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# ***LABOR INCOME AND RELIGIOSITY: EVIDENCE FROM SURVEY DATA***

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## **ABSTRACT**

Using data from the 1996-2004 General Social Survey, this research examines the relationship between labor income and religiosity for individuals. The research hypothesis is that the labor income and religiosity relationship is affected by endogeneity creating a bias. The model employs instrumental variable estimations for men and women separately to test the hypothesis. The expectation is for men and women to differ as established by research on labor market outcomes and religious behavior. Initial ordinary least squares results reveal that labor income and frequency of prayer have a statistically significant negative correlation for men. A \$52,631 increase in labor income reduces frequency of prayer by once per week. There is no statistically significant relationship between labor income and frequency of attendance for men. Empirical results with instrumental variables estimation suggest that labor income is a poor predictor of frequency of prayer and frequency of attendance for men. A statistically significant negative correlation between labor income and frequency of attendance does not exist when utilizing instrumental variables. Bias attributed to noncognitive factors is suggested as accounting for these results. Using wages for a robustness check indicates similar results with wages as poor predictor of frequency of prayer and frequency of attendance regardless of estimation technique. Labor income for women is a statistically significant negative correlate of frequency of prayer and frequency of religious service attendance when employing ordinary least squares. Estimates using ordinary least squares show that a \$125,000 increase in labor income reduces frequency of religious service attendance by once per month and a \$27,778 increase in labor income reduces prayer frequency by once per week for women. Instrumental variables results reveal that labor income is a poor determinant of frequency of prayer and frequency of attendance. A robustness check using wages in place of labor income reveals similar results for women. Instrumental variables diagnostic tests indicate a weak instrument problem for women when using wages as a predictor. **JEL Classifications:** J00, Z1

## **INTRODUCTION**

Research on the relationship between income and religious determinants has been ongoing for several years. Modern findings begin with Weber (2001[1905]), who argues that income and Protestant adherence are positively related. Azzi and

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Ehrenberg (1975) explore a backward bending relationship between income and frequency of religious attendance, where attendance initially increases then declines with income, in their work. Lipford and Tollison (2003), meanwhile, control for simultaneity between income and frequency of religious service attendance. I present new empirical evidence in this paper by examining endogeneity between labor income and religiosity with the measures of prayer frequency and attendance frequency. I also argue that there is no significant relationship between income and religiosity.

This study is helpful for three reasons. First, this study employs a new instrumental variables approach for investigating the relationship between religiosity and income. Second, it is the first attempt to control for endogeneity when examining the relationship between frequency of prayer and income. This study contends that previous estimates of the correlation between frequency of prayer and income and between frequency of attendance and income are affected by bias by not accounting for noncognitive skills. This bias leads to imprecise estimates of the magnitude of the relationship between religiosity and income. Third, this study reviews the relatively under-studied measure of prayer frequency. Prayer is examined to better understand the relationship between income and religiosity and because it can be considered a better measure of religiosity. It is argued that prayer is a more private religious activity that is less tainted by ulterior motives.

Estimating the relationship between income and religiosity for men and women is performed separately because findings are expected to differ by gender as research on labor market outcomes and religious behavior confirms. The empirical results suggest that labor income is a poor predictor of both frequency of religious service attendance and prayer frequency for men when accounting for endogeneity. Ordinary least squares results indicate that a \$52,631 increase in labor income reduces frequency of prayer by once per week. This magnitude is 7.6 times greater than the estimates reported by Brown (2009), which this study closely follows. Using instrumental variables leads to statistical insignificance for the coefficient on income. Robustness checks using wages reveal similar findings.

Results for women show that labor income is negatively correlated with frequency of religious service attendance and prayer frequency when employing ordinary least squares. A \$125,000 increase in labor income reduces frequency of religious service attendance by once per month and a \$27,778 increase in labor income reduces prayer frequency by once per week using ordinary least squares. The ordinary least squares magnitude for frequency of prayer is greater in size by a factor of 6.06 in comparison to estimates reported by Brown (2009). There is no significant correlation between labor income and the frequency of religious service attendance or prayer frequency when employing an instrumented variable. Similar results are obtained when conducting a robustness check using wages. A weak instrument problem is indicated for women when using wages as a predictor with a first stage F-test statistic on the instrument below 10.

This paper is divided into 5 sections. The data and theory section discusses the measures in use, the theoretical relationship between income and religiosity, and the endogeneity problem. It also reviews the data. The econometric model section develops the estimation framework, the results section presents the empirical results, and the final section concludes the paper.

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## DATA AND THEORY

The data are from the General Social Survey (GSS), a nationally representative sample of American adults conducted by the National Opinion Research Center at the University of Chicago. The dataset is a pooled cross section with data generated every two years for 14,130 respondents from 1996 to 2004. Approximately 1,500-4,500 individuals are surveyed each time the GSS is administered for the pooled cross section. Cross section data is not used before 1996 or after 2004 to follow Brown (2009) closely. Similar results to Brown (2009) are obtained when using all available GSS data, which was limited to 1994-2010 when this study began. The similar results suggest that nothing has changed in relating labor income to religiosity in the recent past. After restricting to individuals who are religious and eliminating individuals with missing or unreported data of interest, the final datasets consists of 4,229 respondents.<sup>1</sup> Weighted descriptive statistics of the final datasets are similar to the full range of data available for the weighted dataset before restrictions. Therefore, it can be concluded that the final weighted dataset is fairly nationally representative. The dataset is weighted to account for the number of persons over 18 in the household for all years in addition to adjusting for non-response. These weights are used to make the estimates as nationally representative as possible.

### Dependent Variables

The dependent variables in this study are frequency of prayer and frequency of religious service attendance. Frequency of prayer is originally a categorical variable broken down into six categories in this study. Following Brown (2009), frequency of prayer is converted into a numerical variable in this study. For the numerical conversion “never” equals 0, “less than once a week” equals 0, “once a week” equals 1, “several times a week” equals 3, “once a day” equals 7, and “several times a day” equals 21. Altering this conversion slightly where appropriate does not significantly alter the results obtained. The transformation leaves frequency of prayer measured in number of prayers per week.

According to Gill (2005), prayer is defined as human communication with divine and spiritual entities. The determinants of prayer frequency are closely examined in this study for two reasons. First, frequency of prayer has received relatively little attention in previous work exploring the relationship between religion and income. Only Brown (2009), Iannaccone (1990), and Branas-Garza and Neuman (2004) explore the relationship between frequency of prayer and income.

Second, the contention is made that frequency of prayer is a better measure of religiosity. To describe why frequency of prayer may be a better measure of religiosity, a formal theoretical approach that adds to Brown (2009) is developed. Let  $r$ ,  $a$ , and  $p$  represent religiosity, frequency of religious service attendance, and frequency of prayer, respectively, and assume  $r$ ,  $a$ , and  $p$  are greater than or equal to 0. Let  $\theta_a$  and  $\theta_p$ , meanwhile, stand for noise that falsely portrays religiosity. Observed religiosity in the form of frequency of attendance and frequency of prayer is defined as follows:

$$a = r + \theta_a, \theta_a > 0 \text{ and } \theta_a \sim N(0, \sigma_a^2)$$

$$p = r + \theta_p, \theta_p > 0 \text{ and } \theta_p \sim N(0, \sigma_p^2)$$

If  $\theta_a > \theta_p$ , then frequency of prayer more accurately proxies the underlying religiosity than does attendance. It is likely that  $\theta_a > \theta_p$  because some individuals

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who attend religious services may do so for social benefits while giving little credence to a religious tradition. For instance, Sacerdote and Glaeser (2001) suggest that churches act as civic organizations where more frequent church attendance may increase social capital through networking, thus leading to higher incomes. Individuals who attend for social reasons tend to pray less, showing less commitment to religious principles than their frequency of attendance implies. Therefore, frequency of prayer is a more private religious activity that is less tainted by ulterior motives such as the private benefit from social interactions.

Similar to frequency of prayer, frequency of attendance is a categorical variable with nine categories in this study. These categories are converted to numerical measurements so that frequency of attendance is measured in number of services attended per month. For the conversion, “never” equals 0, “less than once a year” equals 0, “once a year” equals (1/12), “several times a year” equals (1/2), “once a month” equals 1, “2-3 times a month” equals (5/2), “nearly every week” equals 4, “every week” equals (13/3), and “more than once a week” equals (13/2). Altering this conversion slightly where appropriate does not significantly alter the results obtained. Prior studies affirm frequency of religious service attendance as a measure for religiosity. Azzi and Ehrenberg (1975), for example, examine religious service attendance in relation to a household’s allocation of time. Lipford and Tollison (2003) analyze simultaneity between religiosity and income through considering religious service attendance and income. Gruber (2004), finally, reviews the impact of subsidized charitable giving on religious service attendance. Other studies looking at frequency of attendance include Smith and Sawkins (2003), Gruber and Hungerman (2008), and Sullivan (1985) among others. Noting the importance of religious service attendance as an indicator of religiosity, it is also utilized within this paper.

### **Income**

The primary explanatory variable of this study, labor income, is measured as a respondent’s annual real labor income in thousands of year 2004 dollars.<sup>2</sup> As an alternative to this measure for robustness checks, wages are constructed in tens of year 2004 dollars following Brown (2009) by taking labor income and dividing it by the product of number of hours worked last week and number of weeks worked last year. Wages are set to 0 when labor income is 0 or weeks worked in the previous year is 0 or number of hours worked last week is 0. Annual non-labor income, which is measured in thousands of year 2004 dollars, is also included.<sup>3</sup>

As a market variable that influences market and non-market behavior, this study focuses on labor income, the amount earned annually from working, as a determinant of religiosity within this study. Research on religiosity using income or a similar determinant such as wages, the amount earned per hour from working, has yielded mixed results. For example, Iannaccone (1990) uses General Social Survey (GSS) data from 1983 to 1987 and finds no correlation between family income and frequency of prayer. Branas-Garza and Neuman (2004) also find no correlation using 1998 data on Catholics in Spain from the Center for Sociological Research. As a general finding, Iannaccone (1998) contends that while income strongly predicts religious contributions of money, it is a poor predictor of other measures of religious activity such as church attendance, church membership, and rates of religious belief. Estimates he presents using 1990 General Social Survey data on family income substantiate his claims that income is a weak correlate of religious attendance. Brown (2009),

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meanwhile, with GSS data from 1996 to 2004, finds a statistically significant negative correlation between wages and frequency of prayer. Following Brown (2009), this study also utilizes wages as part of its empirical strategy with GSS data from 1996 to 2004.

While findings are mixed, it is proposed that there is a negative relationship between labor income and religiosity that represents a tradeoff between religious and secular activity. Iannaccone (1988) and Azzi and Ehrenberg (1975) support this argument by developing utility maximization models where there is a tradeoff between time spent in religious activity and time spent in secular activity. In other words, time spent at work, a secular activity, must be traded off against time spent in religious activities such as prayer or religious service attendance. Therefore, a negative relationship between labor income and religiosity exists because labor income depends upon time spent at work. This hypothesis is examined empirically using an econometric model in this study.

### **Control Variables**

For the religious upbringing control variables, the religion the respondent was raised in at age 16 and how fundamentalist the religion was in which the respondent was raised at age 16 are used. Other control variables include employment status, age, geographic mobility, sex, marital status, race, ethnicity, educational attainment, and region where the respondent was interviewed.

### **Endogeneity**

Research on the relationship between income and religious determinants does not consider potential problems stemming from unobservable characteristics such as noncognitive skills. Noncognitive skills can be defined as skills stemming from motivation, personality traits, and persistence, according to Heckman, Stixrud, and Urzua (2006). A growing body of research such as Heckman et al. (2006) and Fortin (2008) explores noncognitive skills and estimate their effects on market outcomes. These noncognitive skills are typically measured using questionnaires such as the Rotter (1996) Locus of Control Scale and Rosenberg (1965) Self-Esteem Scale. The Rotter scale indicates the degree of control individuals feel they possess over their life, also known as locus of control. It is used in studies such as Heckman et al. (2006) and Groves (2005) to evaluate the impact of noncognitive skills on labor outcomes. Locus of control measures individuals on a continuum from external to internal. Individuals with a higher internal locus of control tend to believe that control of their life comes from within themselves while individuals with a higher external locus of control tend to believe that control of their life comes from outside themselves.

Psychological studies such as Fiori, Hays, and Meador (2004), Spilka, Shaver, and Kirkpatrick (1985), and McIntosh, Silver, and Wortman (1993) note that religion offers extrinsic control, such as prayer and attendance, and intrinsic control, such as belief that everything will turn out well if an individual trusts in a spiritual or divine deity. In this study, only religion measures related to extrinsic control are considered because data on religion measures related to intrinsic control such as belief that everything will turn out well are rarely collected in national surveys and are not easily quantified.

Within this paper, the argument is made that, by not accounting for noncognitive skills, endogeneity is present in the religiosity and income relationship. This omitted variable leads to biased estimates. A direction is not assigned to this bias because other omitted factors such as what Iannaccone (1990) calls religious human capital (e.g. being raised in a home where religious doctrines, rituals, and traditions

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are emphasized) are also not included or accounted for in the estimating equations or the analysis in this paper. At best, a positive bias in the relationship between religiosity and income can be suggested. The bias is also not quantified because of the possibility of other omitted factors. The following three propositions summarize the argument to be investigated in this paper:

1. On average, higher levels of internal perceived control are associated with higher wages that increase labor income. Heckman et al. (2006), for instance, find that as individuals obtain a higher internal locus of control, their wages are higher through direct effects on productivity and indirect effects on schooling and work experience.
2. On average, as individuals increase outward forms of religious behavior such as prayer or attending religious services, it indicates a higher internal locus of control. Ellison and Burdette (2012) find that extrinsic religious orientation correlates negatively with an internal locus of control. In essence, internal locus of control will tend to be associated with higher levels of extrinsic religious participation such as religious service attendance or prayer.
3. Propositions (1) and (2) present an endogeneity problem when estimating the correlation between labor income and religious activity. Specifically, a biased relationship between labor income and religious activity can be obtained using ordinary least squares due to bias from the omission of noncognitive skills as measured by locus of control. Through the use of instrumental variables, I will test to see if this argument is valid.

The instrumental variable in the study is prestige of the spouse's occupation. This measure is set equal to 0 when the respondent has no spouse. The prestige score ranges from 0 to 100 where a higher prestige score indicates a more prestigious occupation. I later discuss the requirements of a good instrumental variable and the choice of spouse prestige as the instrumental variable in the instrumental variable subsection.

### **Descriptive Statistics**

Table 1 presents weighted descriptive statistics for the sample. The table is divided among four types of variables—dependent, primary variables of interest (labor income, wages, non-labor income, and the instrumental variable spouse prestige), religious upbringing, and control.

