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What Makes People Infidel? An Analysis of the Influence of Demographics on Extramarital Affairs

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Abstract

People in most cultures view sexual fidelity as one of the key foundations of a strong marital relationship. When a person engages in extramarital affairs, irrespective of the length of involvement in such an activity and whether or not the spouse is aware of it, the mutual 'trust' in 'sexual fidelity' takes an intrinsic blow. This paper explores the causes behind extramarital affairs from an economic perspective by statistically testing the hypothesis that the numbers of extramarital affairs people have depend on demographic characteristics of the population.

Keywords

Extramarital affairs; infidelity; demographics

Cover Page Footnote

I sincerely thank Professor Kurt Beron for inspiring in me the love for econometric analysis, and for guiding me with this paper, which I did as part of an assignment in my junior year.

I. Introduction

Marriage is defined as a legal union between two people. Extramarital affairs are romantic or sexual relationships outside of marriage that present both legal and moral problems for the society. Extramarital affairs may or may not ultimately result in a divorce; various studies indicate that the number of dependent children and the level of marital satisfaction before the revelation of extramarital affairs have statistically significant impact on divorce decisions (Fan, 2004). In the face of our elected representatives like Governor Mark Sanford of South Carolina and Senator John Ensign of Nevada going public with the fact that they are having affairs, a Gallup poll conducted in 2009 revealed that 92 percent Americans concur that having an extramarital affair is morally wrong--- making this the most objectionable and morally intolerable of any issue previously tested (Newport, 2009).

Looking at this issue from the perspective of 'emotional well-being' and 'happiness,' according to Freedman (1978), the happier one is with love, marriage and sex, the more likely that person is to achieve overall happiness in life. Thus, extramarital affairs can prove to be a major impediment to achieving happiness in households. If the probable causes of extramarital affairs can be identified, then it may become easier to take actions to deter such conduct of infidelity.

This paper statistically tests the hypothesis that the number of affairs people have depend on demographic characteristics of the population such as gender, age, education, occupation, years married, number of children, satisfaction with married life and degree of religiousness.

II. Review of Previous Literature

Due to lack of reliable data and the tendency of researchers to approach this topic from a psychological or behavioural viewpoint, economic studies on what factors influence the number of extramarital affairs people have are very limited. A survey as early as 1978 found that 27.2 percent of first-time married working men and 22.9 percent of first-time married working women were engaged in extramarital affairs at the time of the study (Fair, 1978). Fair proposed a utility model that allocated a person's time among three activities- work, with spouse and for paramour. However, this model did not take into account the social class or the race of the sample population.

Chernozhukov and Hong (2002) used a three step Censored Quantile Regression model to contrast their findings to those of Fair. Elmslie, Bruce and Tebaldi (2008) developed an expected utility model that analysed how cheating habits differ between men and women. It identified social class and spouse's educational attainment as the chief factors affecting women's behaviour towards infidelity (Elmslie 2008, 406). Groot, Wim and Brink (2002) found that for both men and women, satisfaction with marriage and life in general will increase as household income increases, and women are more satisfied when there is an education gap with their spouse (Groot, 2002). Liu (2008) used a stochastic optimization model to explain why despite the presence of punishments and deterrents, extramarital affairs are a common occurrence. Further study will enable us to elucidate if more distinct patterns exist between demographics and extramarital affairs.

III. Specification of the Model

The model uses multivariate analysis to determine if demographic characteristics of the sample population influence the number of affairs people have. Here, 'number of affairs' is used as the dependent variable, while gender, age, years married, number of kids, religiousness, education, occupation and marital satisfaction are used as the control variables.

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \beta_7 x_7 + \beta_8 x_8 + e$$

In this model, 'y' is the 'number of affairs within the last year', β_0 is a constant, x_1 is a binary variable that denotes gender and assumes the value of 1 if the person is male, x_2 is the age in years, x_3 is the number of years married, x_4 is the number of kids in the family, x_5 is the degree of religiousness (which is a binary variable that assumes the value of 1 if the person is 'slightly religious' or 'unreligious,' and a value of 0 if the person is 'very religious' or 'somewhat religious'), x_6 denotes the number of years of schooling, x_7 is occupation in reverse Hollingshead scale and x_8 is satisfaction with married life (which is a binary variable that assumes the value of 1 if the person is 'somewhat unhappy' or if 'very unhappy' and a value of 0 if the person is 'very happy,' 'happier than average' or 'averagely happy'). The fact that occupations are ranked in reverse Hollingshead scale implies that the most prestigious occupations like executives and top professionals are ranked at 7, and the scale progressively decreases with the unemployed and unskilled workers ranked at 1.

The coefficient β_1 can be either positive or negative if we start out with the belief that both men and women are equally likely to be promiscuous, and β_2 would be anticipated to be negative as people are more sexually active in their youth, and their sexual desires probably decrease with increase in age. It is to be expected that β_3 would be positive as monotonicity and boredom increase the longer one has been married; β_4 can be expected to be negative because having more kids will require greater amount of time spent in child-care and in looking after family, limiting the time available for paramour; β_5 would be expected to be positive because if the person is 'not religious,' then he is likely to have less scruples about having affairs; β_6 and β_7 will be expected to be negative, as it is intuitive that higher education and more prestigious occupation will decrease the number of affairs people have; and β_8 should be positive because probability of having an affair would increase if one is unhappy with married life. Religion and education impart morality to people, making them more conscientious about having an affair. The error term 'e' is expected to be a random variable with constant variance across observations (homoskedasticity). However, this may or may not be true.

IV. Data Description

The data, originally collected through a survey by *Psychology Today* and now hosted on Dr. R.C. Fair's website at Yale University Department of Economics, was obtained through the University of Texas at Dallas' E-learning website. Professor Fair discusses the characteristics and limitations of the data in *A Theory of Extramarital Affairs* (Fair 1978, 52):

> "The first survey was conducted in 1969 by *Psychology Today* (PT). A questionnaire on sex was published in the July 1969 issue of PT and the readers were asked to mail in their answers. About 20,000 replies were received; of which about 2000 were coded onto tape…The questionnaires included questions about extramarital affairs as well as about many other aspects of sexual behavior and about various demographic and economic characteristics of the individual… The discussions of the answers to the PT survey can be found in the July 1970 issue of PT…The size of the usable sample from the PT tape was 601 observations."

As Dr. Fair acknowledges in *A Theory of Extramarital Affairs*, the main problem with this sample is the possibility of bias because the data collected was not a random sample of the American population; rather it included only the

readers of *Psychology Today* within a particular geographical area. Further, the possibility of omitted variable bias in the estimation of the model cannot be ruled out, as the data does not include some key demographic factors such as actual income, size of household (nuclear/ joint family), residential location (urban/ rural), etc. which could have an impact on the dependent variable if the information was available.

An appraisal of the sample summary reveals that the mean age of the sample population is 32.49 years (Figure 1) with an average married life of 8.18 years (Figure 2), average 16.2 years of education (Figure 3) and mean rank of occupation on Hollingshead scale 4.2 out of 7 (Figure 4), indicating a fairly young well-educated group of skilled workers who have been in a married relationship for a little less than a decade. The average number of extramarital affairs within the last year is 1.5, but the range is rather large- the minimum being 0 and the maximum being 12, with a standard deviation of 3.3 (Figure 5). The mean rating of married life was 3.9 implying that in general the sample population thought their married life was happier than average (Figure 6) and the mean degree of religiousness was 3.1 indicating that the sample on the whole was only 'slightly religious (Figure 7).

V. Results

The original model produced the following output, with a very small coefficient of determination of 0.1480.

$$\begin{aligned} naffairs &= 0.619 + 0.178male - 0.053age + 0.180yrsmarr - 0.136kids + 1.152notrelig - 0.021educ \\ (se) \quad & (1.022) \quad (0.298) \quad (0.022) \quad (0.041) \quad (0.346) \quad (0.261) \quad (0.063) \\ & + 0.107occup + 2.495nothap \\ & (0.088) \quad (0.375) \end{aligned} \tag{1}$$

A Jarque- Bera (JB) test for evidence of normal distribution of residuals revealed a JB p-value of 6.80e-148, leading to the rejection of the null hypothesis of normal distribution (Figure 8). Furthermore, the White test yielded a very high chi-squared value of 102.38 and a p-value of 0 up to the 4th decimal place, leading to the rejection of the null hypothesis of homoskedasticity.

Since the original model proved to be heteroskedastic, the standard errors needed to be adjusted by using robust standard errors.

$$naffairs = 0.619 + 0.178male - 0.053age + 0.180yrsmarr - 0.136kids + 1.152notrelig - 0.021educ$$

(se) ***(1.110)*** ***(0.288)*** ***(0.025)*** ***(0.044)*** ***(0.362)*** ***(0.251)*** ***(0.067)***
+ 0.107occup + 2.495nothap
(0.084) ***(0.539)*** (2)

From the p-values and t-statistics, it can be concluded that the coefficients of *age*, *yrsmarr*, *notrelig* and *nothap* are significant at the 95 percent confidence level. From the regression, it is also apparent that at the 5 percent significance level, the p-values for *male* (0.538), *kids* (0.708), *educ* (0.758) and *occup* (0.205) are very high, indicating insignificance. One concern is that value of R-squared is very small (0.1480), indicating that the relationship between the dependent variable and the independent variables is very low. After running multiple auxiliary regressions, no evidence of collinearity was found.

