologically predisposed to criminality” and such persons “are unlikely to find religion and/or religious services neurologically satisfying” (p. 95). Their impulsivity and thrill-seeking ( $Z$ ) generate both more criminal activity ( $Y$ ) and less religious activity ( $X_1$ ) but religiosity and criminal activity are otherwise unrelated ( $\beta_1=0$ ). The expected value of  $\beta_1$ ,  $E(\beta_1)$  when estimating equation (1) would equal  $\beta_1 + R_{X_1Z}\lambda_1$  where  $R_{X_1Z}$  is the correlation between religiosity ( $X_1$ ) and the unobservable ( $Z$ ) holding  $X_2$  constant. Thus, even if the true value of  $\beta_1$  equals zero, the estimated effect from equation (1) may be statistically significant because it includes this spurious correlation,  $R_{X_1Z}\lambda_1$ . Changes in religiosity would not generate changes in deviant behavior. Religiosity and deviance are related only because both are determined by a third factor,  $Z$ .

Many analysts handle this problem by estimating equation (2) with proxies for the unobserved factors ( $Z$ ) to reduce  $R_{X_1Z}\lambda_1$ . An insignificant value of  $\beta_1$  is regarded as evidence that the original significant, negative value of  $\beta_1$  from equation (1) was spurious. Cochran et al (1994) show that the estimated effects of measures of religiosity

fell sharply when variables consistent with arousal theory were included in the analysis. In most cases, the religiosity effects were no longer significant. They concluded that “these results provide qualified support for charges of spuriousness in the religiosity-delinquency correlation” (p. 113). Drawing conclusions from a similar analysis, Benda and Corwyn (1993) stated that “church attendance and religiosity are related to status offenses until elements of control theory are added to demographic variables in multivariate analyses. These results indicated that the relationships between measures of religion and status offenses are spurious” (p. 89) (see also Ellis and Thompson, 1989). This conclusion is warranted in cases where the proxies for  $Z$  are pre-determined or exogenous relative to religiosity. Examples include proxies closely tied to neurological concepts of arousal (Cochran et al, 1994).

In other cases, the problem with this interpretation of  $\beta_1$  is that equation (3) is not the only possible way to specify the relationship between religiosity,  $X_1$  and unobserved variables,  $Z$ . The ambiguity occurs because, unlike variables such as parents’ education, religiosity is not clearly pre-determined or exogenous relative to  $Z$  nor is  $Z$  pre-determined or exogenous relative to religiosity. For example, it is possible that “religion may be acting as an antecedent influence that helps create a family and peer environment not conducive to delinquent behavior” (Elifson et al. 1983 p. 524). This mediating variables approach substitutes the following for equation (3):

$$(4) \quad X_1 = \rho_1 X_2 + \rho_2 V + \epsilon_4$$

$$(5) \quad Z = \delta_1 X_1 + \delta_2 X_2 + \epsilon_5$$

Religiosity ( $X_1$ ) is determined by  $X_2$  and by  $V$ . The variable  $Z$  is, in turn, determined by religiosity. The direction of the causality is opposite of equation (3). In this case, the

expected value of  $\beta_1$  from estimating equation (1), would equal  $\beta_1 + \delta_1\lambda_1$  where  $\beta_1$  is the direct effect of religiosity on deviant behavior and  $\delta_1\lambda_1$  is the indirect effect mediated through  $Z$ . Finding an insignificant  $\beta_1$  coefficient when proxies are added for  $Z$  to the analysis only implies that the direct effect is small. This means that, unlike the spurious correlation case, changes in religiosity would generate changes in deviant behavior. However, these changes are indirect through religiosity's effect on  $Z$ .

One explanation for such mediating effects is social control theory. It argues that individuals with weak connections to society and their family may lack restraint over natural deviant urges (Benda and Corwyn, 1997). Religiosity increases the restraining connections between individuals and social groups. These restraining connections, in turn, reduce deviance. A variety of other theoretical mechanisms could also generate such mediating effects (see Tittle and Welch, 1983). Religious individuals may be more likely to conform to social rules due to belief in supernatural sanctions for deviating. Furthermore, religious individuals may be less likely to be exposed to social norms favoring deviance.