Table 1 reveals that average frequency of prayer is 8.71 times per week. The average respondent attends religious services 2.12 times per month. Average labor income per year is \$28,950, average wage is \$16.20, and average nonlabor income per year is \$31,050.

The religious upbringing variables in Table 1 show that 97 percent of the sample is religious at age 16, with 33 percent Catholic, 61 percent Protestant, 2 percent Jewish, and 1 percent Other. It also shows that the sample is 34 percent Fundamentalist, 45 percent is Moderate, and 21 percent is Liberal. The control variables reveal that 75 percent is employed, 25 percent is not employed, average age is 45.67 years, and 66 percent are living in the state in which they lived at age 16. The gender breakdown is 53 percent women and 45 percent men. Marital status decomposes into 59 percent married, 6 percent widowed, and 15 percent divorced or separated. The racial composition is 13 percent black and 7 percent



other race or ethnicity. For educational attainment, 12 percent of the sample is less than high school, 56 percent is high school graduates, 7 percent associates degree holders, 16 percent bachelors degree holders, and 8 percent graduate degree holders.

## ECONOMETRIC MODEL

### Estimating Equations

This study uses pooled cross section ordinary least squares and two stage least squares with weighting. The equations below describe the model specification.

$$\text{Pray}_{it} = \alpha + \beta Y_{it} + \omega \text{Rel16}_{it} + \delta X_{it} + \rho d_t + \varphi s_{ik} + \varepsilon_{it} \quad (1)$$

$$\text{Attend}_{it} = \theta + \gamma Y_{it} + \kappa \text{Rel16}_{it} + \mu X_{it} + \nu d_t + \os_{ik} + \eta_{it} \quad (2)$$

The dependent variables frequency of prayer and frequency of attendance of person  $i$  in year  $t$  are represented by  $\text{Pray}_{it}$  and  $\text{Attend}_{it}$ . Endogenous labor income is denoted by  $Y_{it}$ .<sup>4</sup> The vector  $\text{Rel16}_{it}$ , meanwhile, contains six dummies, Catholic, Protestant, Jewish, Other, Fundamentalist, and Moderate for religion raised in at age 16.

The vector  $X_{it}$  contains the control variables, which include employment status, age, geographic mobility, marital status, race, ethnicity, and educational attainment. Time dummies and region of interview  $k$  dummies correspond to  $d_t$  and  $s_{ik}$ , respectively. The error term is represented by  $\varepsilon_{it}$  in the estimating equation for prayer and  $\eta_{it}$  in the estimating equation for attendance.

Estimates are run separately for men and women as in Brown (2009) and Branas-Garza and Neuman (2004). The estimates are performed separately because of expected differences in religious participation and labor market outcomes for men and women. It is well established in studies such as Miller and Hoffman (1995), Thompson Jr. (1991), and Collett and Lizardo (2009) that men have lower levels of religiosity than women. The precise reasons for this trend are debated and usually ascribed to physiological, environmental, or behavioral differences as discussed in Stark (2002), Bradshaw and Ellison (2009), and Cornwall (2009) among others. Research on labor market outcomes also notes significant differences by gender. Altonji and Blank (1999), for instance, use the Current Population Survey to show that average wages and labor force participation rates for men are higher than women over time after controlling for various factors such as education, experience, occupation, industry, and job characteristics. Pencavel (1986) and Killingsworth and Heckman (1986) conduct thorough surveys of the male labor supply and female labor supply, respectively, in the United States, Canada, Great Britain, and Germany to reveal significant differences in labor force participation rates, hours worked, and occupational distribution. Reasons for the differences by gender in labor market outcomes, as uncovered in theoretical research, are preference differences, comparative advantage, human capital investments, and discrimination, according to Altonji and Blank (1999).

### Instrument

Given an ordinary least squares estimation of a dependent variable on a set of independent variables where one is endogenous, a good instrument requires strong correlation between the instrument and the endogenous variable. It also requires no correlation between the instrument and the residuals of the originally specified

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estimating equation. Furthermore, the instrumental variable should not be directly correlated with the dependent variable and only be correlated with the dependent variable through correlation with the endogenous variable. A weak instrument problem arises when correlation between the instrument and the residuals of the original estimation equation is relatively stronger than the correlation between the endogenous variable and the instrument. To test for weak instruments in this study, F-tests are conducted on the instrumental variable in the first stage regression. F-statistic values less than 10 indicate a weak instrument problem according to Staigler and Stock (1997).

To address the endogeneity problem with the model to be estimates, two-stage least squares is utilized with the General Social Survey's prestige scores for the spouse's occupation, which is referred to as spouse prestige, as the instrumental variable. The prestige score ranges from 0 to 100 where a higher prestige score indicates an occupation is more prestigious. Spouse prestige is set equal to 0 in cases where the respondent has no spouse. Empirical evidence such as Brown (2013) indicates that labor income and spouse prestige should be positively correlated.

Theoretically, one concern over using spouse prestige as an instrument comes from positive assortative mating. Positive assortative mating means that individuals tend to marry individuals with similar socioeconomic status, which includes similar education and professional background. Positive assortative mating implies that spouse prestige is correlated with an individual's own prestige. If an individual's own occupational prestige is correlated with religiosity as other indicators of socioeconomic status are, such as education in Sacerdote and Glaeser (2001), then spouse prestige could be correlated with religiosity. Ordinary least squares regressions of equations (1) and (2) are conducted with spouse prestige included as an explanatory variable to determine if spouse prestige directly impacts frequency of religious service attendance or frequency of prayer. Results are discussed in the next section.

## RESULTS

First stage regressions with sample weights appear in Table 2. Ordinary least squares and second stage regressions with sample weights are presented in Tables 3-6. All tables are similarly organized. In Tables 3-6, the first and third columns represent results from running ordinary least squares with sample weights. The remaining columns present the second stage regressions for instrumental variables with sample weights. Tables 7 and 8 present ordinary least squares regressions that include spouse education as a determinant with sample weights. Chow tests are conducted and find that each estimating equation estimated should be done separately for men and women with all F-statistics  $\geq 1.90$  and  $p < 0.01$ , which implies rejection of the null that there is no difference between male and female findings. A weakness of the Chow test is that it allows for no differences at all between coefficient estimates for men and women and does not reveal the exact sources of the disparity. It only estimates an overall difference in coefficient estimates. Even so, the tests indicate that there is a divergence between men and women. The distinction is most likely due to differences in religiosity such as in Miller and Hoffman (1995), Thompson Jr. (1991), and Collett and Lizardo (2009) and differences in labor market outcomes such as in Altonji and Blank (1999), Pencavel (1986), and Killingsworth and Heckman (1986).

Table 2 displays first stage regressions. When using labor income as the dependent variable, the instrumental variable spouse prestige is statistically



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significant at the one percent threshold for men and women. Using wages as the dependent variable, the instrumental variable spouse prestige is statistically significant at the one percent level for men and statistically significant at the ten percent level for women. The evidence, therefore, indicates a weak correlation between wages and spouse prestige for women, which suggests a weak instrument problem.

Table 3 shows that labor income has a very small negative effect on the frequency of religious service attendance for women with statistical significance at the one percent threshold using ordinary least squares. The magnitude of the coefficient indicates that a \$125,000 increase in labor income reduces frequency of religious service attendance by once per month. Instrumenting leads to the coefficient on labor income becoming statistically insignificant. Men, meanwhile, display no statistical significance for the coefficient on labor income regardless of estimation technique. The instrument F-Statistics for men and women at magnitudes of 15.92 and 12.57, respectively, do not suggest a weak instrument problem.

