Assignment 3 Submission Document

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1. Research Question & Hypothesis

Research Question:

"How do different child-rearing values and parental responsibilities influence respect and love for parents."

Hypothesis:

$\boldsymbol{H_0}$: There is no significant relationship between child-rearing values (Important child qualities) and respect and love for parents.

$\boldsymbol{H_1}$: There is a significant relationship between child-rearing values (important child qualities) and respect and love for parents.

2. Data Overview

The dataset is a comprehensive collection of survey data compiled from the European Values Study (EVS) and the World Values Surveys (WVS). This dataset includes 452 surveys conducted across 115 countries and territories, offering a broad representation of social, cultural, and political values worldwide.

Data Description

- Dataset Name: WVS 1981-2022 trend file
- Source: worldvaluessurvey
- Data Dimension: **442473** x **732**
- Timeframe: 1981–2022
- Dimension of Selected Data: **442473** x **25**

2.1 Composition of the IVS 1981-2022

	IVS	EVS Trend File	WVS Trend File
Survey period	1981-2022	1981-2017	1981-2022
Number of waves	7	5	7
Number of cases	663.965	224.434	442.473
Number of variables	838	635	732
Countries/ territories	120	49	108
Number of surveys	464	160	306

2.3 Selected Key Variables & Justification

Table 1:

Variable Name	Description	Role in Analysis
A025	Respect and love for parents	Dependent
A001	Important in life: Family	Independent
A005	Important in life: Work	Independent
A006	Important in life: Religion	Independent
A007	Service to others important in life	Independent
A026	Parents responsibilities to their children	Independent
A027	Important child qualities: good manners	Independent
A029	Important child qualities: independence	Independent
A030	Important child qualities: hard work	Independent
A032	Important child qualities: feeling of responsibility	Independent
A034	Important child qualities: imagination	Independent
A035	Important child qualities: tolerance and respect for other people	Independent
A038	Important child qualities: thrift saving money and things	Independent
A039	Important child qualities: determination perseverance	Independent
A040	Important child qualities: religious faith	Independent
A041	Important child qualities: unselfishness	Independent
A042	Important child qualities: obedience	Independent
A047	Abortion when child physically handicapped	Independent
A048	Abortion when woman not married	Independent
A058	Spend time with friends	Independent
A060	Spend time with people at your church, mosque or synagogue	Independent
A064	Belong to social welfare service for elderly, handicapped or deprived people	Independent
A065	Member: Belong to religious organization	Independent
A066	Member: Belong to education, arts, music or cultural activities	Independent
A170	Satisfaction with your life	Independent

2.4 Data Cleaning & Preprocessing

Handling Missing Values

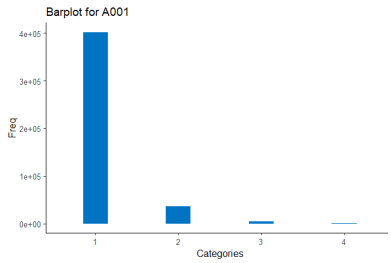
In the selected dataset, there were a number of missing values. These missing values were imputed using the most frequent values for each variable. This method ensures that the missing data is replaced with the value that occurs most frequently in the respective column, preserving the overall distribution of the data.

3. Descriptive Statistics & Visualizations

3.1 Descriptive Statistics of the Variables

Variable Name	Frequencies	
A025	1	419439
	2	23034
A001	1	401312
	2	36193
	3	3909
	4	1059
A005	1	290981
	2	112539
	3	26107
	4	12846
A006	1	225174
	2	95215

