

Using the Wilcoxon rank-sum test (also known as the Mann-Whitney U test) for comparing independent samples. This test does not assume normality and is applicable to ordinal or continuous data. 4 tests are being run by the following code.

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In [1]: import pandas as pd
from scipy.stats import mannwhitneyu

# Load your data
file_path = r'C:\Users\adiit\OneDrive\Desktop\Prob_dictator data.xlsx'
df = pd.read_excel(file_path)

# Drop rows with missing values
df = df.dropna()

# Define the pairs of interest
pairs = [
    ('high social dist_cheat', 'high social dist_no_cheat'),
    ('low social dist_cheat', 'low social dist_no_cheat'),
    ('high social dist_cheat', 'low social dist_cheat'),
    ('high social dist_no_cheat', 'low social dist_no_cheat')
]

# