

An Analysis of “Am I The Jerk?”

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1 Introduction

This report presents an analysis of a survey conducted across three classes, aiming to understand how different demographic factors influence people’s responses to hypothetical ethical scenarios. The survey collected responses on various attributes, including age, academic year, political views (both personal and parental), gender, and religiousness. Participants were also presented with 14 hypothetical scenarios, each describing a challenging ethical situation involving family dynamics and financial decisions. The goal is to analyze whether specific themes emerge within these scenarios and how demographic variables impact participants’ responses. The primary research questions for this analysis focus on understanding how the hypothetical questions are clustered and identifying any commonalities in their themes. Furthermore, the analysis aims to determine the correlation between responses within the money-related cluster of questions and to explore how the academic year and the political views of the survey takers influence their responses to this cluster. Moreover, this study is particularly interested in exploring whether an individual’s political orientation influences their decision-making and moral reasoning in complex scenarios. By understanding these relationships, we hope to shed light on the broader impact of personal and demographic factors on ethical decision-making.

2 Data Cleaning

The initial step involved removing duplicate rows and handling missing values. Duplicate entries were removed using the `drop_duplicates()` method, although no reasonable duplicates were found due to the unique timestamps for each response. Missing values were handled by dropping rows with missing data using the `dropna()` method.

After handling duplicates and missing values, the next step was to select the most relevant columns for analysis. A list of important columns (`short_cols`) was created, containing demographic information and responses to fourteen hypothetical ethical scenarios (Q1 - Q14). For `df_fardina`, a new dataframe

(`df_fardina_non_priming`) was created by excluding a specific column assumed to be related to a priming effect. This ensured the analysis focused on relevant variables while excluding unnecessary information. Column names varied between datasets, so they were standardized to enable merging. Mappings (`fardina_col_mapping` and `max_col_mapping`) were applied to rename columns in `df_fardina` and `df_max` to match `short_cols`, resulting in `df_fardina_final` and `df_max_final`. This standardization was crucial for seamless merging and consistency across all datasets. Once standardized, the cleaned datasets (`df_fardina_final` and `df_max_final`) were concatenated into a single dataframe called `df_2023_final`. During this process, the misspelled value "Famale" in the Gender column was corrected to "Female," ensuring consistency in the data.

The dataset `df_2024` required additional cleaning operations to align it with the other datasets. One specific adjustment involved the column titled "How would you rate your religiousness?". After addressing this issue, a column mapping similar to the one used for `df_fardina` and `df_max` was applied to `df_2024`, resulting in a renamed dataframe called `df_2024_final`. This standardization step ensured that this dataset could be seamlessly integrated with the other datasets, without discrepancies in column names or terminology.

After cleaning and standardizing the individual datasets, the final step in the data cleaning process was to merge them into a single unified dataframe. The datasets `df_2023_final` and `df_2024_final` were concatenated, resulting in a comprehensive dataframe named `df_all`, which contained all relevant data from the three original datasets. This final merge produced a complete dataset that was clean, consistent, and ready for analysis.