Table 4 presents that men and women both have statistically significant coefficients for the ordinary least squares effect of labor income on frequency of prayer. Specifically, a \$52,631 increase in labor income leads to a reduction of one prayer per week for men while a \$27,778 increase leads to a reduction of one prayer per week for women. These magnitudes are greater than findings by Brown (2009), who contends that \$90,700 and \$87,160 increases in labor income are required to reduce frequency of prayer by one per week for men and women, respectively. When instrumenting, the coefficient for labor income becomes statistically indistinguishable from 0 for both men and women. The instrument F-Statistics are identical to those reported in Table 3 at magnitudes of 15.92 and 12.57 for men and women, respectively, and do not suggest a weak instrument problem.

Table 5 shows that the wage is a poor predictor of frequency of attendance for men. Women are initially estimated to have wages negatively affect frequency of attendance with statistical significance at the one percent level. An increase of \$400 decreases frequency of religious service attendance by once per month. Instrumenting for wages leads to a statistically insignificant coefficient on wages for women. While the instrument F-Statistic for men is greater than 10 at a size of 12.68, the instrument F-Statistic for women is less than 10 at a size of 3.44. In essence, the evidence suggests a weak instrument problem for women.

Table 6 displays wages as negatively affecting frequency of prayer for women using ordinary least squares with statistical significance at the one percent level. A \$90.09 increase for women is associated with a reduction of one prayer per week. This magnitude is less than Brown (2009), who predicts that a \$43.58 increase in wages for women reduces frequency of prayer by one per week. When instrumenting for wages, the coefficient on wages becomes statistically insignificant for women. The relationship between frequency of prayer and wages is statistically insignificant for men in all cases. The instrument F-Statistics are identical to those presented in Table 5 with magnitudes of 12.68 for men and 3.44 for women. The evidence indicates a weak instrument problem for women because the instrument F-Statistic is less than 10.

Tables 7 and 8 reveal that spouse prestige does not affect either frequency of prayer or frequency of attendance directly. While there is no statistical test to validate spouse prestige as an adequate instrumental variable, the empirical evidence available from the first stage regressions in Table 2, instrument F-Statistics in Tables 3-6, and direct correlations in Tables 7 and 8 do not suggest a weak instrument problem for men

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in all cases. For women, the evidence in Tables 2-7 does not suggest a weak instrument problem when using spouse prestige as an instrument for labor income. Evidence does, however, suggest a weak instrument problem for women when spouse prestige is used as an instrument for the wage. Despite the weak instrument problem for women when instrumenting for wages, alternative instruments perform worse.<sup>6</sup> Given these findings on the instrumental variable spouse prestige, it is concluded that the instrumental variable results are reliable when instrumenting for income regardless of gender. The robustness check reveals that spouse prestige is problematic as an instrument for women's wages. Ordinary least squares results are more reliable in the case of wages for women.

The instrumental variables results indicate that labor income is a poor determinant of the frequency of prayer and the frequency of religious service attendance regardless of gender. This finding coincides with Iannaccone (1998), who finds that income is a poor determinant of religious activity with the exception of religious contributions of money. The instrumental variable results for labor income reject the hypothesis that there is a negative relationship between labor income and religiosity that represents a tradeoff between religious and secular activity. Accounting for potential bias stemming from noncognitive skills and other factors such as religious human capital appears to matter. The instrumental variables results also show that wages are a poor determinant of frequency of prayer and frequency of religious service attendance for men. This result is contrary to Brown (2009), who finds a statistically significant negative correlation between wages and the frequency of prayer for men.

The ordinary least squares results for women when using wages as a regressor indicate that the wage is a negative correlate of frequency of prayer. A tradeoff between religious and secular activity, as hypothesized, appears to exist for women when evaluating the relationship between wages and the frequency of prayer. This finding coincides with theories and findings from Azzi and Ehrenberg (1975) and Iannaccone (1988).

For the other variables appearing in Tables 3-6, being raised Fundamentalist is consistently positive with statistical significance at the one percent level in all cases. Being raised Jewish is consistently negative and statistically significant at the ten percent threshold or lower. In essence, respondents who are raised Jewish exhibit lower frequency of prayer and frequency of religious service attendance. Respondents raised in a Fundamentalist religion have higher frequencies of prayer and religious service attendance. Iannaccone (1998) supports this finding by highlighting that a positive correlation between any measure of religious commitment such as prayer or attendance and the conservatism, strictness, or sectarianism of a religious group should exist.

## CONCLUSIONS

The results of this study provide initial evidence that a \$52,631 increase in labor income reduces frequency of prayer by once per week for men. Further evidence using instrumental variables reveals that labor income is a poor determinate of frequency of prayer and frequency of religious service attendance regardless of gender. This finding supports Iannaccone (1998), who finds that income is not a significant correlate of religious activity with the exception of religious monetary contributions. These results hold for men when a robustness check is conducted using wages. The results using instrumental variables estimation refute the hypothesis that there is a negative relationship between labor income and religiosity that represents a tradeoff between religious and secular activity.

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A weak instrument problem appears for women when conducting a robustness check using wages. Ordinary least squares results are considered as adequate for women when using wages as a determinant. Magnitudes for women when using wages as correlate indicate that frequency of prayer is less sensitive to changes in wages than in Brown (2009). It is estimated that a \$90.09 increase in wages for women is associated with a reduction of one prayer per week. The magnitude for frequency of attendance and wages for women indicates that a \$400 increase in wages decreases frequency of religious service attendance by once per month for women. Results for women when using wages appear to support the hypothesis that there is a tradeoff between religious and secular activity that is captured in the relationship between wages and the frequency of prayer.

This study offers insight into the relatively understudied measure of prayer frequency by being the first to consider endogeneity in the frequency of prayer and labor income or frequency of prayer and wages relationships. By examining endogeneity with the General Social Survey, it is revealed that ordinary least squares results for frequency of prayer are still reliable for women when using wages instead of income as a determinant given the available data. It is also shown with additional evidence that ordinary least squares results for frequency of religious service attendance with General Social Survey data are dependable for women when using wages instead of income.

Further research should identify better instruments and use extensive panel data on frequency of prayer and frequency of religious service attendance if it becomes available. Restricted data on the location of GSS respondents should also be obtained to employ clustering and other grouped-data methods. If information becomes available on the average length of time per prayer, it should be utilized. Time use studies should also be incorporated as part of future work if they measure time spent on prayer. The possibility of exploring the relationship between noncognitive traits and other measures of religious commitment should also be carried out.

## **APPENDIX**

### **Exclusion of Observations**

This study loses 1,990 observations by only including respondents with a religious identity, 6,575 observations due to missing or non-response data on frequency of prayer, 717 observations due to missing or non-response data on family income and respondent income, 6 observations due to missing or non-response data on age, 60 observations due to missing or non-response data on frequency of attendance, 10 observations due to missing or non-response data on education degree completed, 1 observation due to missing or non-response data on marital status, 5 observations due to missing or non-response data on religious identity at age 16, 123 observations due to missing or non-response data on how fundamentalist was the religion in which the respondent was raised, 15 observations due to missing or non-response data on remaining in the same state, 371 observations due to missing or non-response data involved with construction of the wages measure, and 28 observations due to missing or non-response data for occupational prestige of a respondent's spouse.

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## Treatment of Labor and Non-Labor Income

### Labor Income

GSS income data are collected categorically but are transformed into semi-continuous data by a three step process. The three steps include: using midpoints of the categories as a measure of central tendency, calculation of the mean income in the top unbounded category through use of the Pareto distribution, and scaling income data across years into constant year 2000 dollars. For example, a respondent reports that he or she is in income category 2, which means the respondent earned between \$1000 and \$5000 in the previous year. The transformation uses the midpoint of \$3000 and adjusts for inflation to report an income in year 2000 dollars for the respondent. The top income category, meanwhile, uses a process involving the Pareto distribution since it is unbounded from above. For more details, please see GSS Methodological Reports No. 64 and 101. Data for labor income are taken from the GSS measure CONRINC. It is based on the RINCOME measure which is built solely on asking each respondent what their income was in the previous year from working. The GSS does not report any income data that indicate a respondent has 0 labor income. To help keep observations where a respondent's labor income must be 0 in the sample, missing or non-response labor income data are replaced with 0 in cases where the respondent reports working 0 weeks in the previous year. This replacement is justified since the GSS measure RINCOME is built solely on asking each respondent what their income was in the previous year from working. A respondent must have no labor income in the previous year if they did not work any weeks at all in the previous year. This replacement results in saving 105 observations for the final pooled cross section sample.

### Non-labor income

Non-labor income is computed by subtracting a respondent's real labor income from real family income using the GSS measures CONRINC and CONINC, respectively. In cases where a respondent's real labor income exceeds real family income, non-labor income equals 0. This adjustment is only necessary for 75 respondents or less than 2 percent of the sample. In each case where the adjustment is made respondents report being in the top category for both real labor income and real family income. The transformation process of the top category of income data, therefore, is the reason the adjustment is made. For more details, please see GSS Methodological Reports No. 64 and 101.

## Instrumental Variables

### Spouse education and spouse prestige

As a first step, six instrument possibilities are evaluated: highest year of school completed by the respondent's father (father education), highest year of school completed by the respondent's mother (mother education), highest year of school completed by the respondent's spouse (spouse education), father's occupational prestige (father prestige), mother's occupational prestige (mother prestige), and spouse's occupational prestige (spouse prestige). To begin, the sample is restricted to all relevant variables and all six instrument possibilities. The resulting sample is 3496 observations. Using bivariate correlations, prestige of occupation and highest year of school completed are highly correlated. Bivariate correlations are run on spouse prestige and spouse education,

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mother prestige and mother education, and father prestige and father education. On this basis, first stage regressions are estimated with only the three prestige measures included and repeat the first stage with only the three education measures included.

For the first stage regressions using prestige, spouse prestige is statistically significant most frequently with 4 of 4 cases statistically significant at the ten percent level or lower. For the first stage regressions using education, spouse education is statistically significant most frequently with 4 of 4 cases statistically significant at the ten percent level or lower. To evaluate spouse prestige and spouse education further, each is included in separate regressions estimating equations (1) and (2) using the full final sample of 4,229 observations. As presented in Tables 7 and 8, spouse prestige is not directly correlated with the dependent variable in any regression presented. Spouse education, meanwhile, is directly correlated with the dependent variable in 2 of 8 regressions. Because of this direct correlation with the dependent variable, it is decided empirically to use spouse prestige as an instrument. Moreover, theoretically, problems from positive assortative mating are more likely to be present when using spouse education because previous empirical evidence directly links education and religiosity, as in Sacerdote and Glaeser (2001), while to my knowledge there are no studies directly linking occupational prestige and religiosity.

#### Alternative Instrument Strategies

A number of alternative instrument choices are investigated. A sample size of 4,527 respondents is used in each case, which are obtained by restricting for all measures except spouse prestige, to analyze each alternative. An idea stemming from Oreopoulos et al (2006), where the authors show that graduates entering the labor market in a recession year suffer damages to earnings for the first 8 to 10 years, labor market entry in a recession is explored in several different ways. Data is used from the National Bureau of Economic Research on business cycle expansions and contractions available at <http://www.nber.org/cycles.html>. Dummies are created for potential labor market entry in a recession year, fifteen recession cohorts to correspond with 15 recessionary periods from 1918-2001, potential labor market entry in a recession year conditional on being in the labor force less than or equal to 10 years, and potential entry in a recession year multiplied by the number of months in a recession during the year of entry. Running each dummy alone in separate first stage regressions identical to those presented in Table 2, evidence reveals weak or no statistical significance for coefficients on the dummy measures in the regressions. On this basis using labor market entry in a recession year as an instrument is ruled out.

As another idea from Welch (1979) and Berger (1985), dummies for generational cohorts as instruments are attempted. Specifically, birth cohort dummies are created for the Greatest Generation (1901-1924), Silent Generation (1925-1945), Baby Boomers (1946-1964), Generation X (1965-1981), and Generation Y (1982-2000). The Greatest Generation dummy is omitted and first stage regressions are run as in Table 2 with the remaining four cohort dummies as instruments. Results reveal little or no statistical significance on the dummy coefficients in the first stage regressions run. This result remains regardless of which generation cohort is treated as omitted. From these findings using generational birth cohort dummies as instruments is ruled out.

As an alternative, dummies are created for 10 year birth cohorts (1907-1916, 1917-1926, 1927-1936, 1937-1946, 1947-1956, 1957-1966, 1967-1976, and 1977-1986) in accordance with the range of birth years in the sample. As with the generation

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cohorts, little or no statistical significance appears on the dummy coefficients in the first stage regressions regardless of which 10 year cohort is treated as the omitted category. Therefore, using 10 year birth cohort dummies as instruments is dismissed.

Size of the birth cohort in the year a respondent is born is also considered by collecting data on the number of births per year and the birth rate per year as defined by number of births per 1,000 people in the population for use as possible instruments. Data are from Vital Statistics of the United States, 1995, Volume I, Natality, table 1-1, Live births, birth rates, and fertility rates, by race: United States, 1909-1995. Four first stage regressions are run as in Table 2 using number of births per year in the year the respondent is born as the instrumental variable and statistical significance is found in some cases. This process is repeated separately for birth rate per year in the year the respondent is born as the instrumental variable and statistical insignificance is found in some cases. While there is some correlation for both measures, it is not as strong as spouse prestige, where 4 of 4 first stage regressions contain a statistically significant coefficient for spouse prestige. Thus, to avoid a weak instrument problem, number of births per year in the year the respondent is born and the birth rate per year in the year the respondent is born are eliminated as possible instruments.

Exploring graduation cohorts as instruments, size of a graduation cohort in the potential year a respondent received their highest terminal degree if their highest degree is either a high school diploma or a Bachelors degree is examined. U.S. data is collected from 1925-2004 on the number of high school graduates per year, the high school graduation rate per year as defined by the number of high school graduates divided by the number of 17 year olds in the population in October of the final school year, the number of bachelors degrees awarded per year, and the number of bachelors degrees awarded per year by gender. The data are from the National Center for Education Statistics Digest of Education Statistics for 1959-2004 and the Biennial Survey of Education in the United States for 1925-1958. Each of the five graduate cohort measures is run separately as the only instrumental variable in 4 first stage regressions as in Table 2. For the number of high school graduates, statistical insignificance is present in the regressions. The high school graduation rate, meanwhile, displays statistical insignificance on its coefficient in some cases. The total number of bachelors degrees, number of bachelors degrees earned by men, and number of bachelors degrees earned by women show statistical insignificance in some cases. None of these results for the five graduate cohort measures indicate a stronger instrument than spouse prestige. In essence, using any of the five graduate cohort measures as instruments in favor of using spouse prestige is ruled out.

