Assignment 2: Interpreting Quantitative Findings

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Contents

1 Introduction

In 1998, the Good Friday/Belfast Agreement was signed and later validated by the voters, and this agreement marked a new era of hope towards peace, equality, and inclusion in Northern Ireland (Galligan 2013). The main focus on the agreement and referendum was obviously to stop the violent conflict and seek peace, but one part of the agreement also emphasized an equality agenda (Hayward 2021). Thus, the agreement also marked the first Northern Irish formal recognition of women's rights to political inclusion (Galligan 2013). However, a formal recognition does not necessarily imply that gender equality trickles down into social norms and practices. Therefore, this report examines the contemporary state of women's equality in Northern Ireland.

Perhaps, the most central concept within gender equality is the *gender pay gap*. Disparities in income is an important indicator for gender equality, because it has social, economic, and physiological consequences (Bishu and Alkadry 2017). Research on this area have identified several factors that seems to influence a gender pay gap. One such factor can be inequality in access to workplace authority, where women are denied manager or supervisor position although there were equally qualified (Bishu and Alkadry 2017). Other factors can be discrimination in hiring or promotion processes, but also lack of gender representation can avoid minorities to even apply for a job or promotion (Bishu and Alkadry 2017).

In order to examine the current gender equality in Northern Ireland, we therefore focus on the gender pay gap in Northern Ireland. We ask the following research question: *Does gender affect income in contemporary Northern Ireland?* We employ a deductive approach, where we first formulate a hypothesis and subsequently examine it empirically (Bryman 2016, 33). Therefore, our analysis consider the following null hypothesis (H_0) and alternative hypothesis (H_A):

- H_0: Being a woman or man does not affect your income.
- H_A: Being a woman rather than a man affects a lower income.

The causal relationship that we examine is thus a negative relationship. Although, we call this relationship causal, it is important to clarify that I do not imply that there is anything biological or deterministic that reduce women's income in general. Rather, the causal link is interpreted as a result of the societal discriminatory practices explained in the previous paragraph. To make a convincing inquiry of this causal relationship, we must also control for a number of other factor related to income and gender. This is important to make sure that our analysis do not simply show a spurious correlation as it could in fact be another factor that influences both gender and income. These control variables are introduced in the Data and Methods-section.

2 Data and method

The research design of this analysis is a cross-sectional design (Bryman 2016, 53). This means that the data for analysis is collected at a single point in time and consists of a sample of respondents from which we seek to infer to a general population of Northern Ireland (Field, Miles, and Field 2012, 36). This section describes this sample and how the data was collected, and then subsequently the operationalized variables to examine our research hypothesis are described.

2.1 Sample and Data Collection

Our sample for the analysis consists of data from Northern Ireland Life and Times Survey (NILT). The data have been collected every year since 1998, but this analysis uses the survey from 2012 (ARK 2012). The respondents for the NILT survey was chosen from a systematic random sample of addresses. From this sample of 2126 addresses, 1204 questionnaires were fully completed using partly face-to-face- and self-completion questionnaires (ARK 2012). Our sample of analysis is further reduced as not all respondents have answered

our variables of interest, and we are therefore not able to include those respondents in our analysis. In the tables below, we present descriptive statistics for our variables of interest in both the full NILT sample and our sample of analysis. The first tables shows the categorical variables, where a frequency distribution are shown (Fogarty 2018, 88). The second table shows the numerical variables, where we have calculated the mean and standard deviation (Fogarty 2018, 95).