The distinction between mediating effects and spurious correlation is important for interpreting results. To give an example in a different context, Phillips et al (1998) show that reduced-form effect of mother's education on children's test scores is large, positive, and significant. However, when measures of mother's cognitive achievement is included in the analysis, the coefficient drops substantially and becomes insignificant. This decline is an example of mediating effects. The conclusion to be drawn is not that the correlation between mother's education and children's test scores is spurious and that mother's education plays little role in determining children's performance. It is rather

than that mother's education operates largely through altering mother's cognitive skills. Differences in mother's education across groups as well as changes over time would then affect children's test scores albeit indirectly. Similar conclusions should be drawn if the effects of religiosity are mediated through more proximate determinants of delinquency.

A third possible alternative occurs if both equations (3) and (5) are correct. That is,  $X_1$  and  $Z$  are simultaneously determined. Benda (1995, p. 461) concludes that "it is plausible that religiosity, like other elements of social control has a reciprocal relationship to some forms of delinquency". More generally, the cognitive dissonance literature contends that, not only do attitudes alter actual behavior, but behavior may alter attitudes about acceptable actions (see Festinger, 1957; Davis and Jones, 1960; Glass, 1964; and Jellison and Mills, 1967). Consistent and unbiased estimates of the effect of the  $X_1$  from equation (2) cannot be found using OLS or other techniques that do not control for this simultaneity. The estimated effect of  $\beta_1$  is a combination of  $\beta_1$ ,  $\delta_1$ ,  $\alpha_1$ , and  $\lambda_1$  (see Greene, 1993 pp. 597-598 for a related example). The resulting wide range of these possible combinations may account for the contradictory findings about the relationship between religion and delinquency found in the previous literature.

This analysis implies that estimating equation (2) with proxies for  $Z$  does not necessarily solve the problem of interpreting a significant  $\beta_1$  from estimating equation (1). As implied by Cochran et al (1994) and Benda and Corwyn (1997), a significant  $\beta_1$  when estimating equation (2) using OLS or a similar technique does not necessarily mean that there is a causal relationship. The proxies used to replace  $Z$  may not be adequate. In addition, however, an insignificant or small  $\beta_1$  when estimating equation (2) does not necessarily mean that the correlation is spurious. Most of religiosity's causal effects may

be mediated through other more proximate determinants of deviance or religiosity and deviance may be simultaneously determined.

One alternative approach (see Greene, 1993 pp. 603-604) that generates consistent estimates of the reduced-form effect of religiosity is two-stage least squares (2SLS). Potential candidates for instruments include variables ( $V$  in equations 3 and 4) that affect church attendance but do not alter deviant behavior ( $Y$ ) or the unobservables ( $Z$ ) holding  $X_1$  and  $X_2$  constant. The first-stage creates an estimated value of religiosity,  $X_1^{\wedge}$ , based on  $V$  and other exogenous variables,  $X_2$ . The second-stage regresses  $Y$  on  $X_1^{\wedge}$  and  $X_2$ . Any spurious correlation between  $X_1$  and  $Z$  is removed from the second-stage regression since  $V$  and thus  $X_1^{\wedge}$  are not correlated with  $Z$ .

In general, a priori expectations about the religiosity-deviance relationship depend on the type of behavior analyzed. According to Benda and Corwyn (1997), “the ‘Antiascetic Hypothesis’ [holds] that behaviors that violate ascetic values, but are not consistently disapproved in secular settings are more likely to be affected by religiosity than are behaviors that clearly violate societal laws”. Other mechanisms outside the bounds of religiosity that provide more powerful, direct, positive motivations (e.g. as implied by arousal theory) are required to explain serious violations of the law. Thus, according to the “Antiascetic Hypothesis”, these more serious violations would not be affected by religiosity.