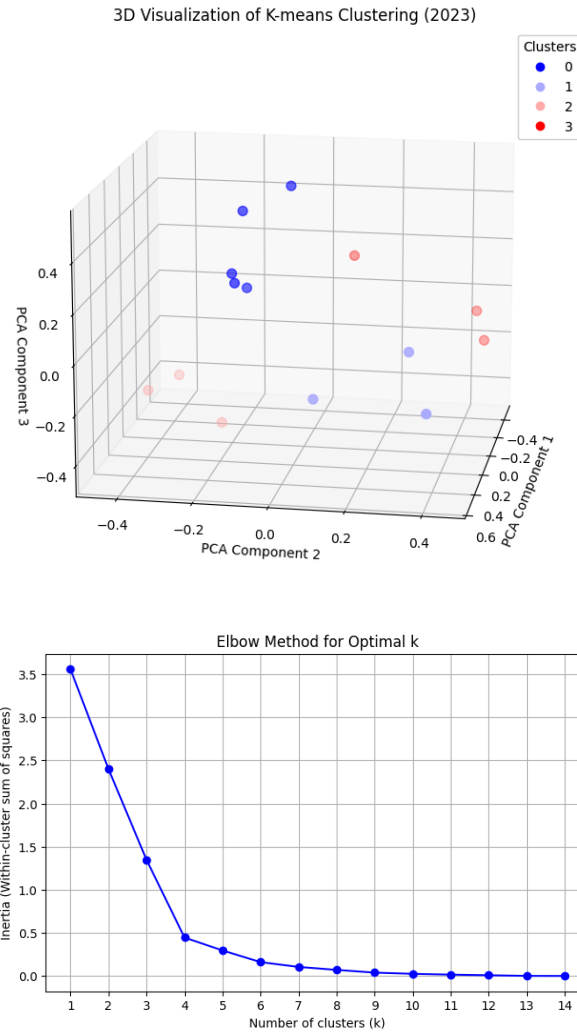
3 Findings & Analysis

3.1 Leveraging Clusters to Group Similar Questions

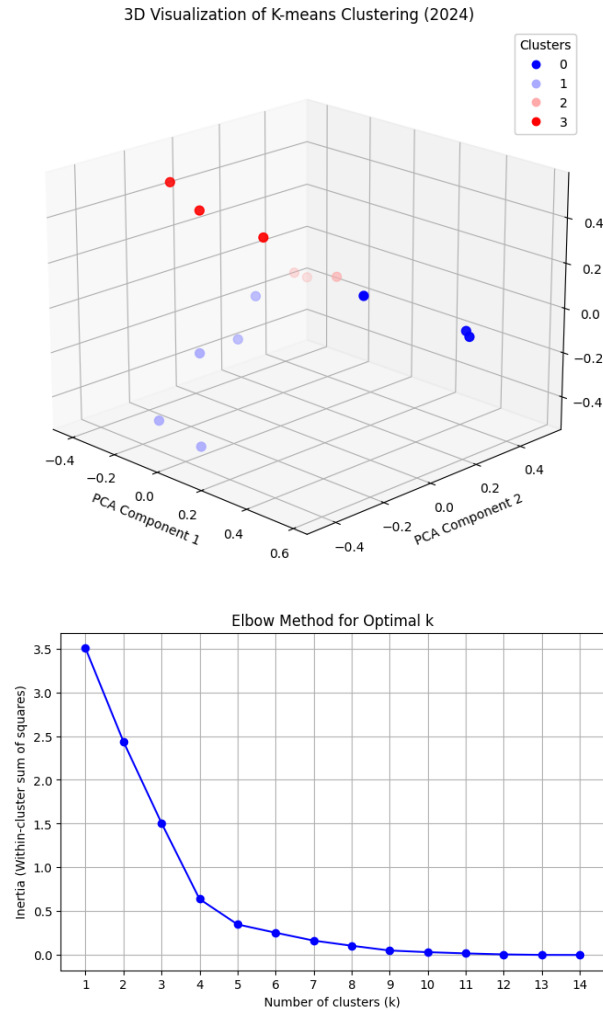
To begin our analysis, we used K-means clustering combined with TF-IDF (Term Frequency-Inverse Document Frequency) to group the "Am I the Jerk?" questions into four clusters. The goal of clustering was to identify natural groupings of questions based on their text content, helping us explore whether similar questions shared common themes (such as family-related or financial-related dilemmas).

The TF-IDF technique was used to transform the text of each question into numerical vectors, capturing the importance of each word in relation to its frequency within the dataset. Words that are frequent across all questions were given less weight (e.g., "the", "a"), while words that are more meaningful for distinguishing between questions (e.g., "family", "trust", "parent") were weighted higher. Next, we used PCA (Principal Component Analysis) to reduce the

dimensionality of the TF-IDF vectors (containing 288 dimensions) and visualize the clusters in three dimensions to reduce noise and bring out the most important features. Subsequently, using the unsupervised K-means clustering algorithm aims to partition the questions into k clusters by minimizing the variance within each cluster. For this analysis, we noticed the elbow point occurred at $k = 4$ indicating four clustered themes of questions. Now, because the 2023 dataset had different gendered questions than that of the 2024 dataset, two clustered plots were created to account for minute differences from the TF-IDF algorithm. Finally, the plots below shows how the questions were grouped for 2023,



and for 2024.