Table 1: Descriptive Statistics for Cleaned and Full Sample (Categorical Variables)

	Cleaned Sample		Full Sample		
Variable	N	Percent	N	Percent	Test
Sex	675		1204		X2=1.022
... Male	284	42.1%	537	44.6%	
... Female	391	57.9%	667	55.4%	
Religion	675		1168		X2=0.849
... Catholic	277	41%	491	42%	
... Protestant	283	41.9%	497	42.6%	
... No religion	115	17%	180	15.4%	
Sexual Orientation	675		1191		X2=3.039
... I am heterosexual or straight	657	97.3%	1173	98.5%	
... I am gay or lesbian (homosexual)	14	2.1%	14	1.2%	
... I am bi-sexual	2	0.3%	2	0.2%	
... Other	2	0.3%	2	0.2%	
Constitutional View	675		1183		X2=0.347
... Unionist	199	29.5%	348	29.4%	
... Nationalist	138	20.4%	255	21.6%	
... Neither	338	50.1%	580	49%	
Trade union membership	675		1179		X2=9.162***
... Yes	301	44.6%	440	37.3%	
... No	374	55.4%	739	62.7%	
Supervisor: No	675		883		X2=0.143
... Yes	211	31.3%	267	30.2%	
... No	464	68.7%	616	69.8%	

Note:

Statistical significance markers: * p<0.1; ** p<0.05; *** p<0.01

Table 2: Descriptive Statistics for Cleaned and Full Sample (Numerical Variables)

	Cleaned Sample			Full Sample			
Variable	N	Mean	SD	N	Mean	SD	Test
Annual Personal Income (GBP)	675	16892.089	13447.704	897	16394.582	13465.9	F=0.526
Age	675	46.763	17.117	1201	49.615	18.53	F=10.81***

Note:

Statistical significance markers: * p<0.1; ** p<0.05; *** p<0.01

In the table with categorical variables, we conduct a Chi-squared test to check if there is independence between the samples or not, i.e. whether the frequency distribution is significantly different (Fogarty 2018, 176). For the numerical variables, we conduct an Analysis of Variances (ANOVA) to test whether the means in the two samples are significantly different (Field, Miles, and Field 2012, 399ff). For the categorical

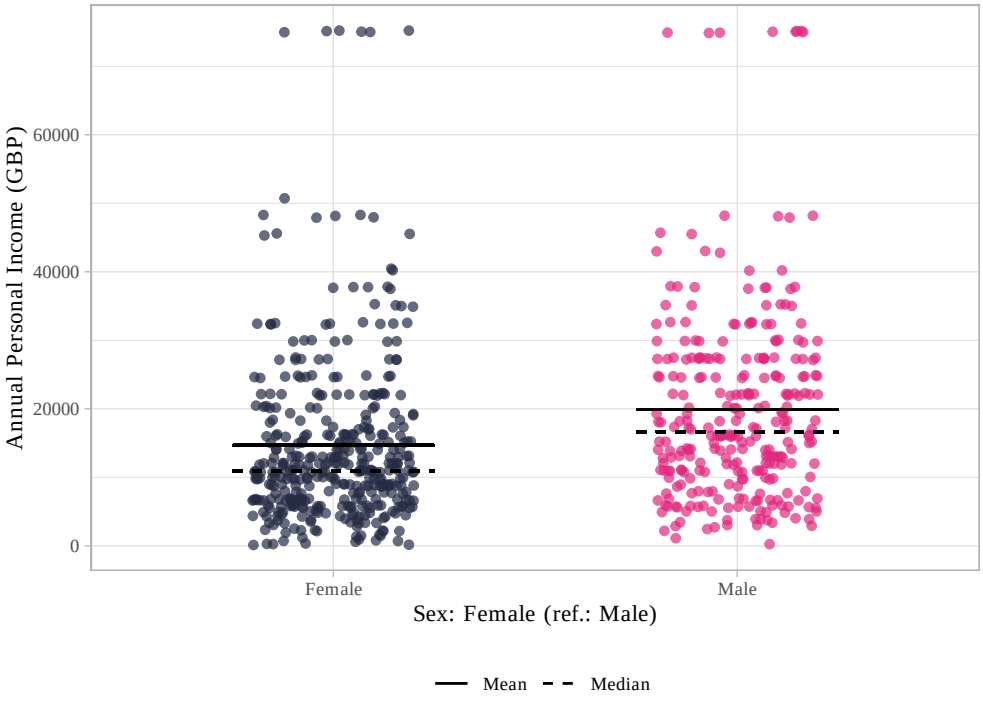
variables, we see that for the test of trade union membership, the test value is 9.162, which is significantly different from 0 (with a p-value less than 0.01). This indicates that the frequency distribution in our sample is significantly different from the full NILT sample. There is a larger share (44.6 %) of members of a trade union after removing missing values compared to only 37.3 % in the full NILT sample. Similarly, we see from the ANOVA that the test value (F) for age is significantly different from 0 (with a p-value less than 0.01) meaning that our sample is different from the full NILT sample in the age distribution. We can see that the mean age is only around 46 years compared to 49 years in the full NILT sample. These two findings are important to bear in mind, when we interpret our final conclusion as both age and trade union membership might be related to our dependent variable, income.

