

# Effects of the Four-Day Workweek on Salary Expectations

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## Contents

|          |                            |          |
|----------|----------------------------|----------|
| <b>1</b> | <b>Introduction</b>        | <b>1</b> |
| <b>2</b> | <b>Experimental Design</b> | <b>1</b> |
| <b>3</b> | <b>Analysis</b>            | <b>3</b> |
| <b>4</b> | <b>Conclusion</b>          | <b>7</b> |
| <b>5</b> | <b>Appendix</b>            | <b>8</b> |

## 1 Introduction

The idea of a four-day workweek has gained a lot of attention among employees as organizations investigate ways to improve work-life balance, boost productivity, and enhance employee well-being. Our observations show that previous research often focuses on how a shorter workweek affects job performance, satisfaction, and overall work-life balance. However, it does not detail individuals' financial threshold regarding a minimum acceptable pay in response to less working hours. Our study will explore the trade-off between financial considerations and work-life balance by addressing the following research question:

*How much of a salary reduction are employees willing to accept for a four-day workweek?*

One notable study is the UK's four-day workweek pilot which provides insights into the results of their study involving 61 companies and 2,900 workers who transitioned from a five-day to a four-day workweek over the six-month trial period. The evidence from this study indicates a strong preference among employees for the additional day off. Specifically, the results revealed that 15% of employees indicated no amount of monetary compensation would entice them to return to a five-day workweek. Furthermore, 37% of respondents required a 26%-50% pay increase, and 54% required a 10%-25% pay increase to revert to the traditional schedule.<sup>1</sup>

Our study aims to examine whether employees in the United States exhibit similar valuation for a four-day workweek but with a focus on the willingness to accept a salary reduction for a decreased workload instead of a salary increase for an increased workload as was done in the UK's four-day workweek pilot. By employing a between-subjects experimental design, we propose to measure the causal effect of a four-day workweek compared to a five-day workweek on the minimum acceptable salary among survey respondents. This approach ensures that observed differences can be attributed to the treatment effect rather than confounding variables.

Studying the shift from a five-day to a four-day workweek within the current context of predominantly five-day schedules enhances the external validity of our research. It allows for greater generalizability of our findings to organizations still following the conventional five-day workweek structure. This design enables us to provide more comprehensive insights into how US employees today balance their work-life priorities with their financial needs when considering a reduction in working hours.

## 2 Experimental Design

Our study utilized a between-subjects survey design to capture the causal effect of a four-day workweek on the acceptable salary reduction among employees. The survey was constructed on Qualtrics containing 16 questions related to demographic information, employment status, job satisfaction, and willingness to accept a salary reduction for a four or five-day workweek.

The survey was distributed by PureSpectrum, a market research technology company, to a total sample of 350 US employees who work five-day workweeks and are not self-employed. However, our findings will contain 304 participants, following the exclusion of responses from a pilot launch that was conducted to A/B test the survey. To ensure we could accurately detect the effect of a four-day workweek, we performed a power analysis and determined that a sample size of 250 participants was required. We aimed to detect a minimum effect size of 5% using a between-subjects design with 80% power. The 80% power threshold was chosen after considering what we found acceptable and based on recommendations from several statistical websites, which indicated that 80% power is a common standard in socioeconomic studies<sup>2</sup>. This level of power ensures that our analysis has an 80% probability of correctly rejecting the null hypothesis when it is false, thereby minimizing the risk of Type II errors.

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<sup>1</sup>The Results Are In: The UK's Four-Day Week Pilot," Autonomy, February 2023. <https://autonomy.work/wp-content/uploads/2023/02/The-results-are-in-The-UKs-four-day-week-pilot.pdf>.

<sup>2</sup>Statistics Solutions. "Statistical Power Analysis." Retrieved from <https://www.statisticssolutions.com/dissertation-resources/sample-size-calculation-and-sample-size-justification/statistical-power-analysis/>.

The treatment and control groups were evenly split, both containing 152 survey participants. Participants were randomly assigned to the treatment and control groups using Qualtrics' randomization feature. This random assignment occurred after all demographic, employment, and job satisfaction questions were completed.

The final question was designed to capture the potential outcomes for both the control and treatment groups, denoted as  $Y_i(0)$  and  $Y_i(1)$ , respectively. In this scenario, respondents in both groups were presented with a hypothetical situation in which they were applying for a job with the same role and position as their current employment. They were then asked to specify the minimum salary they would accept in exchange for a job that offered a five-day workweek for the control group or a four-day workweek for the treatment group (reference appendix 3 & 4). The salary options provided ranged from 110% to 60% of the respondent's current pay, in 5% increments. These responses represent the realized outcomes  $Y_i(0)$  and  $Y_i(1)$ , respectively. This design allows us to calculate and compare the mean percentage of salary reduction (ATE) between the two groups.