	3	72278
	4	49806
A007	1	414116
	2	21171
	3	5776
	4	1410
A026	1	401888
	2	31929
	3	8656
A027	0	5391
	1	388557
A029	0	238400
	1	204073
A030	0	193869
	1	248604
A032	0	138620
	1	303853
A034	0	351064
	1	303853
A035	0	351064
	1	91409
A038	0	286099
	1	156374
A039	0	286835
	1	155638
A040	0	273008
	1	169465
A041	0	310430
	1	132043
A042	0	273318
	1	169155
A047	0	6119
	1	436354
A048	0	435614
	1	6859
A058	1	414955
	2	17384
	3	6938
	4	3196
A060	1	16086
	2	8682
	3	9219
	4	408486
A064	0	438312
	1	4161
A065	0	395431
	1	47042
A066	0	416229
	1	26244
A170	5	60272
	6	48722
	7	66430
	8	86720
	9	44383
	10	61717
	Other	74229
	Total	442,473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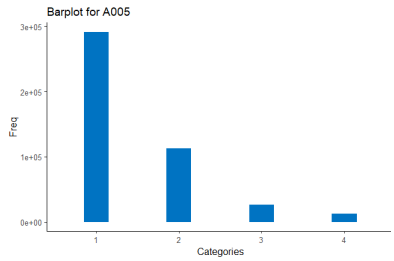
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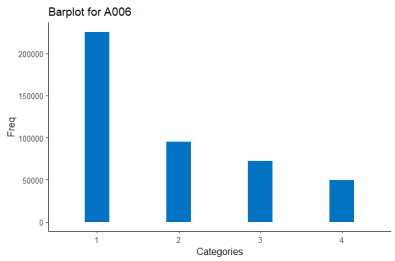
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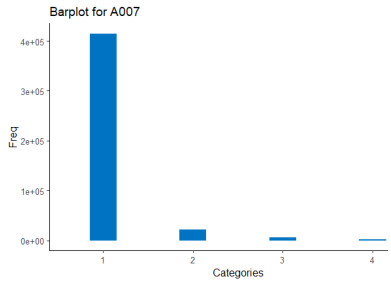
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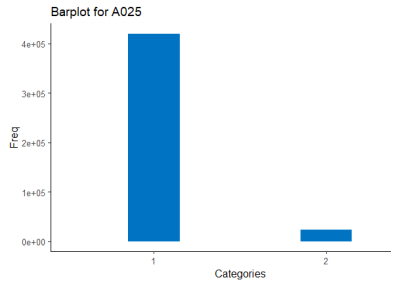
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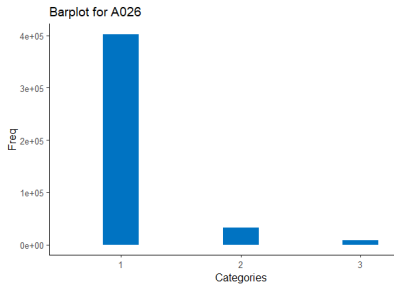
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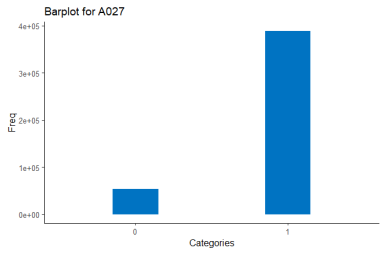
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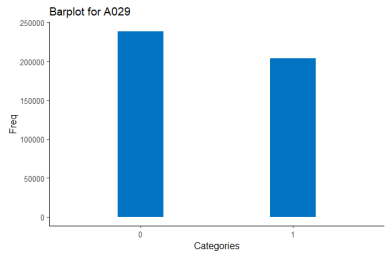
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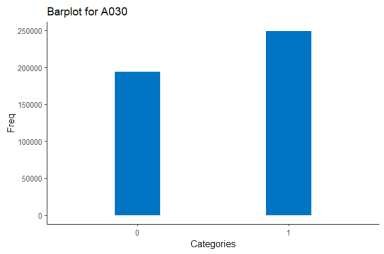