The systematic random sampling strategy in the NILT survey is an approach to make the sample representative of our population - in our case all inhabitants of Northern Ireland. It could be relevant to examine the demographic distribution in our sample against the general population of Northern Ireland, but unfortunately that is beyond the scope of this report.

2.2 Dependent, Independent, and Control Variables

Levels of measurement: nominal, ordinal, interval, and ratio (Fogarty 2018, 56)

Figure 1: Scatterplot of Income and Sex



Note:
The points are jittered on the x-axis for the purpose of visualization.
There are only two categories for this question.

To fully examine the relationship between our dependent and independent variable, we employ a multiple linear regression estimated with OLS [fogarty2018quantitative 192ff]. Thus, we are also able to include the control variables to make the acceptance or decline of our hypothesis more convincing.

3 Results and discussion

Here comes the regression.

Table 3: Regression results

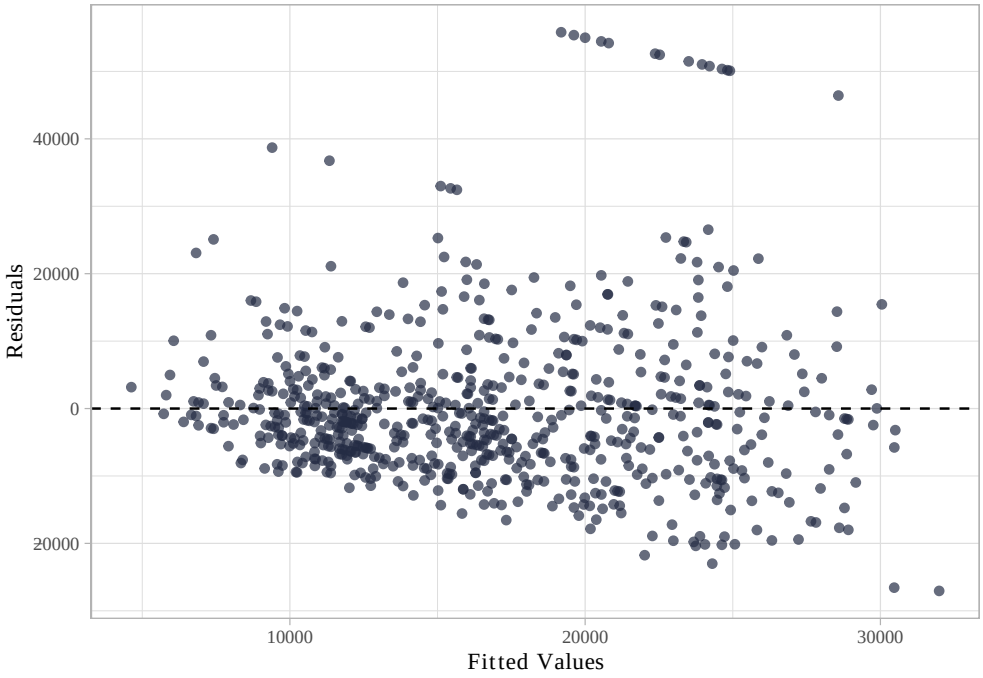
	Dependent Variable
	Annual Personal Income (GBP)
Sex: Female (ref.: Male)	−5,068.737***
	(994.748)
Religion: Protestant (ref.: Catholic)	465.188
	(1,458.367)
Religion: No religion	895.169
	(1,533.323)
Sexual Orientation: Homosexual (ref.: Heterosexual)	−6,247.777*
	(3,437.048)
Sexual Orientation: bi-sexual	−2,826.980
	(8,698.806)
Sexual Orientation: Other	1,323.336
	(8,737.282)
Constitutional View: Nationalist (ref.: Unionist)	1,788.873
	(1,898.294)
Constitutional view: Neither	1,438.036
	(1,350.423)
Trade union membership: No (ref.: Yes)	−5,277.978***
	(977.008)
Supervisor: No (ref.: Yes)	−8,648.320***
	(1,037.559)
Age	−84.369***
	(29.430)
Constant	31,343.540***
	(2,488.067)
Observations	675
R^2	0.183
Adjusted R^2	0.170
Residual Std. Error	12,252.840 (df = 663)
F Statistic	13.533*** (df = 11; 663)
Note:	*p<0.1; **p<0.05; ***p<0.01