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<sup>1</sup>See the Appendix for detailed information on lost observations due to missing or non-response data. The dataset is restricted to religious individuals only to follow Brown (2009).



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<sup>2</sup>See the Appendix for detailed information on the labor income measure in this study.

<sup>3</sup>See the Appendix for detailed information on the non-labor income measure. Non-labor income is computed by subtracting the respondent's labor income from family income. It stems primarily from two sources—spousal income and income from assets.

<sup>4</sup>Contrary to Brown (2009), who uses a quadratic specification for wages, a linear specification of labor income is employed. A linear specification is used because studies featuring income such as Iannaccone (1998) and Branas-Garza and Neuman (2004) also use a linear specification. Furthermore, previous drafts of this research invoked a quadratic specification that was problematic due to significant weak instrument problems as detailed by the Appendix. An anonymous referee also strongly encouraged the use of a linear specification.

<sup>5</sup>See the Appendix for details concerning other instruments attempted for use as part of this study.

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## REFERENCES

- Altonji, J. G., & Blank, R. (1999). Race and Gender in the Labor Market. In O. Ashenfelter & D. Card (Eds.), *Handbook of Labor Economics* (Vol. 3C). New York: Elsevier.
- Azzi, C., & Ehrenberg, R. (1975). Household Allocation of Time and Church Attendance. *Journal of Political Economy*, 83(1), 27-56.
- Bradshaw, M., & Ellison, C. G. (2009). The Nature-Nurture Debate is Over, and Both Sides Lost! Implications for Understanding Gender Differences in Religiosity. *Journal for the Scientific Study of Religion*, 48(2), 241-251.
- Branas-Garza, P., & Neuman, S. (2004). Analyzing Religiosity within an Economic Framework: The Case of Spanish Catholics. *Review of Economics of the Household*, 2(1), 5-22.
- Brown, T. T. (2009). Rational praying: The economics of prayer. *The Journal of Socio-Economics*, 38(1), 37-44.
- Collett, J. L., & Lizardo, O. (2009). A Power-Control Theory of Gender and Religiosity. *Journal for the Scientific Study of Religion*, 48(2), 213-231.
- Cornwall, M. (2009). Reifying Sex Differences isn't the Answer: Gender Processes, Risk, and Religiosity. *Journal for the Scientific Study of Religion*, 48(2), 252-255.
- Ellison, C. G., & Burdette, A. M. (2012). Religion and the Sense of Control Among U.S. Adults. *Sociology of Religion*, 73(1), 1-22.
- Fiori, K. L., Hays, J. C., & Meador, K. G. (2004). Spiritual Turning Points and Perceived Control Over the Life Course. *International Journal of Aging and Human Development*, 59(4), 391-420.
- Fortin, N. M. (2008). The Gender Wage Gap among Young Adults in the United States: The Importance of Money versus People. *The Journal of Human Resources*, 43(4), 884-918.
- Gill, S. D. (2005). Prayer. In L. Johnes (Ed.), *Encyclopedia of Religion* (2nd ed., Vol. 11, pp. 7367-7372). Detroit: Macmillan Reference USA.
- Groves, M. O. (2005). How Important is Your Personality? Labor Market Returns to Personality for Women in the U.S. and U.K. *Journal of Economic Psychology*, 26(6), 827-841.
- Gruber, J. (2004). Pay or Pray? The Impact of Charitable Subsidies on Religious Attendance. *The Journal of Public Economics*, 88(12), 2635-2655.
- Gruber, J., & Hungerman, D. M. (2008). The Church Versus the Mall: What Happens When Religion Faces Increased Secular Competition? *Quarterly Journal of Economics*, 123(2), 831-862.
- Heckman, J. J., Stixrud, J., & Urzua, S. (2006). The Effects of Cognitive and Noncognitive Abilities on Labor Market Outcomes and Social Behavior. *Journal of Labor Economics*, 24(3), 411-482.
- Iannaccone, L. R. (1988). Formal Model of Church and Sect. *American Journal of Sociology*, 94, 241-268.
- Iannaccone, L. R. (1990). Religious Practice: A Human Capital Approach. *Journal for the Scientific Study of Religion*, 29(3), 297-314.
- Iannaccone, L. R. (1998). Introduction to the Economics of Religion. *Journal of Economic Literature*, 36(3), 1465-1496.

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- Killingsworth, M. R., & Heckman, J. J. (1986). Female Labor Supply: A Survey. In O. Ashenfelter & R. Layard (Eds.), *Handbook of Labor Economics* (Vol. 1, pp. 103-204). New York: North-Holland.
- Lipford, J. W., & Tollison, R. D. (2003). Religious participation and income. *Journal of Economic Behavior and Organization*, 51(2), 249-260.
- McIntosh, D. N., Silver, R. C., & Wortman, C. B. (1993). Religion's Role in Adjustment to a Negative Life Event: Coping with the Loss of a Child. *Journal of Personality and Social Psychology*, 65(4), 812-821.
- Miller, A. S., & Hoffman, J. P. (1995). Risk and Religion: An Explanation of Gender Differences in Religiosity. *Journal for the Scientific Study of Religion*, 34(1), 63-75.
- Pencavel, J. (1986). Labor Supply of Men: A Survey. In O. Ashenfelter & R. Layard (Eds.), *Handbook of Labor Economics* (Vol. 1, pp. 3-102). New York: North-Holland.
- Rosenberg, M. (1965). *Society and the Adolescent Self-Image*. Princeton, NJ: Princeton University Press.
- Rotter, J. B. (1996). *Generalized Expectancies for Internal Versus External Control of Reinforcement*. Washington, DC: American Psychological Association.
- Sacerdote, B., & Glaeser, E. L. (2001). *Education and Religion*. NBER Working Paper Series, Working Paper 8080.
- Smith, I., & Sawkins, J. W. (2003). The economics of regional variation in religious attendance. *Applied Economics*, 35(14), 1577-1588.
- Spilka, B., Shaver, P., & Kirkpatrick, L. A. (1985). A General Attribution Theory for the Psychology of Religion. *Journal for the Scientific Study of Religion*, 24(1), 1-20.
- Staigler, D., & Stock, J. H. (1997). Instrumental Variables Regression with Weak Instruments. *Econometrica*, 65(3), 557-586.
- Stark, R. (2002). Physiology and Faith: Addressing the "Universal" Gender Differences in Religious Commitment. *Journal for the Scientific Study of Religion*, 41(3), 495-507.
- Sullivan, D. H. (1985). Simultaneous Determination of Church Contributions and Church Attendance. *Economic Inquiry*, 23(2), 309-320.
- Thompson Jr., E. H. (1991). Beneath the Status Characteristic: Gender Variations in Religiousness. *Journal for the Scientific Study of Religion*, 30(4), 381-394.
- Weber, M. (2001[1905]). *The Protestant ethic and the spirit of capitalism* (S. Kalberg, Trans.). Chicago: Fitzroy Dearborn.