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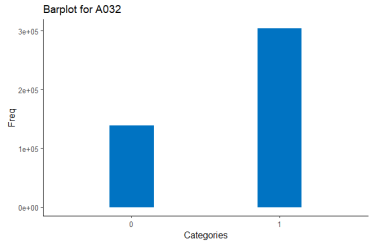
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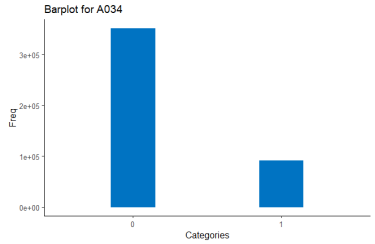
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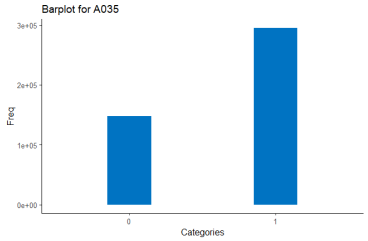
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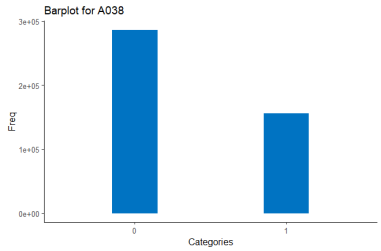
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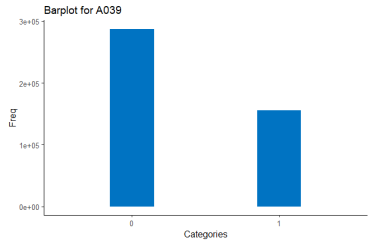
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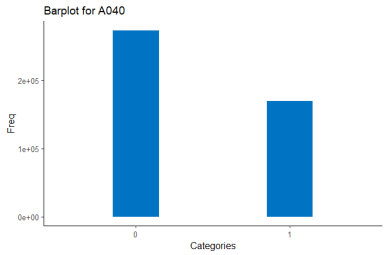
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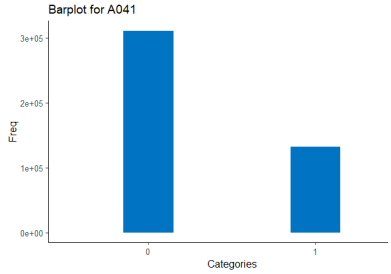
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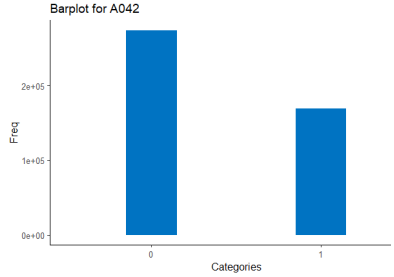
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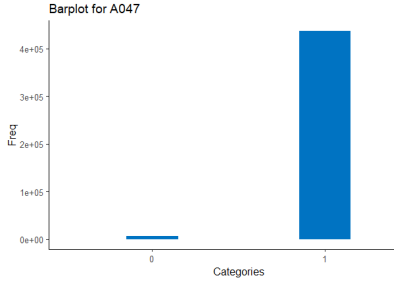
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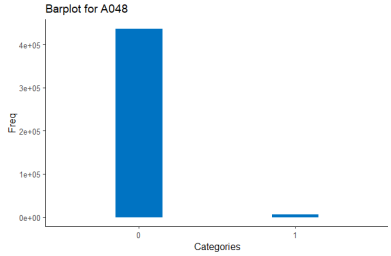
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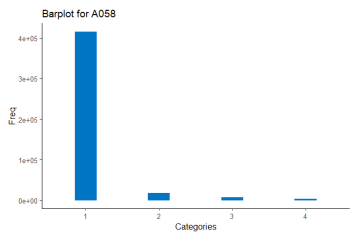
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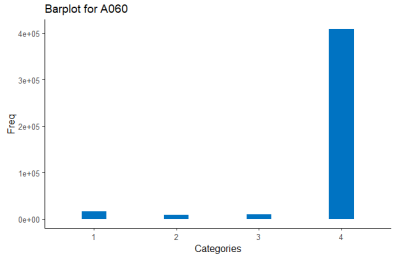
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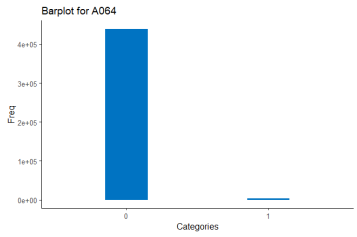
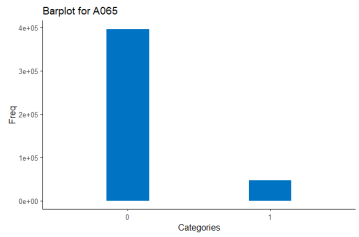
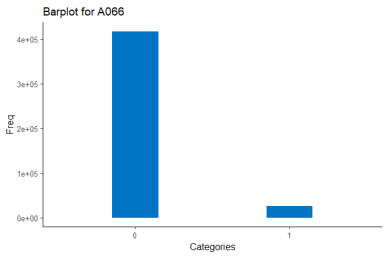
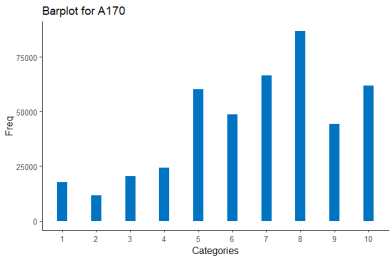