One question is whether *male, kids, educ* and *occup* are irrelevant variables. Upon using the Ramsey RESET test, the joint test statistic yielded a very small p-value (0.0005) leading to the rejection of the null hypothesis that the functional form of the model is adequate. So there arose the need to find a better functional form. Following up, an F-test for the overall significance of the model yielded a very small p-value of 0, indicating that the overall model is significant; implying that despite the small R-squared value, at least some of the independent variables have probable relations with the dependent variable, and must not be neglected from the study. In this test,

Unrestricted regression: $\boldsymbol{y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \beta_7 x_7 + \beta_8 x_8 + e}$

Restricted regression: $\boldsymbol{y = \beta_0}$

Another joint hypothesis test was run using null hypothesis $\boldsymbol{H_0: \beta_1 = \beta_4 = \beta_6 = \beta_7 = 0}$ and the alternative $\boldsymbol{H_1: otherwise.}$ The unrestricted and restricted models were set up accordingly. This time the p-value of the joint test was 4.217e-19 leading to rejection the null hypothesis that *male*, *kids*, *educ* and *occup* are irrelevant variables. Thus, *male*, *kids*, *educ* and *occup* will be retained in the analysis because previous literature provides strong support for their inclusion.

The variables *age* and *educ* appeared to behave in a quadratic manner. On predicting the values for number of affairs, and graphing predicted values on x-axis and age^2 on y-axis, resulted in a concave down parabola (Figure 9). In this regression, the *yrsmarr* variable was omitted due to high degree of correlation with both *age* (0.7775) and age^2 (0.7279). The 'maximum age' here for affairs was about 40.17 years (using decimals up to 7 places as shown in Appendix A Table IV).

$$naffairs = -4.472 + 0.283\ age - 0.004\ age^2$$
$$(se) \quad (2.034) \quad (0.114) \quad (0.001) \qquad (3)$$

For the quadratic model using age, coefficients of *age*, age^2, *nothap*, *notrelig* and the constant term were significant at the 95% confidence level.

Using the same prediction methods as before and $educ^2$ on the y-axis resulted in a concave up parabola (Figure 10).

$$naffairs = 6.493 - 0.770\ educ + 0.024 educ^2$$
$$(se) \quad (5.827) \quad (0.715) \quad (0.022) \qquad (4)$$

For the quadratic model using years of education, coefficients of *yrsmarr*, *notrelig* and *nothap* were significant at the 95% confidence level. The minimum number of years of education here for affairs comes to approximately 16.16 years (using decimals up to 7 places as shown in Appendix A Table IV).

The log-linear model using robust standard errors yielded insignificant coefficients for *male*, *age*, *kids*, *educ* and *occup;* and the results of this model were not used in the analysis.

The nature of the data called for the use of models with interaction of dummy variables with continuous variables. First, two new variables, *yrsmale* = *yrsmarr*male* and *nothapmale* = *nothap*male,* were generated and then the regression was run.

$$naffairs = 0.713 + 0.176 yrsmarr + 0.009 yrsmale + 2.291 nothap + 0.463 nothapmale$$
$$(se) \quad (1.147) \quad (0.049) \quad (0.045) \quad (0.714) \quad (1.080) \qquad (5)$$

This time, the coefficients for *yrsmarr*, *nothap, notrelig* and *age* were significant, while the others were insignificant at the 95% confidence level.

VI. Discussion

From the results, it is evident that the satisfaction with marriage has the greatest impact on the number of extramarital affairs. A look at the elasticities of variables (Appendix A) reveals that a 1 percent increase in marital dissatisfaction (*nothap*) increases the number of affairs by 0.23 percent. This certainly corresponds to our intuition that the unhappier one is with marriage, the more likely he is to engage in infidelity. Degree of religiousness and age are also inversely related to number of affairs. A 1 percent decrease in religiousness

increases number of affairs by 0.45 percent; and a 1 percent increase in age the decreases the number of affairs by 1.14 percent. This is also in alignment with our intuition that if one is more pious, he is less likely to be infidel because of moral scruples; and as one advances in age, he is less likely to be infidel due to decrease in sexual urges. Qi and Racine (2004) applied a non-parametric model to Fair's data set and observed that the relationship between age and number of affairs is nonlinear, being flat and/or upward sloping for younger ages, and exhibiting a downward trend for people over 40. The number of years married also has a significant positive impact on infidelity, confirming our intuition that boredom and urge for paramour may increase the longer one has been married.

The biggest surprise was the sign of the coefficient of occupation. Although the coefficient itself proved insignificant, the positive sign indicated that if one was employed in a higher-ranked job, he was likely to have more affairs. This is in violation of our intuition that more prestigious jobs would cause one to be more faithful because his reputation will be at stake. Perhaps here, a comparison with the actual income of the household would be significant, if such data were available. This is because the rankings on occupations on the reverse Hollingshead scale do not necessarily translate into corresponding high-income generating jobs. Another factor to take into consideration would be the extent of segregation of men and women in their relevant occupations. McKinnish (2007) found that if men and women who work more together than in 'segregated occupations,' they were more likely to be divorced as the workplace becomes an important venue for extra-marital search.

The negative coefficient for education in the quadratic model confirms that as years of schooling increase, one is less likely to be infidel. However, beyond about 18 years of schooling, the number of affairs shows a slight increasing trend. The positive sign for the coefficient of *male* (although the coefficient itself is insignificant) suggests a possible relationship of gender with infidelity. However, more relevant data is required to confirm such indications.