For an overview of the survey flow, please refer to the CONSORT flow diagram (Figure 1) in the Appendix. This setup, while ensuring a successful randomization procedure, allows for the estimation of the causal effect of a four-day workweek, which is our intervention or treatment, on the minimum acceptable percentage of salary compared to the control group's minimum acceptable percentage of salary. Thus, we formulate our two-tailed null and alternative hypotheses as follows:

**Null Hypothesis ( $H_0$ ):** The mean acceptable percentage of salary US employees are willing to accept for a five-day workweek is equal to the mean acceptable percentage of salary US employees are willing to accept for a four-day workweek.

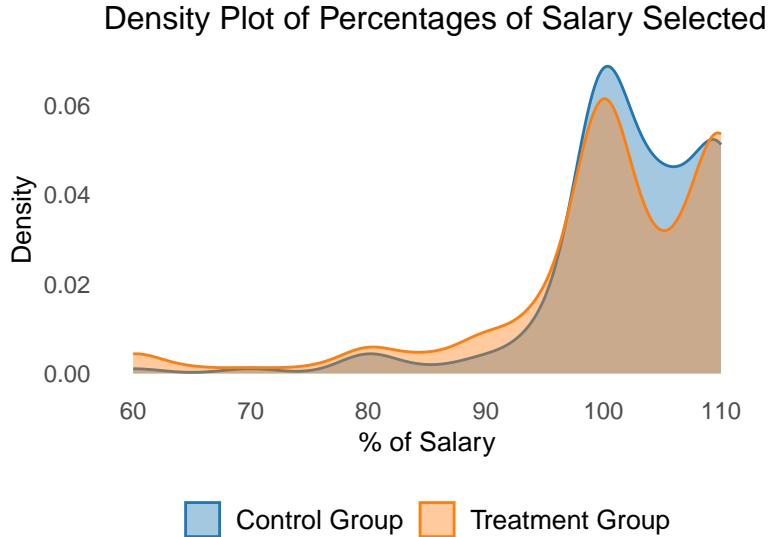
**Alternative Hypothesis ( $H_1$ ):** The mean acceptable percentage of salary US employees are willing to accept for a five-day workweek is not equal to the mean acceptable percentage of salary US employees are willing to accept for a four-day workweek.

To assess the effectiveness of the Qualtrics randomization feature and ensure that the treatment assignment was successful, we created a null model with the treatment variable (participants in the treatment group were indicated by a 1 and those in the control group by a 0) and an intercept term. We then created a full model regressing the treatment indicator variable against all demographic, satisfaction, and employment variables. This allowed us to perform an F-test to evaluate whether the model with additional covariates provided any predictive power in determining the group assignment (treatment or control). Results from the F-test had a p-value of 0.658 which indicates that our random assignment was successful. We thereby determine that results from the F-test indicated a lack of predictive relationships between any of the covariates and the treatment assignment. Thus, we concluded that the addition of covariates did not alter the predictive behavior of the treatment indicator compared to the null model.

Table 1: Randomization Check

| Res.Df | RSS      | Df  | Sum of Sq | F         | Pr(>F)    |
|--------|----------|-----|-----------|-----------|-----------|
| 251    | 63.99389 | NA  | NA        | NA        | NA        |
| 303    | 76.00000 | -52 | -12.00611 | 0.9055953 | 0.6579861 |

### 3 Analysis



The density plot above illustrates the distribution of the minimum acceptable percentage of current salary for both the control and treatment groups. The distributions appear similar overall, with the control group showing a slightly higher density at the 100%-105% salary levels and the treatment group displaying slightly higher densities below the 95% salary level. This suggests that the treatment group is marginally more willing to accept a salary reduction for a four-day workweek compared to the control group's willingness to accept a salary reduction to maintain a five-day workweek.

A notable observation is the large number of individuals in the treatment group who chose 110% as the minimum percentage of salary they would accept to work one less day. This indicates that they would not accept their current salary even if it meant working fewer days. This potentially counter intuitive result suggests that there may have been misunderstandings in the interpretation of our question or unaccounted factors influencing their decision.

To further understand the difference between the treatment and control groups, we initially created two new variables. The dataset, due to the between-subjects survey design, contains two separate columns for the control group's realized outcome  $Y_i(0)$  and the treatment group's realized outcome  $Y_i(1)$ . We combined these into a single column,  $Y_i$ , to facilitate the analysis of the treatment effect. Additionally, we created a new treatment column to indicate whether a participant was in the treatment or control group.

The treatment effect to answer our research question is defined as the difference between the expected outcomes of the minimum acceptable percent of salary for the treatment and control groups. We estimate the treatment effect using a regression model, regressing the treatment indicator variable on the outcome variable  $Y_i$ . The estimated coefficient of the treatment variable represents the average treatment effect (ATE) of a four-day workweek on the minimum acceptable percentage of salary compared to the control group.

$$Y_i = \alpha + \beta \cdot \text{treatment}_i$$

$Y_i$  is the minimum acceptable percent of salary and  $\text{treatment}_i$  is the treatment indicator variable. The coefficient  $\beta$  represents the ATE of a four-day workweek on the minimum acceptable percent of salary.

**Table 2: Models with Robust Standard Errors**

|   | Dependent variable:                     |                      |                       |
|---|---|----------------------|-----------------------|
|   | Percent Difference in Acceptable Salary |                      |                       |
|   | (1)                                     | (2)                  | (3)                   |
| Treatment (Four-Day Workweek)               | -2.072*                                 | -2.355**             | -7.358                |
|   | (1.088)                                 | (1.097)              | (6.148)               |
| House Income                                | 0.00000                                 | 0.00000              |                       |
|   | (0.00000)                               | (0.00000)            |                       |
| Hours Worked (48 Hours or More)             | -2.216                                  | -1.877               |                       |
|   | (1.523)                                 | (1.682)              |                       |
| Hours Worked (Under 32 Hours)               | -1.865                                  | -3.954               |                       |
|   | (1.835)                                 | (2.634)              |                       |
| Age   | 0.024                                   | -0.010               |                       |
|   | (0.040)                                 | (0.056)              |                       |
| Job Satisfaction (Dissatisfied)             | 1.712                                   | 2.480                |                       |
|   | (2.308)                                 | (2.616)              |                       |
| Job Satisfaction (Satisfied)                | 1.094                                   | 1.193                |                       |
|   | (1.887)                                 | (1.866)              |                       |
| Pay Type (Hourly)                           | 2.557**                                 | 1.442                |                       |
|   | (1.284)                                 | (1.446)              |                       |
| Treatment * House Income                    |   | -0.00000             |                       |
|   |   | (0.00000)            |                       |
| Treatment * Hours Worked (48 Hours or More) |   | -0.654               |                       |
|   |   | (3.212)              |                       |
| Treatment * Hours Worked (Under 32 Hours)   |   | 4.917                |                       |
|   |   | (3.695)              |                       |
| Treatment * Age                             |   | 0.066                |                       |
|   |   | (0.082)              |                       |
| Treatment * Job Satisfaction (Dissatisfied) |   | -1.867               |                       |
|   |   | (4.849)              |                       |
| Treatment * Job Satisfaction (Satisfied)    |   | 0.059                |                       |
|   |   | (4.090)              |                       |
| Treatment * Pay Type (Hourly)               |   | 2.716                |                       |
|   |   | (2.645)              |                       |
| Constant                                    | 102.368***<br>(0.631)                   | 99.251***<br>(2.729) | 101.586***<br>(3.519) |
| Observations                                | 304                                     | 304                  | 304                   |
| R <sup>2</sup>                              | 0.012                                   | 0.043                | 0.060                 |
| Adjusted R <sup>2</sup>                     | 0.009                                   | 0.017                | 0.011                 |

*Note:*

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

We proceed with the results from the model mentioned above and an additional fully saturated model while grounding our analysis in two key assumptions: excludability and noninterference. Excludability implies that the treatment effect we observe,  $\beta$ , can be attributed solely to the intervention. For instance, the data was collected on a single day where we would believe that shifts in external economic conditions affecting salary expectations could not have interfered with the exclusion restriction. Further, based on confirmation with our survey distributor, we assume that one participant's treatment assignment does not affect another participant's outcome.

Table 2 presents an overview of three regression models for the treatment effect. The first model is a simple regression that includes only the treatment variable, while the second model is a multiple regression that incorporates key covariates of interest, and the third model analyzes heterogeneous treatment effects by utilizing a fully saturated model.