Many analysts have attempted to determine whether the wide array of religiosity-deviance results can be resolved by making such distinctions. In some cases, they find evidence that religiosity is more highly correlated (negatively) with antiascetic behavior or status offenses such as marijuana or heavy alcohol use (Elifson et al, 1983; Hadaway

et al, 1984, Albrecht et al, 1977) than with serious crimes. In some cases, they report little relationship between the type of deviance and the effects of religiosity (Benda, 1995). This paper estimates the effects of religiosity on high school anti-ascetic behaviors. These behaviors are characterized by the ambiguity in secular norms and values that provide avenues of religiosity's effects according to control theory.

### **III. Data and Empirical Results**

The data used in this analysis comes from the National Education Longitudinal Study sponsored by the National Center for Education Statistics<sup>1</sup>. Individuals were drawn from a nationally representative sample of 800 public and 200 private schools. Within the school sample, eighth graders were randomly selected for the base year 1988 interviews. Three follow-ups were administered to the same students in 1990, 1992, and 1994. The data gathered by the survey provides information about the transitions that individuals make as they move from grade to high school and then to college and/or employment. The analysis is weighted to correct of the initial nonrandom sample and the subsequent sample attrition. The sample used here includes all of 1990 sample white males and females with nonzero weights<sup>2</sup>.

The means and standard deviations, and definitions of the variables used in the analysis are listed in Table 1. The religious person index ranges from 1 for individuals who, in 1990, do not regard themselves as religious at all to 3 for individuals who thought of themselves as very religious. The index of anti-ascetic behavior was based on responses to how many times in the first half of the 1990 school year (10<sup>th</sup> grade) that the individual (1) got in trouble for not following school rules, (2) was put on an in-school

suspension, (3) was suspended or put on probation from school, (4) was transferred to another school for disciplinary reasons, and (5) got into a physical fight at school. The first four items were coded as 0 for never, 1.5 for 1-2 times, 4.5 for 3-6 times, 8 for 7-9 times and 12 for over 10 times. The last item was coded as 0 for never, 1.5 for 1-2 times, and 4 for more than twice. The total possible ranges from 0 to 52. Consistent with the definition of high school misbehavior as antiacademic activity, Table 1 shows that about half of the respondents engaged in at least one high school misbehavior.

The first column of Table 2 lists OLS results of regressing the index of antiacademic behavior on a variety of individual and family background characteristics. Similarly to many past analyses, column 1 shows that lower parents' schooling and more siblings (Benda and Corwyn, 1997) increase the number of antiacademic high school behaviors. In addition, females and members of several religious denominations reported fewer antiacademic behaviors compared to males and to those who reported no or other denominations.

The column 1 of Table 2 also shows that religiosity is negatively correlated with high school misbehavior. Since the religiosity index ranges from 1 to 3, the  $-0.773$  coefficient for religiosity implies a 1.5 difference in the expected number of antiacademic high school behaviors for individuals who do not regard themselves as religious at all (24 percent of the sample) compared to those who regard themselves as very religious (11 percent of the sample)<sup>3</sup>.

Two indices were used to capture elements of social control and arousal theory. Index 1 equals the sum of the 1990 responses (10<sup>th</sup> grade) to how often the individual felt it was okay to (1) be late for school, (2) cut a couple of classes, (3) skip school for a

whole day, and (4) disobey school rules. Index 2 equals the sum of 1990 (10<sup>th</sup> grade) responses to how often the individual felt it was okay to (1) get into a physical fight, (2) belong to a gang, (3) steal belongings from school, and (4) destroy school property, (5) bring weapons to school, and (6) abuse teachers. Responses for each of these categories range from 1 for often to 4 for never so that higher responses correspond to fewer restraints on the individual's behavior. Since the indexes includes 4 and 6 items respectively, their values range from 4 to 16 and from 6 to 24. These items are similar to the measures of beliefs in Benda and Corwyn (1997) and Benda (1995) – (1) it is OK to sneak into a movie or ball game without paying, (2) it is important to pay for all things taken from a store, (3) it is OK to steal a bicycle if you can do it without getting caught, and (4) it is important to try to follow rules and obey laws.