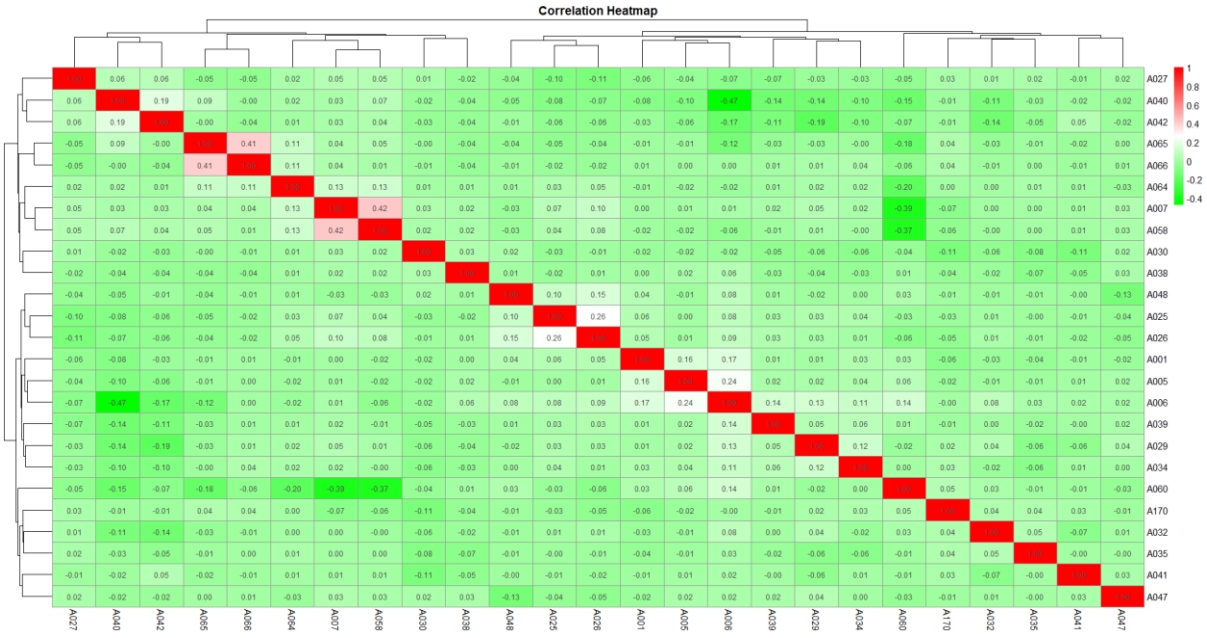






3.2 Correlation among the variables

This correlation heatmap visualizes the relationships between different variables, with red indicating positive correlations and green indicating negative correlations. The intensity of the color corresponds to the strength of the correlation, and the values within the cells provide the correlation coefficients. The dendrograms along the top and left sides reveal clustering patterns among the variables based on their correlation profiles. The heatmap can be used to identify variables that tend to move together or in opposite directions, offering insights into potential dependencies within the dataset.