While constructing our second and third models, we included covariates of interest from the demographic and employment sections of the survey. These pre-treatment covariates were chosen because we hypothesize they could strongly predict potential outcomes, thus improving the precision of our estimates. Since the treatment question was the last section in the survey and participants could not go back to modify their responses, we are confident that the included covariates are indeed pre-treatment variables. This ensures that our covariates are not influenced by the treatment and do not introduce bias into our models.

In our simple regression model, we find that a four-day workweek is associated with a reduction in acceptable salary by -2.0724. However, the p-value is 0.0577, which leads us to fail to reject the null hypothesis at the 5% significance level. Even if this result were significant, the practical significance of a 2% difference in minimum accepted salary is minimal in a business context. This result indicates that there is no meaningful causal effect between the minimum accepted percentage of salary for a four-day workweek job offer when compared to a five-day workweek job offer. In other words, based on our study, employees are not willing to give up any portion of their pay even if they are given a job offer working one less day a week.

Finally, we present the results from our third model, which extends our second model by incorporating interactions between the treatment assignment variable and all included covariates. This allows us to examine whether there are any heterogeneous treatment effects—i.e., whether the impact of the treatment on the average percentage of salary selected varies across different levels of the covariates. However, we do not observe any statistically significant heterogeneous treatment effects across any of our pre-treatment covariates, leading us to conclude that there is no evidence of heterogeneous treatment effects in our data.

One plausible explanation for the lack of significant findings could be the limited sample size, which may have reduced the statistical power of our analysis, thereby hindering our ability to detect significant differences. Although as previously mentioned, we did conduct a power analysis, the results were given a minimum detectable effect size of 5%. Therefore, we may not have had a large enough sample to detect a statistically significant difference of -2.0724%. Furthermore, the low adjusted  $R^2$  values of our models suggest that they have limited explanatory power, potentially indicating that important factors influencing salary expectations were not accounted for in our models.



The results of our study were unexpected, as we initially hypothesized that individuals with higher household incomes would be more willing to forgo a larger portion of their salary. However, our analysis did not support this hypothesis. The coefficient for the household income variable was close to zero, with an equally small standard error. Upon further examination of the distribution of the outcome variable—percent of salary

indicated by respondents—we observed that the majority of participants, in both the control and treatment groups, selected exactly 100%. To better illustrate this pattern, we present a plot above, where we have filtered out eight outliers who reported household incomes exceeding \$200,000, allowing us to more clearly display the behavior of the outcome variable across the indicated household income range. For a complete view, including the full scatter plot, please refer to Figure 5 in the appendix.

Further analysis of the data confirmed that there was no pattern in minimum acceptable salaries across different salary levels. The absence of an effect is likely influenced by the fact that the majority of participants were unwilling to give up any portion of their income, leading to no statistically significant observed impact.

**Table 3: Models with Robust Standard Errors and Bonferroni Correction**

|   | <i>Dependent variable:</i>              |                      |                       |
|---|---|----------------------|-----------------------|
|   | Percent Difference in Acceptable Salary |                      |                       |
|   | (1)                                     | (2)                  | (3)                   |
| Treatment (Four-Day Workweek)               | -2.072<br>(1.088)                       | -2.355<br>(1.097)    | -7.358<br>(6.148)     |
| House Income                                |   | 0.00000<br>(0.00000) | 0.00000<br>(0.00000)  |
| Hours Worked (48 Hours or More)             |   | -2.216<br>(1.523)    | -1.877<br>(1.682)     |
| Hours Worked (Under 32 Hours)               |   | -1.865<br>(1.835)    | -3.954<br>(2.634)     |
| Age   |   | 0.024<br>(0.040)     | -0.010<br>(0.056)     |
| Job Satisfaction (Dissatisfied)             |   | 1.712<br>(2.308)     | 2.480<br>(2.616)      |
| Job Satisfaction (Satisfied)                |   | 1.094<br>(1.887)     | 1.193<br>(1.866)      |
| Pay Type (Hourly)                           |   | 2.557<br>(1.284)     | 1.442<br>(1.446)      |
| Treatment * House Income                    |   |                      | -0.00000<br>(0.00000) |
| Treatment * Hours Worked (48 Hours or More) |   |                      | -0.654<br>(3.212)     |
| Treatment * Hours Worked (Under 32 Hours)   |   |                      | 4.917<br>(3.695)      |
| Treatment * Age                             |   |                      | 0.066<br>(0.082)      |
| Treatment * Job Satisfaction (Dissatisfied) |   |                      | -1.867<br>(4.849)     |
| Treatment * Job Satisfaction (Satisfied)    |   |                      | 0.059<br>(4.090)      |
| Treatment * Pay Type (Hourly)               |   |                      | 2.716<br>(2.645)      |
| Constant                                    | 102.368***<br>(0.631)                   | 99.251***<br>(2.729) | 101.586***<br>(3.519) |
| Observations                                | 304                                     | 304                  | 304                   |
| R <sup>2</sup>                              | 0.012                                   | 0.043                | 0.060                 |
| Adjusted R <sup>2</sup>                     | 0.009                                   | 0.017                | 0.011                 |