Column 2 of Table 2 shows that, when estimating equation (2) by adding these indices as the Z variables, the coefficient of religiosity drops to slightly more than one-quarter of its original value (-0.773 to -0.208). One conclusion that could be drawn is that most of the initial estimated effect of religiosity is spurious and is due to the arousal/social control variables. However, as indicated above, this conclusion may be incorrect for two reasons. First, the effects of religiosity may operate indirectly through measures of social control and/or arousal. That is, equations (4) and (5) are correct instead of equation (3). Second, variables capturing delinquency and social control/arousal may be simultaneously determined. For example, individuals who feel that it is OK to disobey school rules may be more likely to get in trouble for not obeying school rules. In addition, individuals who actually got in trouble for not following school rules may justify their behavior by asserting that it is OK to disobey school rules.

According to the model presented earlier, both equations (3) and (5) would be correct. In this case, the estimated effect of  $\beta_1$  is a combination of  $\beta_1$ ,  $\delta_1$ ,  $\alpha_1$ , and  $\lambda_1$ . OLS and other techniques that do not address this simultaneity problem would generate biased and statistically inconsistent estimates.

Column 3 of Table 2 shows that 2SLS results using the V variables (from equations 3 and 4) as instruments. Candidates for instruments include variables that are correlated with religiosity but are uncorrelated with deviant behavior (Y) or with the unobservables (Z) (holding  $X_1$  and  $X_2$  constant). The instruments used for this 2SLS analysis were (1) parents' reports of whether in 1988 (during 8<sup>th</sup> grade) the individual had studied religion outside of regular school, (2) the fraction of the individual's school who were the same denomination as the respondent<sup>4</sup>, and (3) the average of the religiosity index for the individual's school. The last two items were based all of the other sample members in the individual's school (excluding the value for the individual him/herself)<sup>5</sup>.

Column 3 of Table 2 shows that the absolute value of the 2SLS religiosity coefficient (0.8773) is large and significant. This means that exogenous (or predetermined) component of religiosity substantially reduced high school anti-ascetic behavior. In fact, although the difference is not significant, the absolute value of the 2SLS religiosity coefficient in column 3 is slightly larger than the one in column 1. The latter may, in fact, be biased towards zero due to measurement error. Measurement error problems would occur if the religiosity index used here does not reflect the full range of individual differences. The effects of measurement error in the multivariate context are ambiguous. However, in the one-variable case, measurement error biases results toward zero (see Greene, 1993).

The NELS data includes a measure of frequency of church attendance<sup>6</sup>. The complete results using church attendance and the religiosity index together are not reported here. Frequency of church attendance was not only insignificant holding the religiosity index constant (coefficient of -0.0018 with standard error 0.0028), but the point estimate implies a small effect. Those who attended church for 52 weeks out of the year would average only 0.09 fewer anti-ascetic behaviors than those who never attended ( $52 \times -0.0018 = -0.0936$ ). While Chadwick and Top (1993) also found that church attendance had no significant effect on delinquent activity, they found that private religious beliefs and integration into the church community significantly reduced occurrences.

The value of the 2SLS results hinge on whether the instruments are, first, correlated with religiosity and, second, uncorrelated with deviant behavior (Y) or with the unobservables (Z) (holding  $X_1$  and  $X_2$  constant). Column 1 of Table 3 presents the stage-one of the 2SLS results showing that all three instruments had large and significant effects on whether the individual's 1990 (during 10<sup>th</sup> grade) reports of religiosity. While this correlation would be expected, it is less certain, a priori, that these instruments would be uncorrelated with deviant behavior (Y) or with the unobservables (Z) (holding  $X_1$  and  $X_2$  constant). Individuals whose parents reported that they participated in religious activities in grade 8 or who attended schools where religiosity is high may not be random samples of the population. In such a case, the chosen instruments would be capturing part of the effects of unobserved variables that affect delinquency (e.g. high degree of parental supervision or low levels of desired arousal). Column 2 of Table 3 shows that, holding 1990 individual religiosity and the exogenous variables constant, none of the