VII. Conclusion

The most important problem with the data is that it is somewhat dated, and omits some important variables like race, location and income. Collected as early as 1978, it is no longer reflective of the current characteristics of the American population. For example, recent studies show that there has been a rapid aging of the American population since 1950s, which is reflected by a larger proportion of

persons aged 65 and older, as well as by an increasing median age in the population. Moreover, an increased trend in immigration since 1980 has made United States more ethnically diverse. The net immigration rate, which fluctuated in the low range of 1.5 to 2.4 net migrants per 1,000 resident population between 1950 and 1979, has been on the rise since 1980, and the annual rates in the 1990s were generally in the range of 3.0 to 3.9 (Shrestha and Heisler, 2011).

Yet, the results from the analysis of this data give important indications of the relationship of various demographic variables with the likelihood of infidelity. It allows us to engage in a more comprehensive economic analysis of a topic that had been previously approached only from psychological or behavioral perspectives.

Many of findings in this analysis are consistent with those from a slightly different but related survey in 1994, which asked participants whether they had engaged in extramarital sex. This survey had found more significant links between gender and infidelity. The report said:

> "Although extramarital sex was related to age, the effect differed for men and women. In just considering respondents under age 40, near-equal percentages of men (14%) and women (13%) reported having engaged in it. For men, however, the likelihood generally increased with age to the point where 34% of men ages 60-69 reported having engaged in extramarital sex. For women, the incidence peaked in the 40-49-year-old group (19%) and steadily decreased thereafter (Wiederman, 1999)."

The general conclusion from this study is that more religiousness, higher marital satisfaction and increase in age make people less likely to be infidel; while increase in years married raises chances of infidelity. Further studies are necessary, preferably with a more recent data set, to make conclusive inferences about the impact of other demographic variables on extramarital affairs and infidelity, and on whether results can change significantly depending on the origins of the sample.

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Appendix A

I. Variable Names and Description

Variable Name	Description
id	identifier
male	=1 if male
age	In years
yrsmarr	Year married
kids	=1 if have kids
relig	5= very religious, 4= somewhat, 3= slightly, 2= not at all, 1= anti-religious
educ	Years of schooling
occup	Occupation, reverse Hollingshead scale
ratemarr	5= very happy marriage, 4= happier than average, 3= average, 2= somewhat unhappy, 1= very unhappy
naffairs	Number of affairs within last year
affair	=1 if had at least one affair
vryhap	ratemarr==5
hapavg	ratemarr==4
avgmarr	ratemarr==3
unhap	ratemarr==2
nothap	Ratemarr==1 or ratemarr==2
vryrel	relig==5
smerel	relig==4
slghtrel	relig==3
unrel	relig==2
notrelig	relig<=3

II. Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
id	601	1059.722	914.9046	4	9029
male	601	.4758735	.4998336	0	1
age	601	32.48752	9.288762	17.5	57
yrsmarr	601	8.177696	5.571303	.125	15
kids	601	.7154742	.4515641	0	1
relig	601	3.116473	1.167509	1	5
educ	601	16.16639	2.402555	9	20
occup	601	4.194676	1.819443	1	7
ratemarr	601	3.93178	1.103179	1	5
naffairs	601	1.455907	3.298758	0	12
affair	601	.249584	.4331328	0	1
vryhap	601	.3860233	.4872415	0	1
hapavg	601	.3227953	.4679347	0	1
avgmarr	601	.1547421	.3619599	0	1
unhap	601	.109817	.3129219	0	1
nothap	601	.1364393	.3435403	0	1
vryrel	601	.1164725	.3210579	0	1
smerel	601	.3161398	.4653555	0	1
slghtrel	601	.2146423	.4109159	0	1
unrel	601	.2728785	.44581	0	1
notrelig	601	.5673877	.4958508	0	1

III. Elasticities of Variables after Regression using Robust Standard Errors

```
Elasticities after regress
      y  = Fitted values (predict)
         =  1.4559068
```

variable	ey/ex	Std. Err.	z	P>|z|	[95% C.I.]		X
male	.0580482	.09431	0.62	0.538	−.126799	.242896	.475874
age	−1.191875	.56163	−2.12	0.034	−2.29265	−.091104	32.4875
yrsmarr	1.012613	.2433	4.16	0.000	.535756	1.48947	8.1777
kids	−.0666596	.17813	−0.37	0.708	−.415789	.28247	.715474
notrelig	.4488465	.09044	4.96	0.000	.271593	.6261	.567388
educ	−.2283658	.74015	−0.31	0.758	−1.67904	1.22231	16.1664
occup	.308175	.24089	1.28	0.201	−.163954	.780304	4.19468
nothap	.2337904	.04822	4.85	0.000	.139286	.328295	.136439