*Note:*

Bonferroni-corrected p-values: \*p<0.0019; \*\*p<9e-04; \*\*\*p<2e-04

Table 3 presents an overview of the multiple regression model for the treatment effect, where a Bonferroni correction has been applied to the significance level to address concerns about false positives due to multiple comparisons when conducting multiple hypothesis tests. After applying the correction, no significant

coefficients are observed, indicating that our prior multivariate results in Table 1 should be interpreted with caution.

## 4 Conclusion

Our findings ultimately indicate that when survey participants were offered a four-day workweek, their reduction difference of 2% in percentage of acceptable salary was not statistically significant at the 95% confidence level and not large enough to carry any practical significance for organizational use. As a result, our study finds no meaningful causal effect on the minimum accepted percentage of salary when moving to a four-day workweek from a five-day workweek. After conducting the analysis, the team speculated on reasons as to why there was no substantial treatment effect. Some major themes emerged from this discussion, the first being the current economic state of the United States, which recently came out of a period of high inflation and the persistently increasing cost of living. We also observe that the average minimum acceptable percentage of current salary for the control group was 102.3684% of their current salary, while the treatment group was 100.296%. This observation led the team to speculate that the survey sample in general may feel underpaid, leading to overall lower interest in taking any job that offers less pay, regardless of if there is a reduction in hours. There is also a possibility of selection bias, as we found the median household income from our study was \$49,000 while the median household income in the United States is \$74,580<sup>3</sup>. This may indicate that our sample of survey respondents represents a lower-income demographic and thus the results may not be generalizable to the entire US population. Lastly, we realized that in a survey study with no supervision and with no actual consequences for their decisions, participants have no incentive to answer truthfully or with absolute certainty. This issue was observed in our pilot study and was partially addressed, but our controls had their limitations. These hypotheses begin to tell a story as to why we observed the results we did in this specific experiment and their implications to generalizability; however, these assessments would need to be confirmed with additional research.

The findings in this study may be useful for corporations in the United States that are investigating the introduction of a four-day workweek in their own organizations as it could help provide evidence that individuals in this demographic would not be interested in accepting less pay to work fewer hours. However, these findings may also provide motivation to expand the research, focusing on other benefits that corporations may realize such as reduced turnover, decreased employee stress, and less unplanned paid time off, all of which are crucial for an organization's operational stability.

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<sup>3</sup>Median Household Income in April 2024. "Talk Markets" Retrieved from <https://talkmarkets.com/content/economics-politics/median-household-income-in-april-2024?post=448785>

## 5 Appendix

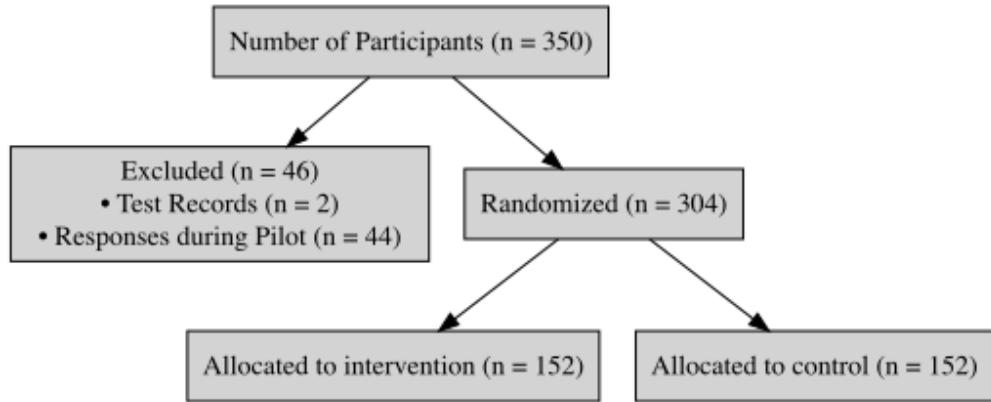


Figure 1: CONSORT Flow Diagram



Figure 2: Preview to the Survey.