instruments used here had any influence on 1990 high school anti-ascetic behaviors. Any effect of the instruments on delinquency appears to operate through 1990 religiosity or the other  $X_2$  variables included in the analysis. This conclusion is supported by the finding (column 3 of Table 3) that, holding individual religiosity constant, the instruments were also unrelated to self-reports of delinquency<sup>7</sup>. Such evidence implies that the three instruments are not inadvertently measuring the effects of significant left-out variables. Griliches (1976) and Blackburn and Neumark (1992) relied on similar reasoning to validate instruments for ability in earnings regressions.

#### **IV. Discussion**

According to estimates from equation (1), religiosity is negatively correlated with anti-ascetic high school behaviors. This result would be spurious if religiosity and deviance are related only because both are determined by some third factor. The two approaches for handling this problem are (1) ordinary least squares estimation adding proxies for the unobservables and (2) two-stage least squares using estimated values of religiosity based on predetermined or exogenous variables.

The differences in results between these two approaches in this paper are striking. The OLS coefficient is about one-quarter as large as the original one, while the 2SLS coefficient is slightly larger than the original. The key to understanding the apparent conflict is that the proxies used here (and in other studies) to capture unobserved individual characteristics are not clearly exogenous or pre-determined relative to religiosity. Social control theory states that religion may be acting as an antecedent influence that shapes the family and peer environment. In this case, the smaller

coefficient with the proxies included does not imply that the initial results were spurious. The results would be interpreted to mean that most of the effect of religiosity is mediated through social control variables. The distinction between spurious correlation and mediated effect is important. Only in the latter case will changes in religiosity over time or variation across groups result in differences in delinquency.

In addition, the cognitive dissonance literature posits that behavior affects attitudes. As such, high school misbehavior and the unobservables may be simultaneously determined. The estimated coefficients of religiosity in analyses adding proxies for unobservables would then be biased and statistically inconsistent. In particular, OLS estimates may combine the effects of several parameters in equations (2) – (5). This bias may explain some of the contradictory findings about the relationship between religiosity and delinquency found in the previous literature. In general, the results in this paper support the conclusion that religiosity has a large and significant negative (though possibly indirect) effect on the types of high school anti-ascetic behavior measured here.

Table 1. Means and Standard Deviations of Variables

High school misbehavior index	1.9579 (4.0209)
Whether misbehaved in high school	0.4504 (0.4976)
Mother's education	10.8076 (5.8638)
Don't know mother's education	0.2051 (0.4038)
Father's education	10.8239 (6.3009)
Don't know father's education	0.2269 (0.4188)
Father - professional worker	0.2685 (0.4432)
Mother - professional worker	0.1848 (0.3881)
Family income/1000	28.9757 (22.8807)
Don't know family income	0.1906 (0.3928)
Number of siblings	2.2664 (2.1689)
Female-headed household	0.3222 (0.4673)
Female	0.4968 (0.5000)

Table 1. Means and Standard Deviations of Variables (cont.)

Baptist	0.1497 (0.3568)
Episcopal	0.0150 (0.1215)
Lutheran	0.0559 (0.2297)
Methodist	0.0629 (0.2429)
Presbyterian	0.0312 (0.1738)
Catholic	0.2466 (0.4310)
Pentecostal	0.0229 (0.1496)
Other Protestant	0.0223 (0.1477)
Frequency of church attendance	24.5062 (23.2631)
Religious person index	1.8767 (0.5872)
Social control/arousal index 1	13.3531 (2.3687)
Social control/arousal index2	23.1496 (1.7623)
School - religious person index	1.8859 (0.2523)

Table 1. Means and Standard Deviations of Variables (cont.)

School – denomina- tion fraction	0.3824 (0.3253)
Studied religion outside school	0.3869 (0.4871)
Trouble-maker in 10th grade	0.2848 (0.5269)
N	12,126

Standard deviations are in the parentheses.