Effect sizes (Field, Miles, and Field 2012, 57) Influential data points / outliers (Fogarty 2018, 221–22)

3.1 Check for Heteroscedasticity

Here comes a check for heteroscedasticity.

Figure 2: Scatterplot of Fitted Values and Residuals



Method	Statistic	P-value	Parameter
Breusch-Pagan test	133.494	0	11

3.2 Reliability and Validity

Reliability and validity (Bryman 2016, 41) Internal and external validity (Bryman 2016, 41–42)

4 Conclusion

5 References

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6 Appendix

Figure 3: Barplot of Sex

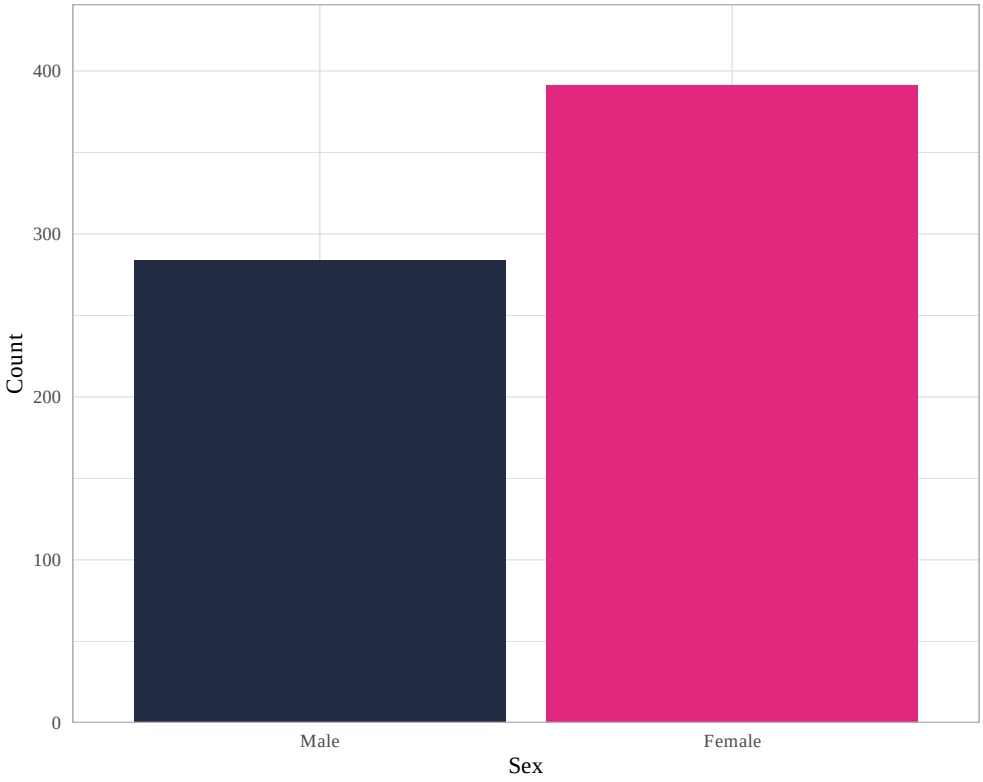

Figure 4: Barplot of Religion

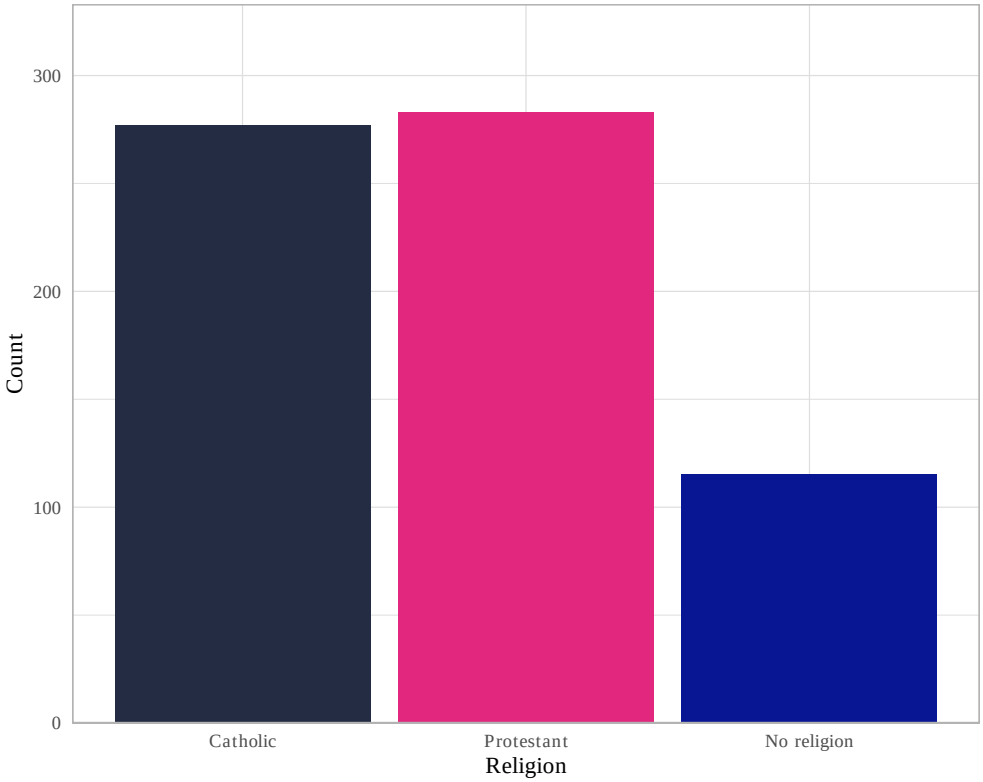