\***Scenario:** You are actively applying for a new job that is the same role as your current position.

**Question:** Given the annual salary you indicated in the previous question, what is the minimum annual salary you would accept if the job offered a 1-day reduction in weekly work hours, resulting in a 4-day work week instead of a traditional 5-day work week?

*Please note: Salary options varies according to a percentage of previously indicated salary.*

- \$110000/yr (110%)
- \$105000/yr (105%)

Figure 3: Preview to the Treatment Question

\***Scenario:** You are actively applying for a new job that is the same role as your current position.

**Question:** Given the annual salary you indicated in the previous question, what is the minimum annual salary you would accept if the job offered a 5-day work week?

*Please note: Salary options varies according to a percentage of previously indicated salary.*

- \$110000/yr (110%)
- \$105000/yr (105%)

Figure 4: Preview to the Control Question

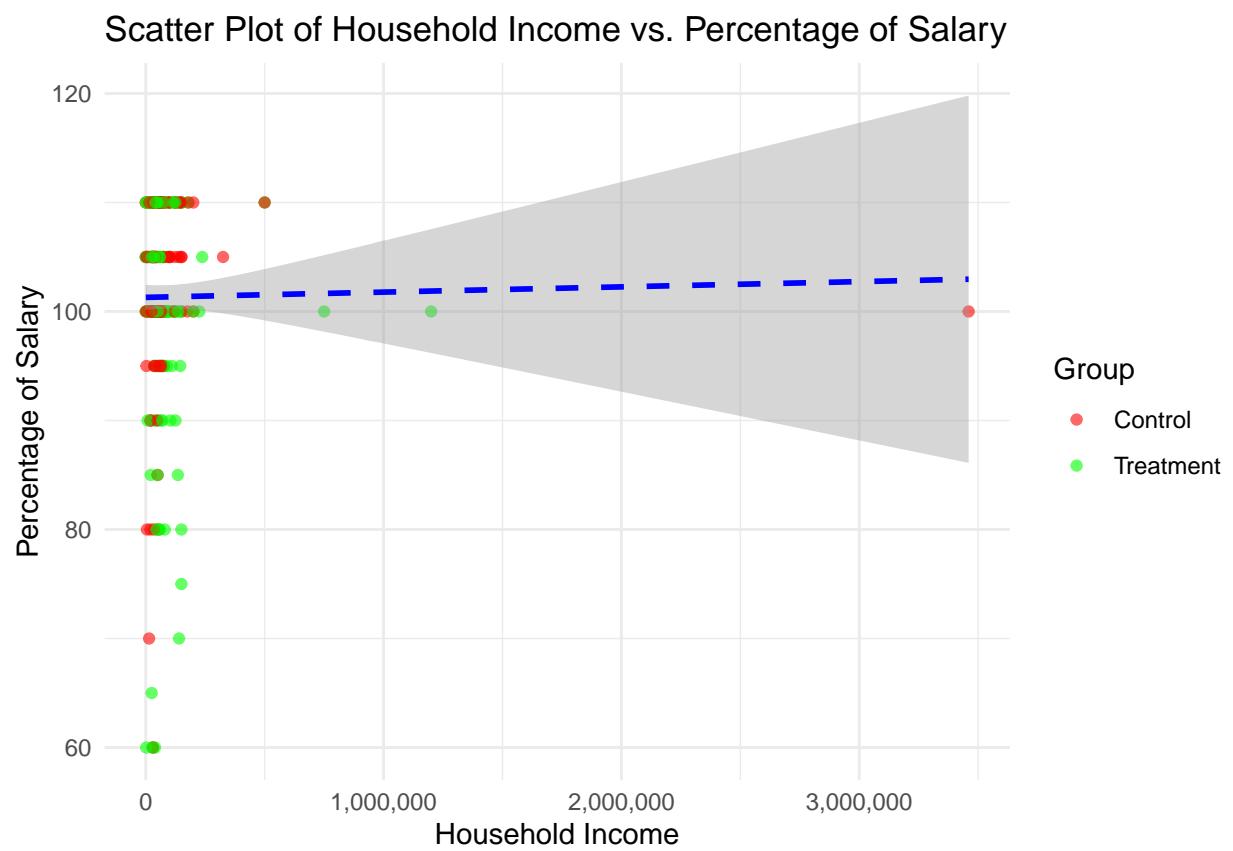


Figure 5: Scatter Plot of Household Income vs. Percentage of Salary