Table 2. Estimated Effects of Selected Variables on High School Misbehavior

	OLS	OLS with proxies	2SLS
Constant	5.5237 (0.4735)	26.5709 (1.5698)	5.6518 (0.4934)
Mother's education	-0.0326 (0.0294)	-0.0463 (0.0270)	-0.0360 (0.0295)
Don't know mother's education	-0.5399 (0.4700)	-0.6291 (0.4094)	-0.5514 (0.4694)
Father's education	-0.1023 (0.0235)	-0.0642 (0.0198)	-0.0970 (0.0239)
Don't know father's education	-1.2901 (0.4201)	-0.7030 (0.3386)	-1.2674 (0.4246)
Father - professional worker	-0.1283 (0.1212)	-0.1580 (0.1106)	-0.1145 (0.1195)
Mother - professional worker	-0.0819 (0.1494)	0.1153 (0.1443)	-0.0952 (0.1483)
Family income/1000	0.0045 (0.0031)	0.0014 (0.0025)	0.0046 (0.0031)
Don't know family income	0.1648 (0.1637)	0.2624 (0.1382)	0.2252 (0.1614)
Number of siblings	0.1864 (0.0359)	0.0961 (0.0277)	0.2010 (0.0363)
Female-headed household	-0.0198 (0.1321)	0.1991 (0.1143)	-0.0541 (0.1310)
Female	-1.5570 (0.1020)	-0.7201 (0.0827)	-1.5231 (0.1037)

Table 2. Estimated Effects of Selected Variables on High School Misbehavior (cont.)

	OLS	OLS with proxies	2SLS
Baptist	0.1952 (0.1556)	0.0378 (0.1299)	0.2302 (0.1656)
Episcopal	0.1276 (0.3147)	-0.2891 (0.2784)	0.1384 (0.3221)
Lutheran	-0.3649 (0.1764)	-0.4748 (0.1668)	-0.3561 (0.1808)
Methodist	-0.4869 (0.1650)	-0.6934 (0.1391)	-0.4848 (0.1692)
Presbyterian	-0.1801 (0.3742)	-0.5324 (0.3080)	-0.1918 (0.3751)
Catholic	0.0944 (0.1443)	-0.0570 (0.1263)	0.0466 (0.1478)
Pentecostal	-0.0197 (0.2920)	-0.2156 (0.2290)	-0.0091 (0.3163)
Other Protestant	-0.2300 (0.2401)	-0.6368 (0.1892)	-0.1900 (0.2496)
Other or no denomination	-	-	-

Table 2. Estimated Effects of Selected Variables on High School Misbehavior (cont.)

	OLS	OLS with proxies	2SLS
Religious person index	-0.7729 (0.0999)	-0.2082 (0.0941)	-0.8773 (0.2501)
Social control/arousal index 1		-0.4535 (0.0360)	
Social control/arousal index2		-0.7153 (0.0760)	
R <sup>2</sup>	0.0712	0.3072	0.0716

Standard errors are in the parentheses. N=12126

Table 3. Estimated Effects of Selected Variables on High School Misbehavior and Religiosity

	Index of religiosity	Index of high school misbehavior	Perceived as trouble- maker
Constant	0.2520 (0.0735)	5.5711 (0.5419)	0.7294 (0.0681)
Mother's education	0.0031 (0.0039)	-0.0361 (0.0297)	-0.0041 (0.0042)
Don't know mother's education	0.0481 (0.0557)	-0.5545 (0.4722)	-0.0785 (0.0615)
Father's education	0.0068 (0.0033)	-0.0973 (0.0236)	-0.0063 (0.0035)
Don't know father's education	0.0834 (0.0496)	-1.2721 (0.4206)	-0.1073 (0.0544)
Father - professional worker	0.0139 (0.0168)	-0.1164 (0.1206)	0.0013 (0.0162)
Mother - professional worker	0.0061 (0.0182)	-0.0958 (0.1495)	0.0086 (0.0203)
Family income/1000	-0.0002 (0.0004)	0.0047 (0.0031)	0.0008 (0.0004)
Don't know family income	0.0453 (0.0229)	0.2152 (0.1618)	0.0013 (0.0219)
Number of siblings	-0.0047 (0.0032)	0.2012 (0.0366)	0.0228 (0.0031)
Female-headed household	-0.0120 (0.0137)	-0.0518 (0.1284)	-0.0444 (0.0148)

Table 3. Estimated Effects of Selected Variables on High School Misbehavior and Religiosity (cont.)