Each color in the scatter plot represents a cluster, with questions in the same cluster sharing more text-based similarities. Upon reviewing the clusters, the following themes emerged:

- Family-related dilemmas
- Responsibility dilemmas
- Financial-related dilemmas
- Ethical dilemmas

The clustering algorithm successfully grouped questions with common themes, providing a meaningful way to categorize the responses for further analysis. One thing to note is that the order of the themes of the clusters for the 2023 plot was reversed compared to the 2024 plot.

Although the 2023 and 2024 datasets shared common theme-based clusters, certain questions were assigned to different clusters. To ensure consistency in the analysis of themed clusters, we took the intersection of clusters of questions using `setA.intersection(setB)` for each theme and utilized the combined dataset, rather than analyzing the two datasets separately.

3.2 The Effect of Academic Year on the Financial-Related Cluster

Out of interest, we selected the financial-related cluster from the K-means clustering results for further analysis. Our goal was to determine whether the academic year of the respondent had a statistically significant effect on their judgments in financial-related ethical dilemmas. The questions of interest were as follows:

- (Q4) “My wife and I have separate finances, but I pay for almost everything. My son starts school next year, and I’m planning on sending him to a private school. My wife’s son currently goes to a much less nice public school. My wife says I’m a jerk for not paying for her daughter to go to private school as well.”
- (Q10) “One of my children wants to go to an expensive school to become a dentist. I told them I’d be fine paying for it. The other one wants to go to a similarly expensive school to become a teacher. I told her that I wouldn’t pay for her schooling unless she picked a career path that will make at least 100,000 a year. Am I a jerk?”

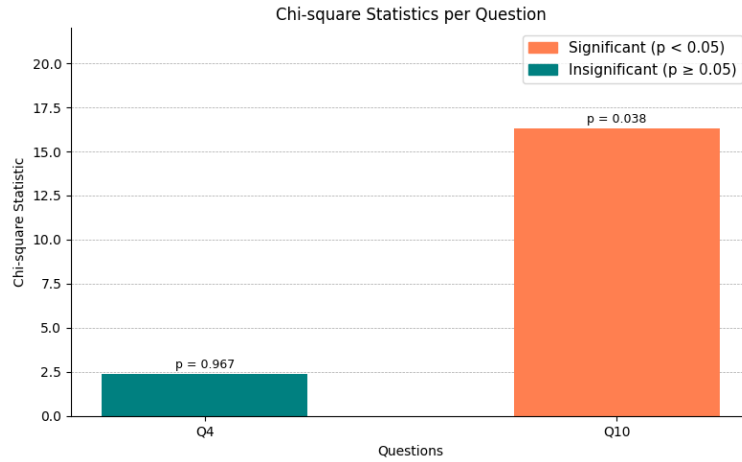
Now, to see whether or not the academic year affects any of the financial related dilemmas, we have the following hypothesis for each question:

$$\left\{ \begin{array}{l} H_o : \text{The academic year has no significant effect on respondents' moral judgements in financial-related dilemmas} \\ H_a : \text{The academic year has a significant effect on respondents' moral judgements in financial-related dilemmas} \end{array} \right.$$

To test this hypothesis, we applied a Chi-square test for independence at a significance level of $\alpha = 0.1$ for each question simultaneously. This particular significance level was arbitrarily chosen since we have a small sample size and as just looking for some level of association between the variables. However, to be cautious of making a Type I error, we applied the Bonferroni Correction method. Instead of simply comparing the p-value of each test to the significance level, for n tests we compared the p-value to α/n . This ensured a more accurate analysis of statistically significant results.

First, we created a contingency table showing the relationship between the

respondents' academic year and their responses to financial-related dilemmas (e.g., "Not a jerk", "Mildly a jerk", "Strongly a jerk"). Then, we obtain the test statistic, χ^2 , and the p-value for each question. Finally, the following graph depicts the whether or not the results of the test were significant or not.



As shown above, the Chi-Square tests produced a p-value of 0.967 for Q4 and 0.038 for Q10. For Question 4, the p-value is greater than the Bonferroni significance level of 0.05, indicating that we fail to reject the null hypothesis. This implies that the academic year does not have a statistically significant effect on the respondents' judgments in Question 4's dilemma regarding a family's separated finances for children. On the other hand, for Question 10, the p-value is less than the Bonferroni significance level indicating that we reject the null hypothesis. This implies that the academic year does indeed have a statistically significant effect on the respondents' judgments in Question 10's dilemma regarding paying for expensive schooling for a poorly paying career.

While academic year seems to have only influenced how respondents judge financial-related issues for one of the two questions, the results suggest that there is some partial association but no generalization can be made about the moral judgments in this category of dilemmas.

3.3 The Effect of Political View on the Financial-Related Cluster

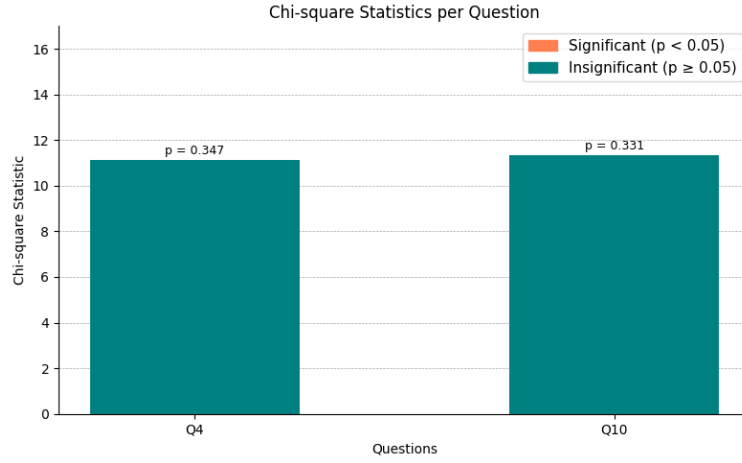
Since there were no meaningful results from our preliminary test, we again selected the financial-related cluster for further analysis. However, this time we tried to determine whether the political view of the respondent had a statistically significant effect on their judgments in financial-related ethical dilemmas.

Similar to the initial tests, to see whether or not the political view of the individual affects any of the financial related dilemmas, we have the following

hypothesis for each question:

$$\begin{cases} H_o : \text{The political view has no significant effect on respondents' moral judgements in financial-related dilemmas} \\ H_a : \text{The political view has a significant effect on respondents' moral judgements in financial-related dilemmas} \end{cases}$$

Subsequently, we repeat the same process of conducting multiple Chi-Square Tests for Independence at a significance level of $\alpha = 0.1$ using the Bonferroni Correction here as well. As a result, the following graph depicts the whether or not the results of the test were significant or not.



Surprisingly, the Chi-Square tests produced a p-value of 0.347 for Q4 and 0.331 for Q10. Here, both questions have similar p-values greater than the Bonferroni significance level of 0.05, indicating that we fail to reject the null hypothesis in either case. This implies that the academic year does not have a statistically significant effect on the respondents' judgments in Question 4 or Question 10's financial dilemmas.

While the academic year tests suggest some partial association, we found the political views of the individual had no significance regarding the moral judgments in this category of dilemmas.

4 Conclusion

This study aimed to understand how demographic factors, specifically academic year and political views, influence individuals' responses to hypothetical ethical scenarios involving financial dilemmas. By analyzing survey data from three

classes—including demographic information and responses to 14 ethical questions—we aimed to identify common themes among the questions and assess the impact of certain demographics on moral judgments.

We employed K-means clustering combined with TF-IDF vectorization and Principal Component Analysis to group the ethical questions into four thematic clusters: family-related dilemmas, financial-related dilemmas, responsibility dilemmas, and ethical dilemmas. Focusing on the financial-related cluster, we conducted Chi-square tests for independence at a significance level of $\alpha = 0.1$, applying the Bonferroni Correction for multiple comparisons. The results indicated that academic year significantly affected responses to one of the two financial dilemmas (Question 10), while political views did not show a significant impact on responses to either question.

Limitations of this study include the homogeneity and limited size of the sample, which consisted solely of students from three classes, potentially affecting the generality of the findings. The ethical scenarios were also limited in scope, possibly not capturing the full range of moral dilemmas individuals encounter. Future research could address these limitations by involving a more diverse and larger sample size, incorporating a wider array of ethical questions, and possibly including qualitative data to gain deeper insights into the reasoning behind participants' judgments.

In conclusion, the study suggests that academic progression may influence ethical judgments in certain financial contexts, whereas political orientation does not appear to have a significant effect within this sample. These findings highlight the importance of considering multiple demographic variables in ethical decision-making research to better appreciate the complexities of moral judgment.