IV. Regression Analysis of the Effect of Demographics on Number the Number of Extramarital Affairs

Dependent Variable:	#Extramarital Affairs				
Regressor	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
male	.1775951 (.2981169)	.1775951 (.2879739)	−.0675263 (.2833058)	.1038229 (.3005161)	.0459096 (.36844)
age	−.0534131 (.0224092)	−.0534131 (.0249448)	.2831212** (.1139545)	−.0559215** (.0254589)	−.0540193** (.0252254)
yrsmarr	.1802795*** (.0407141)	.1802795*** (.0442156)		.1781241*** (.0443057)	.1764316*** .04869
kids	−.1356445 (.3464703)	−.1356445 (.3624536)	.2230143 (.3757033)	−.1382407 (.3650557)	−.1172599 (.3651821)
notrelig	1.151732*** (.2607795)	1.151732*** (.250514)	1.050799*** (.2449012)	1.178764*** (.2536096)	1.142631*** (.2494358)
educ	−.0205661 (.0633375)	−.0205661 (.066819)	−.0507342 (.0679404)	−.769848 (.714848)	−.0214075 (.0672482)
occup	.1069628 (.0880293)	.1069628 (.0843441)	.1194674 (.084926)	.1081033 (.0840404)	.1044439 (.0845991)
nothap	2.494715*** (.3747153)	2.494715*** (.5389366)	2.550965*** (.548019)	2.454117 (.538164)	2.290707*** (.7144596)
age2			−.0035239** (.0014626)		
educ2				.0238122 (.022163)	
yrsmale					.0092198 (.0446389)
nothapmale					.4631514 (1.080043)
R-squared	0.1480	0.1480	0.1303	0.1506	0.1487

***: Significant at 99 percent confidence level
**: Significant at 95 percent confidence level
*: Significant at 90 percent confidence level