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**Table 1: Descriptive Statistics for Weighted Dataset**

Variable	Obs	Mean	Std. Dev.	Min	Max
Dependent Variables					
Frequency of Prayer Per Week	4229	8.71	8.09	0	21
Frequency of Attendance Per Month	4229	2.12	2.20	0	6.5
Primary Variables					
Labor Income (Thousands of 2004 dollars)	4229	28.95	37.90	0	258.58
Wages (Tens of 2004 dollars)	4229	1.62	4.40	0	129.29
Non-labor Income (Thousands of 2004 dollars)	4229	31.05	36.88	0	182.57
Spouse Prestige	4229	25.56	24.67	0	86
Religious Upbringing Variables					
Raised Catholic	4229	0.34	0.47	0	1
Raised Protestant	4229	0.60	0.49	0	1
Raised Jewish	4229	0.02	0.15	0	1
Raised Other	4229	0.01	0.10	0	1
Raised None	4229	0.03	0.17	0	1
Raised Fundamentalist	4229	0.34	0.47	0	1
Raised Moderate	4229	0.45	0.50	0	1
Raised Liberal	4229	0.21	0.41	0	1
Control Variables					
Employed	4229	0.75	0.43	0	1
Not Employed	4229	0.25	0.43	0	1
Age	4229	45.67	16.24	18	89
Lived in Same State as When Aged 16	4229	0.66	0.47	0	1
Women	4229	0.53	0.50	0	1
Men	4229	0.47	0.50	0	1
Never Married	4229	0.20	0.40	0	1
Married	4229	0.59	0.49	0	1
Widowed	4229	0.06	0.24	0	1
Divorced/Separated	4229	0.15	0.35	0	1
White	4229	0.81	0.39	0	1
Black	4229	0.13	0.33	0	1
Other Race/Ethnicity	4229	0.07	0.25	0	1
Less Than High School	4229	0.12	0.33	0	1
High School Graduate	4229	0.56	0.50	0	1
Associates Degree	4229	0.07	0.26	0	1
Bachelors Degree	4229	0.16	0.37	0	1
Graduate Degree	4229	0.08	0.28	0	1

**Table 2: First Stage Results for Labor Income and Wages**

Variable	IV(1)	IV(1)	IV(1)	IV(1)
	Men	Men	Women	Women
	Labor Income	Wages	Labor Income	Wages
Spouse Prestige	0.265*** (0.066)	0.017*** (0.005)	0.282*** (0.080)	0.042* (0.023)
Non-labor Income	-0.223*** (0.030)	-0.009*** (0.003)	-0.158*** (0.027)	-0.010 (0.009)
Raised Catholic	5.871 (5.336)	-0.469 (0.779)	4.514 (3.446)	-2.076 (2.525)
Raised Protestant	2.819 (4.605)	-0.607 (0.750)	1.880 (2.394)	-2.410 (2.395)
Raised Jewish	27.305*** (9.995)	-0.437 (0.889)	4.355 (5.226)	-2.632 (2.539)
Raised Other	-7.396 (8.832)	-1.340* (0.795)	3.891 (5.351)	-2.449 (2.347)
Raised Fundamentalist	-7.428*** (2.752)	-0.256 (0.243)	-0.349 (1.676)	0.382 (0.317)
Raised Moderate	-8.194** (3.224)	-0.253 (0.312)	1.984 (2.740)	0.390 (0.282)
Constant	-16.445** (8.002)	-0.031 (0.857)	-14.868*** (5.145)	3.213 (4.016)
Observations	1,929	1,929	2,300	2,300
Adjusted R-Squared	0.41	0.18	0.37	0.10
F-Statistic	38.56	23.86	53.28	18.42
Control Variables	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Control Variables include: Not Employed, Age, Age Squared, Lived in Same State as When Aged 16, Married, Widowed, Divorced/Separated, High School Graduate, Associates Degree, Bachelors Degree, Graduate Degree, Black, Other Race, Year Effects, and Region Effects

**Table 3: OLS and Second Stage Results for Attendance and Labor Income**

Variable	OLS	IV(2)	OLS	IV(2)
	Men	Men	Women	Women
	Attendance	Attendance	Attendance	Attendance
Labor Income	-0.0002 (0.001)	0.013 (0.015)	-0.008*** (0.002)	0.013 (0.020)
Non-labor Income	0.001 (0.002)	0.003 (0.003)	-0.003** (0.001)	-0.0001 (0.003)
Raised Catholic	-0.165 (0.342)	-0.237 (0.360)	0.219 (0.337)	0.130 (0.357)
Raised Protestant	-0.219 (0.299)	-0.251 (0.314)	-0.150 (0.291)	-0.184 (0.296)
Raised Jewish	-1.373*** (0.362)	-1.747*** (0.546)	-1.237*** (0.335)	-1.323*** (0.349)
Raised Other	-0.922** (0.409)	-0.804* (0.433)	-0.306 (0.497)	-0.406 (0.540)
Raised Fundamentalist	0.493*** (0.153)	0.599*** (0.192)	0.698*** (0.156)	0.711*** (0.160)
Raised Moderate	0.118 (0.182)	0.230 (0.218)	0.126 (0.188)	0.085 (0.196)
Constant	0.449 (0.596)	0.718 (0.667)	-0.269 (0.571)	0.069 (0.680)
Observations	1,929	1,929	2,300	2,300
Adjusted R-Squared	0.11	0.06	0.09	0.04
F-Statistic	9.33	8.98	8.54	7.53
Instrument F-Statistic		15.92		12.57
Control Variables	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Control Variables include: Not Employed, Age, Age Squared, Lived in Same State as When Aged 16, Married, Widowed, Divorced/Separated, High School Graduate, Associates Degree, Bachelors Degree, Graduate Degree, Black, Other Race, Year Effects, and Region Effects

**Table 4: OLS and Second Stage Results for Prayer and Labor Income**

Variable	OLS	IV(2)	OLS	IV(2)
	Men	Men	Women	Women
	Prayer	Prayer	Prayer	Prayer
Labor Income	-0.019*** (0.005)	-0.032 (0.057)	-0.036*** (0.006)	-0.012 (0.066)
Non-labor Income	-0.007 (0.006)	-0.010 (0.013)	-0.013** (0.005)	-0.010 (0.010)
Raised Catholic	-0.324 (1.312)	-0.258 (1.322)	-0.054 (1.228)	-0.152 (1.252)
Raised Protestant	-0.516 (1.162)	-0.487 (1.157)	0.663 (1.059)	0.626 (1.057)
Raised Jewish	-4.025*** (1.443)	-3.680* (2.098)	-3.016** (1.361)	-3.109** (1.371)
Raised Other	2.200 (2.359)	2.092 (2.422)	-2.529 (1.666)	-2.638 (1.713)
Raised Fundamentalist	2.256*** (0.587)	2.159*** (0.723)	2.651*** (0.548)	2.664*** (0.549)
Raised Moderate	0.548 (0.684)	0.444 (0.808)	1.596** (0.699)	1.551** (0.704)
Constant	-0.928 (2.100)	-1.176 (2.331)	-2.455 (2.075)	-2.085 (2.314)
Observations	1,929	1,929	2,300	2,300
Adjusted R-Squared	0.10	0.10	0.13	0.12
F-Statistic	7.61	7.19	12.59	11.14
Instrument F-Statistic		15.92		12.57
Control Variables	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Control Variables include: Not Employed, Age, Age Squared, Lived in Same State as When Aged 16, Married, Widowed, Divorced/Separated, High School Graduate, Associates Degree, Bachelors Degree, Graduate Degree, Black, Other Race, Year Effects, and Region Effects