Figure 5: Barplot of Sexual Orientation

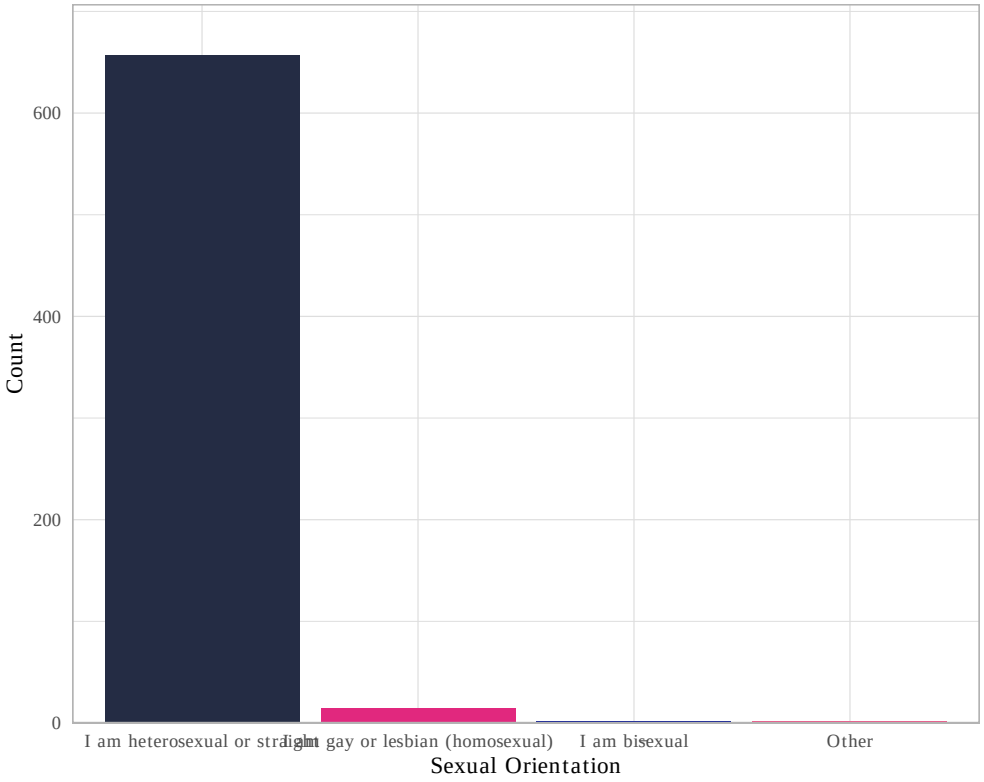

Figure 6: Barplot of Constitutional View

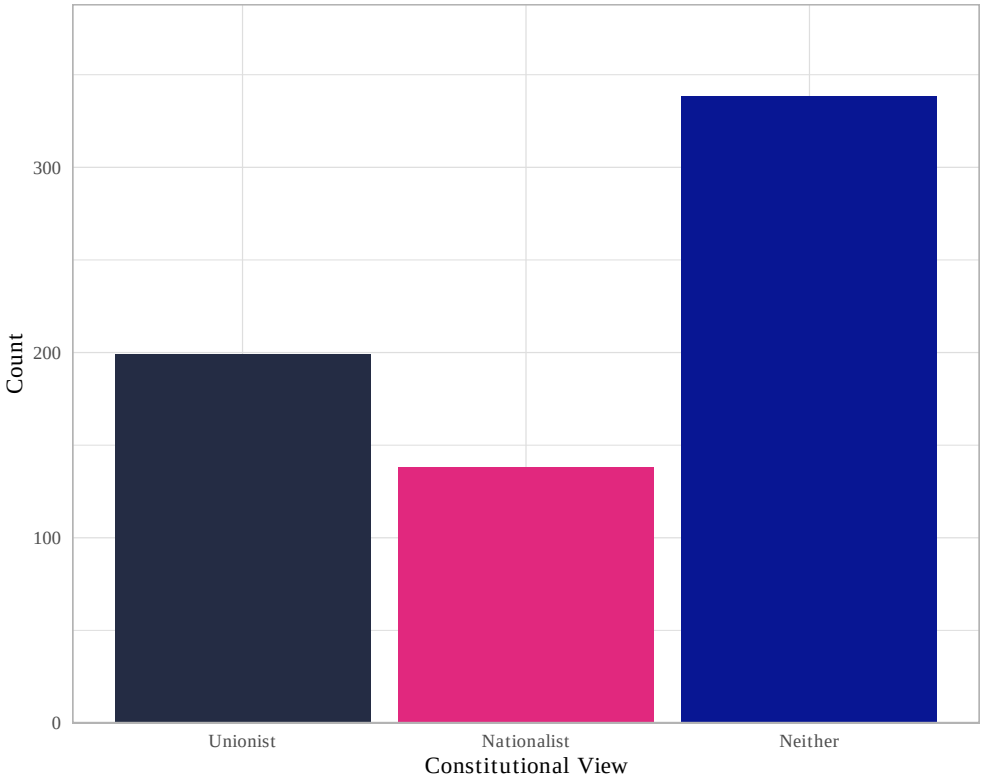

Figure 7: Barplot of Trade union membership