Appendix B

Figure 1

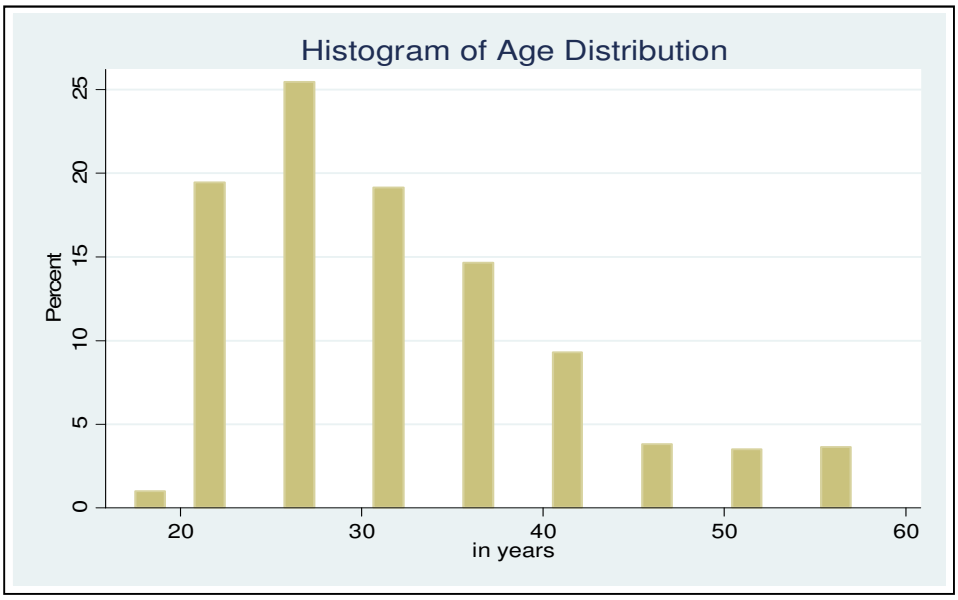

Figure 2

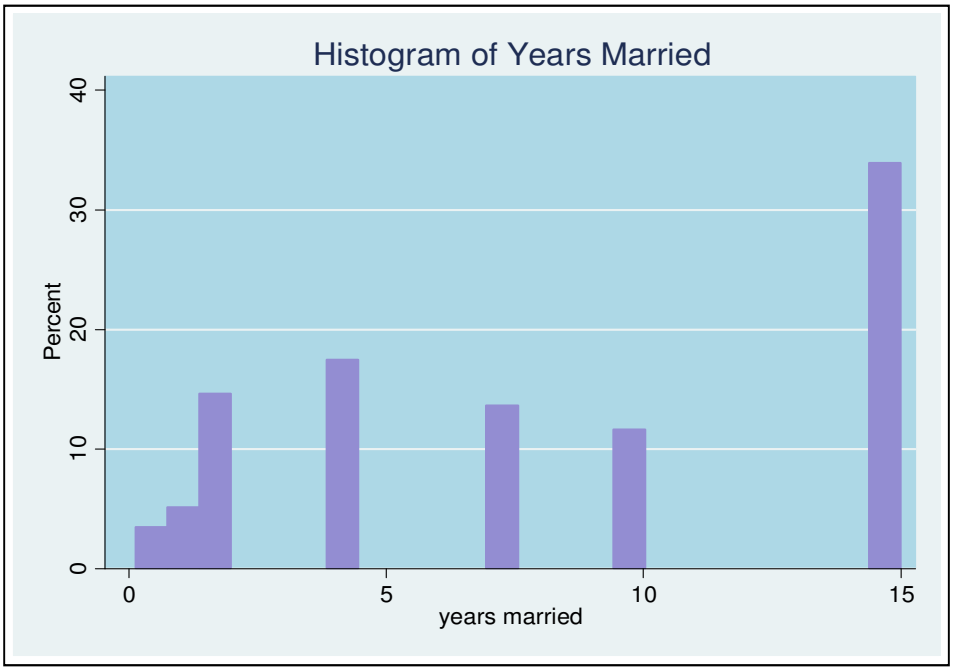

Figure 3

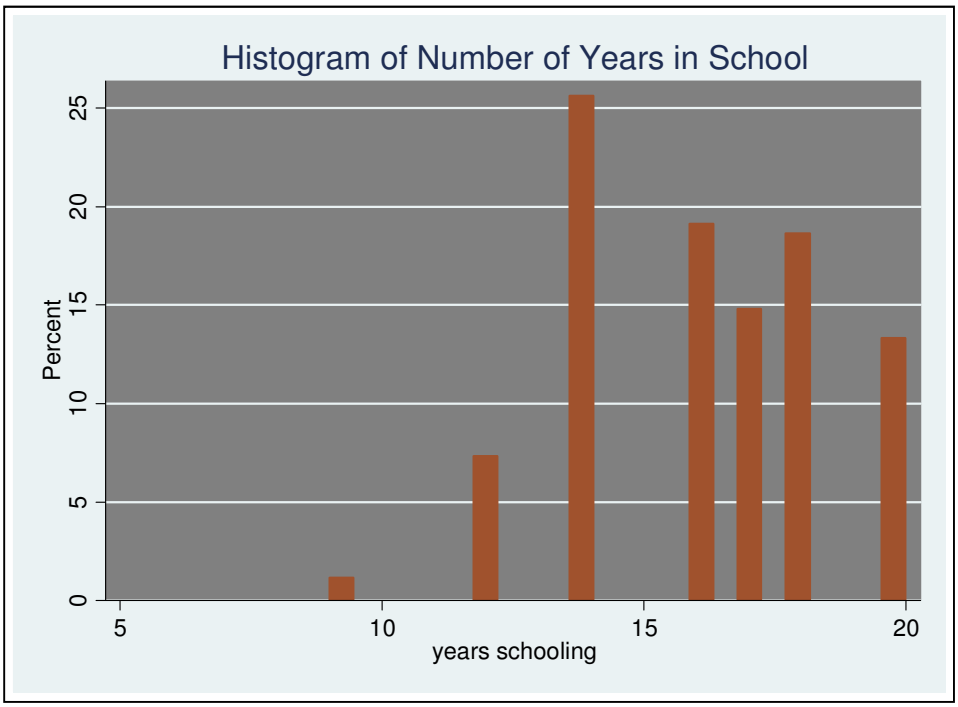