**Table 5: OLS and Second Stage Results for Attendance and Wages**

Variable	OLS	IV(2)	OLS	IV(2)
	Men	Men	Women	Women
	Attendance	Attendance	Attendance	Attendance
Wages	-0.011 (0.015)	0.212 (0.232)	-0.025*** (0.008)	0.087 (0.139)
Non-labor Income	0.001 (0.002)	0.002 (0.002)	-0.002 (0.001)	-0.001 (0.002)
Raised Catholic	-0.171 (0.340)	-0.058 (0.424)	0.131 (0.326)	0.370 (0.522)
Raised Protestant	-0.226 (0.297)	-0.084 (0.399)	-0.225 (0.280)	0.051 (0.506)
Raised Jewish	-1.383*** (0.359)	-1.287*** (0.449)	-1.337*** (0.321)	-1.036* (0.544)
Raised Other	-0.935** (0.408)	-0.619 (0.568)	-0.403 (0.502)	-0.141 (0.643)
Raised Fundamentalist	0.492*** (0.153)	0.553*** (0.171)	0.712*** (0.157)	0.673*** (0.163)
Raised Moderate	0.117 (0.182)	0.174 (0.199)	0.120 (0.189)	0.077 (0.193)
Constant	0.450 (0.593)	0.503 (0.636)	-0.062 (0.555)	-0.405 (0.833)
Observations	1,929	1,929	2,300	2,300
Adjusted R-Squared	0.11	0.01	0.08	0.02
F-Statistic	9.31	8.23	8.25	7.68
Instrument F-Statistic		12.68		3.44
Control Variables	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Control Variables include: Not Employed, Age, Age Squared, Lived in Same State as When Aged 16, Married, Widowed, Divorced/Separated, High School Graduate, Associates Degree, Bachelors Degree, Graduate Degree, Black, Other Race, Year Effects, and Region Effects



**Table 6: OLS and Second Stage Results for Prayer and Wages**

Variable	OLS	IV(2)	OLS	IV(2)
	Men	Men	Women	Women
	Prayer	Prayer	Prayer	Prayer
Wages	-0.076 (0.060)	-0.503 (0.911)	-0.111*** (0.026)	-0.083 (0.443)
Non-labor Income	-0.004 (0.006)	-0.008 (0.010)	-0.009* (0.005)	-0.008 (0.006)
Raised Catholic	-0.464 (1.324)	-0.682 (1.522)	-0.440 (1.185)	-0.381 (1.501)
Raised Protestant	-0.610 (1.174)	-0.882 (1.439)	0.334 (1.015)	0.402 (1.475)
Raised Jewish	-4.587*** (1.449)	-4.771*** (1.607)	-3.457*** (1.317)	-3.383* (1.769)
Raised Other	2.259 (2.349)	1.654 (2.767)	-2.955* (1.684)	-2.891 (1.962)
Raised Fundamentalist	2.384*** (0.587)	2.267*** (0.635)	2.710*** (0.554)	2.700*** (0.571)
Raised Moderate	0.687 (0.688)	0.578 (0.725)	1.570** (0.702)	1.559** (0.714)
Constant	-0.566 (2.096)	-0.666 (2.159)	-1.547 (2.018)	-1.632 (2.435)
Observations	1,929	1,929	2,300	2,300
Adjusted R-Squared	0.10	0.07	0.12	0.12
F-Statistic	7.21	7.15	11.79	11.12
Instrument F-Statistic		12.68		3.44
Control Variables	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Control Variables include: Not Employed, Age, Age Squared, Lived in Same State as When Aged 16, Married, Widowed, Divorced/Separated, High School Graduate, Associates Degree, Bachelors Degree, Graduate Degree, Black, Other Race, Year Effects, and Region Effects

**Table 7: OLS Results for Spouse Prestige and Labor Income**

Variable	OLS	OLS	OLS	OLS
	Men	Men	Women	Women
	Attendance	Pray	Attend	Pray
Spouse Prestige	0.004 (0.004)	-0.003 (0.015)	0.006 (0.005)	0.007 (0.019)
Labor Income	-0.0003 (0.001)	-0.019*** (0.005)	-0.008*** (0.002)	-0.036*** (0.006)
Non-labor Income	0.0003 (0.002)	-0.007 (0.006)	-0.004** (0.002)	-0.013** (0.005)
Raised Catholic	-0.155 (0.343)	-0.333 (1.314)	0.226 (0.337)	-0.046 (1.229)
Raised Protestant	-0.212 (0.300)	-0.523 (1.164)	-0.144 (0.291)	0.670 (1.060)
Raised Jewish	-1.370*** (0.361)	-4.028*** (1.443)	-1.229*** (0.336)	-3.007** (1.362)
Raised Other	-0.906** (0.411)	2.186 (2.363)	-0.322 (0.500)	-2.547 (1.670)
Raised Fundamentalist	0.496*** (0.153)	2.253*** (0.587)	0.703*** (0.157)	2.656*** (0.548)
Raised Moderate	0.117 (0.182)	0.549 (0.684)	0.128 (0.189)	1.598** (0.699)
Constant	0.490 (0.597)	-0.966 (2.100)	-0.250 (0.572)	-2.434 (2.076)
Observations	1,929	1,929	2,300	2,300
Adjusted R-Squared	0.11	0.10	0.09	0.13
F-Statistic	9.07	7.39	8.33	12.26
Control Variables	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Control Variables include: Not Employed, Age, Age Squared, Lived in Same State as When Aged 16, Married, Widowed, Divorced/Separated, High School Graduate, Associates Degree, Bachelors Degree, Graduate Degree, Black, Other Race, Year Effects, and Region Effects

Table 8: Results for Spouse Prestige and Wages				
Variable	OLS Men	OLS Men	OLS Women	OLS Women
	Attendance	Prayer	Attendance	Prayer
Spouse Prestige	0.004 (0.004)	-0.007 (0.015)	0.005 (0.005)	0.001 (0.019)
Wages	-0.012 (0.014)	-0.073 (0.060)	-0.026*** (0.008)	-0.111*** (0.026)
Non-labor Income	0.0002 (0.002)	-0.004 (0.006)	-0.002 (0.001)	-0.009 (0.005)
Raised Catholic	-0.163 (0.341)	-0.480 (1.325)	0.135 (0.325)	-0.439 (1.185)
Raised Protestant	-0.220 (0.297)	-0.621 (1.174)	-0.222 (0.279)	0.334 (1.015)
Raised Jewish	-1.385*** (0.357)	-4.583*** (1.446)	-1.334*** (0.321)	-3.456*** (1.317)
Raised Other	-0.920** (0.410)	2.229 (2.354)	-0.418 (0.504)	-2.959* (1.686)
Raised Fundamentalist	0.496*** (0.153)	2.377*** (0.587)	0.716*** (0.157)	2.711*** (0.554)
Raised Moderate	0.117 (0.182)	0.687 (0.688)	0.121 (0.189)	1.570** (0.702)
Constant	0.496 (0.594)	-0.653 (2.096)	-0.042 (0.557)	-1.542 (2.020)
Observations	1,929	1,929	2,300	2,300
Adjusted R-Squared	0.11	0.10	0.08	0.12
F-Statistic	9.06	7.02	8.04	11.46
Control Variables	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Control Variables include: Not Employed, Age, Age Squared, Lived in Same State as When Aged 16, Married, Widowed, Divorced/Separated, High School Graduate, Associates Degree, Bachelors Degree, Graduate Degree, Black, Other Race, Year Effects, and Region Effects