	Index of religiosity	Index of high school misbehavior	Perceived as trouble- maker
Female	0.0706 (0.0126)	-1.5296 (0.1010)	-0.1816 (0.0126)
Baptist	0.1273 (0.0197)	0.2177 (0.1570)	0.0092 (0.0195)
Episcopal	0.0406 (0.0490)	0.1273 (0.3233)	-0.0100 (0.0414)
Lutheran	0.0823 (0.0292)	-0.3683 (0.1991)	0.0421 (0.0294)
Methodist	0.0966 (0.0259)	-0.5036 (0.1838)	-0.0117 (0.0269)
Presbyterian	0.0751 (0.0371)	-0.2068 (0.4112)	0.0021 (0.0434)
Catholic	0.0519 (0.0172)	0.0487 (0.1496)	0.0314 (0.0186)
Pentecostal	0.3118 (0.0393)	-0.0472 (0.2946)	-0.0157 (0.0312)
Other Protestant	0.0149 (0.0717)	-0.1899 (0.1076)	0.0315 (0.0449)
Other or no denomination	-	-	-

Table 3. Estimated Effects of Selected Variables on High School Misbehavior and Religiosity (cont.)

	Index of religiosity	Index of high school misbehavior	Perceived as trouble- maker
Religious person index		-0.7719 (0.2453)	-0.1256 (0.0131)
School - religious person index	0.6981 (0.0297)	-0.0385 (0.2096)	-0.0128 (0.0254)
School - denomination fraction	0.1142 (0.0222)	-0.0468 (0.2539)	-0.0390 (0.0306)
Studied religion outside of school in 8th grade	0.1721 (0.0133)	-0.0411 (0.1116)	0.0015 (0.0144)
R <sup>2</sup>	0.1517	0.0718	0.0678

Standard errors are in the parentheses. N=12126.

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## Footnote

<sup>1</sup> For additional details, see National Center for Education Statistics (1995).

<sup>2</sup> Blacks were not included in the sample because the estimated effects of religiosity (described below) were statistically different from those of whites. In addition, because of the smaller sample size for blacks, the two-stage least squares coefficient for religiosity was imprecisely estimated.

<sup>3</sup> In separate regressions are run for women and men, the estimated coefficients for white men and women are similar in size and not statistically different at  $-0.842$  (0.152) for the men and  $-0.696$  (0.128) for the women. In addition, changing the definition of antiascetic behavior does not change the results. If only the first two items (got in trouble for not following school rules and was put on an in-school suspension) were included as antiascetic behavior, the estimated coefficient and standard error would be  $-0.594$  (0.069).

<sup>4</sup> The denominations included were Baptist, Episcopal, Lutheran, Presbyterian, Methodist, Pentecostal, other Protestant, Catholic, Jewish, Mormon, Eastern religion, Moslem, and all other denominations. Those who reported no denomination were recorded as the fraction of their high school classmates who also reported no denomination.

<sup>5</sup> The mean number of individuals interviewed per school during the 10<sup>th</sup> grade was 90.

<sup>6</sup> The question is 'how often do you attend religious services?'. The responses were coded as 52 for once or more than once a week, 30 for 2-3 times a month, 12 for once a month, 6 for several times a year, and 0 for not at all.

<sup>7</sup> The extent to which the respondent thinks that other students see him/her as a trouble-maker was coded as 0 for not at all, 1 for somewhat, and 2 for very.

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