Figure 4

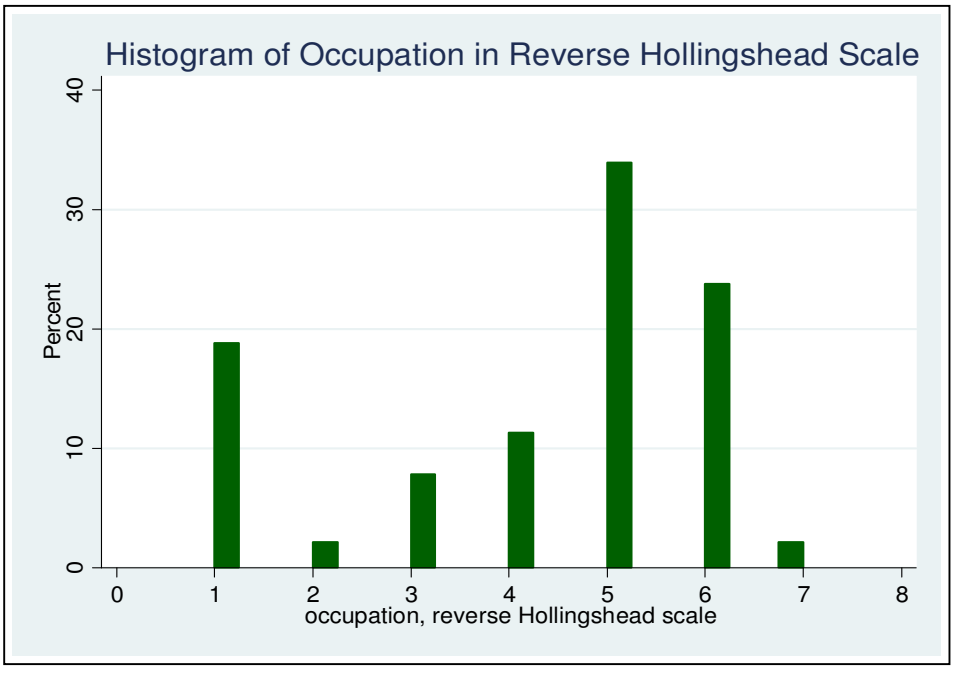

Figure 5

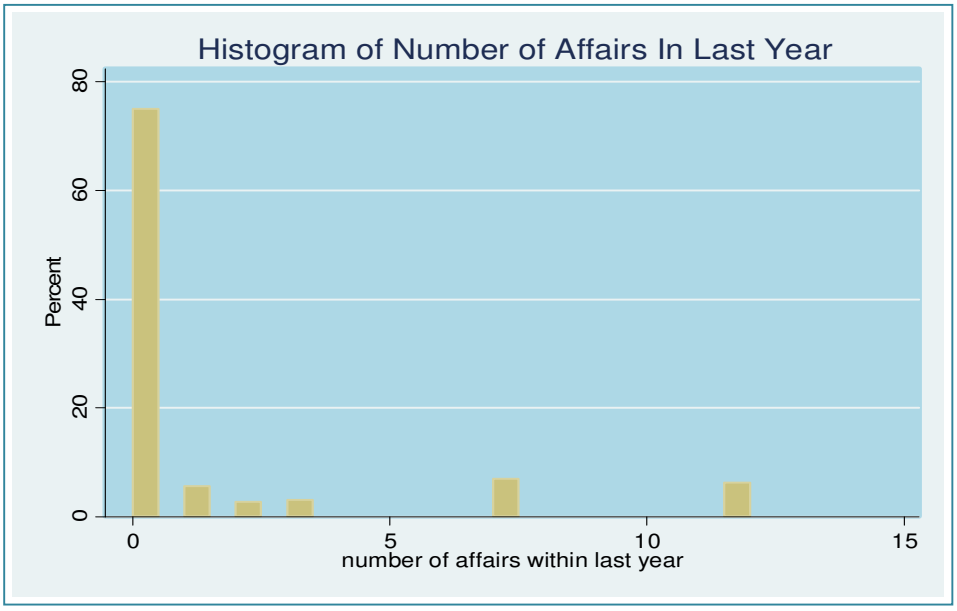

Figure 6

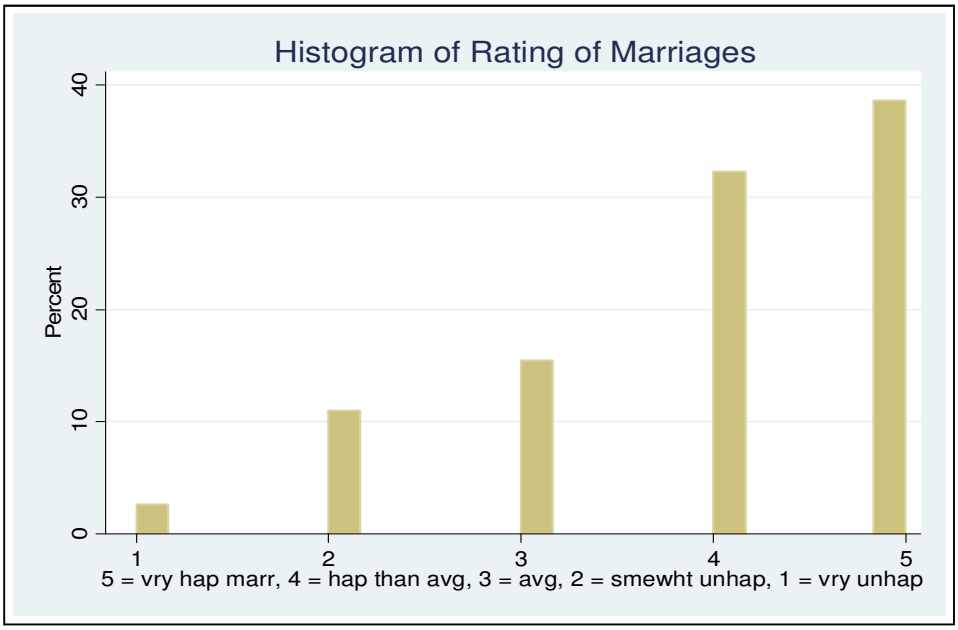