4. Linear Regression Analysis

After fitting the linear regression model, we evaluated its overall performance using the R-squared (R^2) value, which indicates how well the model explains the variation in the dependent variable. In our case, the R^2 value was 0.08921 meaning that the model explained 8.921% of the variance in the outcome. A higher R^2 indicates a better fit, suggesting that the model does a good job of capturing the relationship between the predictors and the dependent variable.

4.1 Coefficients and Interpretation

In this linear regression analysis, several predictors were evaluated to understand their relationship with the dependent variable. The results show that many of the variables have a significant impact, with their coefficients either positively or negatively affecting the outcome. For instance, the intercept is estimated at 0.990, indicating that when all other predictors are zero, the dependent variable is expected to be around 0.99. Among the predictors, A026 has a large positive effect with a coefficient of 0.132, suggesting that for every one-unit increase in A026, the dependent variable increases by 0.132. On the other hand, A027 shows a negative effect with a coefficient of -0.051, meaning that as A027 increases, the dependent variable decreases by 0.051.

The standard errors of the estimates are generally small, indicating precise estimates for most variables. For example, A026 has a very small standard error of 0.000887, suggesting that its estimate is highly reliable. The t-values, which reflect the ratio of each coefficient to its standard error, are all high, with A026 having a t-value of 148.776, demonstrating its strong significance.

Regarding statistical significance, most variables show highly significant results with p-values less than 2e-16, such as A026, A048, and A001, which all have three asterisks (***), indicating their strong influence on the outcome. Variables like A029 and A032 have p-values of 0.0186 and 0.0019, respectively, showing that they are still significant, though their effects are somewhat less pronounced. In total, the results suggest that the majority of the predictors are significant, with a mix of positive and negative relationships with the dependent variable.

Coefficients	Estimate	Std. Error	t value	Pr(>|t|)	Significance
(Intercept)	0.990002	0.004788	206.76	< 2e-16	***
A026	0.132007	0.000887	148.77	< 2e-16	***
A027	-0.05122	0.000993	-51.57	< 2e-16	***
A029	0.001573	0.000669	2.352	0.018651	*
A030	-0.01611	0.000661	-24.37	< 2e-16	***
A032	-0.00219	0.000704	-3.108	0.001883	**
A034	0.010103	0.000806	12.54	< 2e-16	***
A035	-0.00265	0.000688	-3.853	0.000117	***
A038	-0.01461	0.000676	-21.60	< 2e-16	***
A039	-0.00307	0.000684	-4.49	7.14E-06	***
A040	-0.01631	0.000764	-21.36	< 2e-16	***
A041	-0.00679	0.000708	-9.59	< 2e-16	***
A042	-0.01499	0.000696	-21.53	< 2e-16	***
A047	-0.02965	0.002765	-10.72	< 2e-16	***
A048	0.111625	0.002642	42.255	< 2e-16	***
A001	0.017882	0.00092	19.447	< 2e-16	***
A005	-0.00538	0.000452	-11.91	< 2e-16	***
A006	0.006553	0.000364	18.011	< 2e-16	***
A007	0.025353	0.001059	23.946	< 2e-16	***
A058	0.003615	0.000915	3.952	7.76E-05	***
A060	-0.00691	0.000591	-11.693	< 2e-16	***
A064	0.041245	0.003404	12.116	< 2e-16	***
A065	-0.02573	0.001166	-22.073	< 2e-16	***
A066	-0.00949	0.00149	-6.369	1.90E-10	***
A170	-0.00129	0.000135	-9.579	< 2e-16	***

5. Conclusion