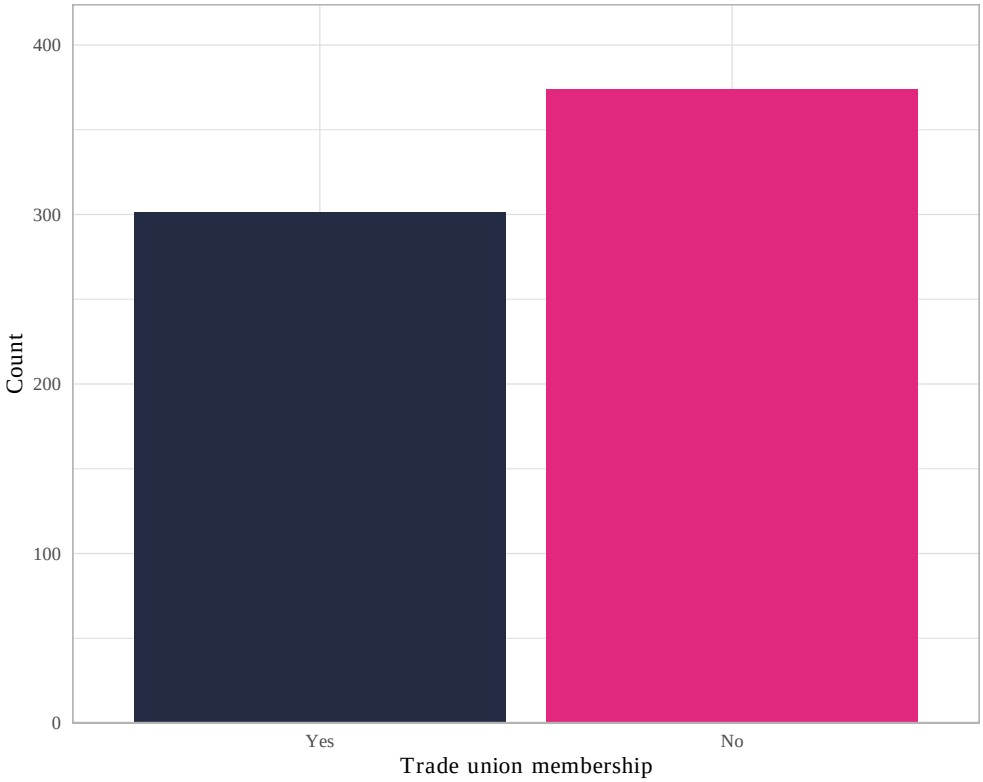

Figure 8: Barplot of Supervisor

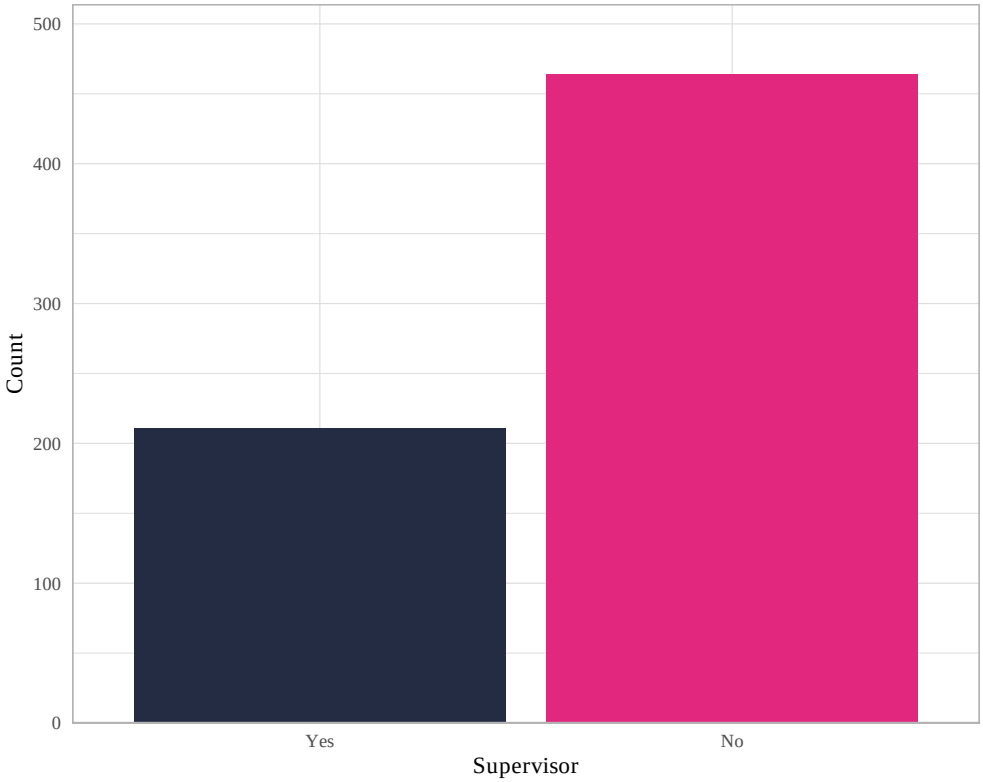

Figure 9: Density plot of Age

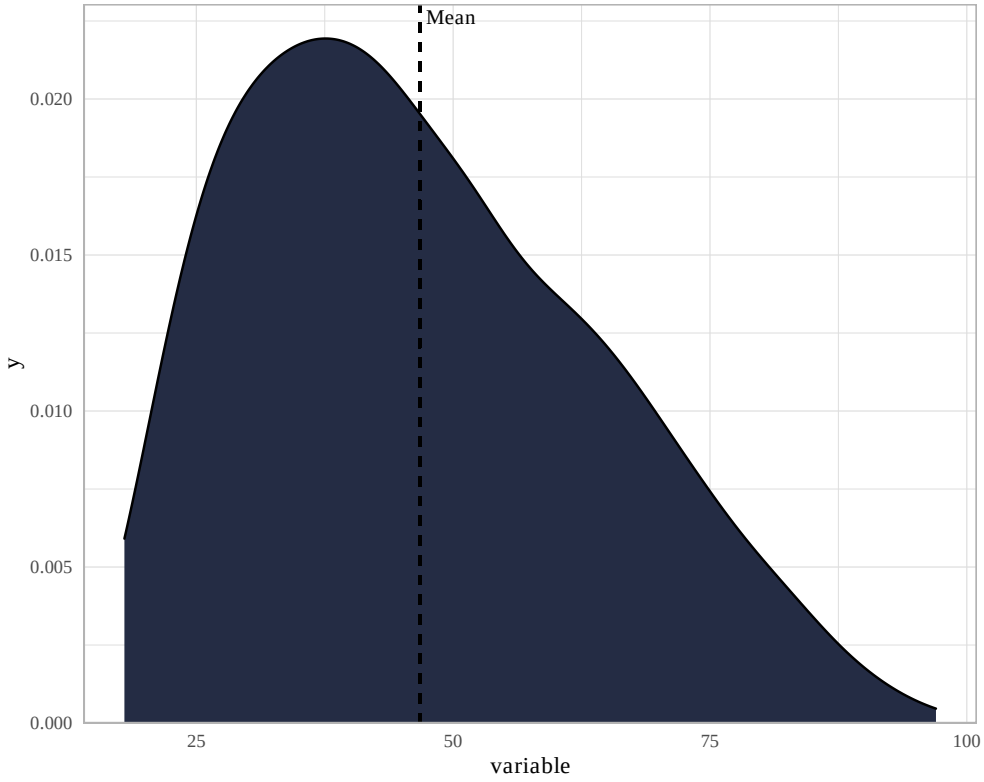

Figure 10: Density plot of Income