Figure 7

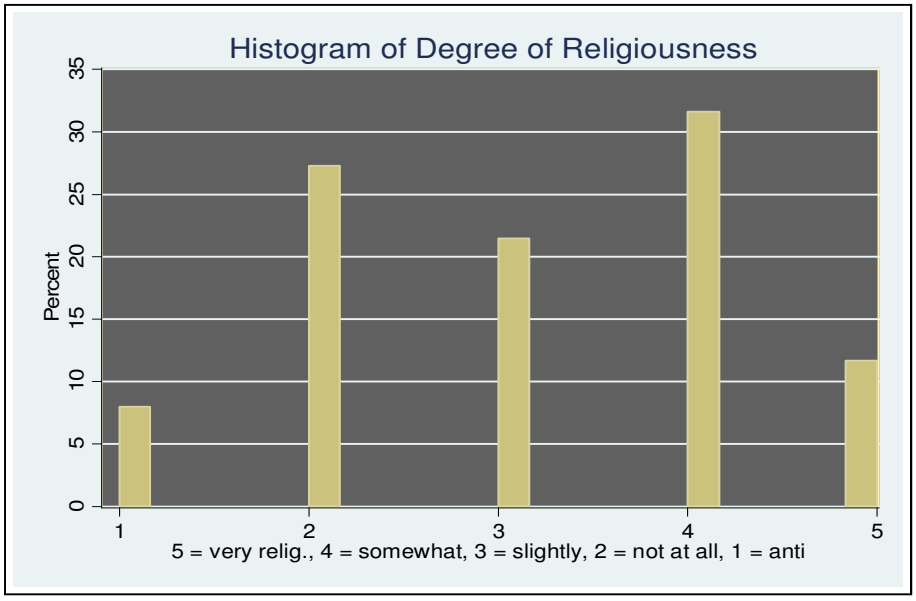

Figure 8

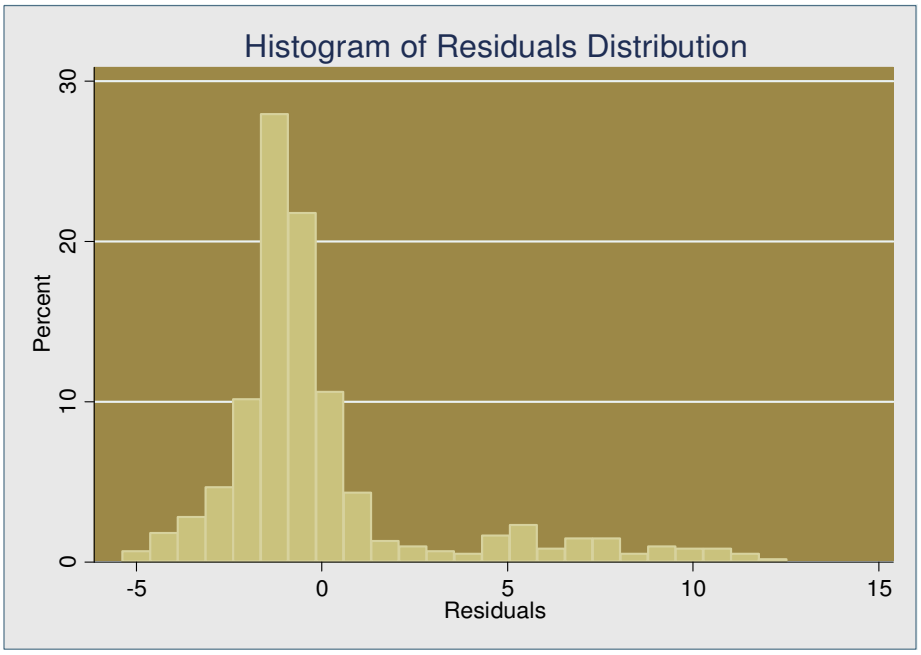

Figure 9

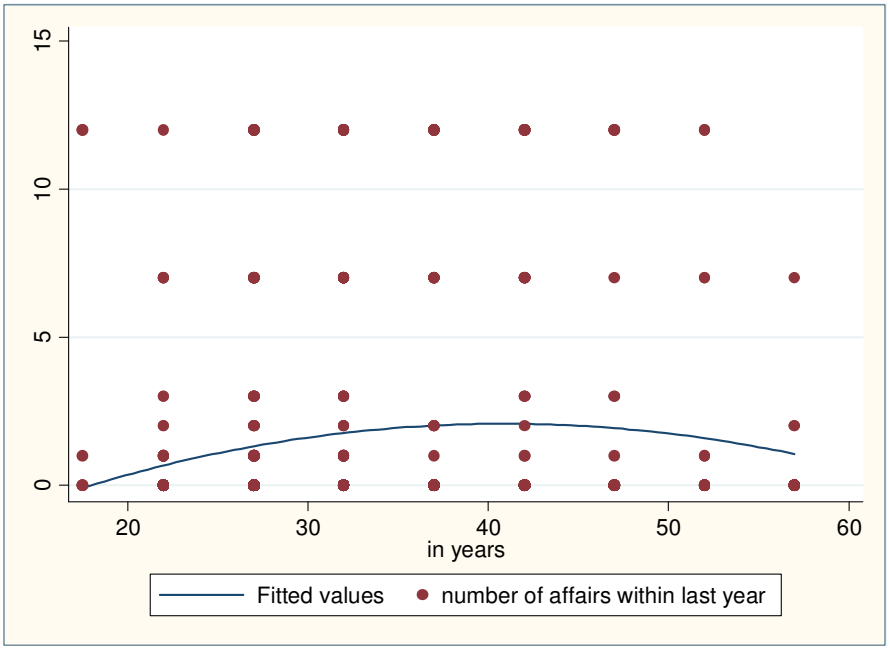

Figure 10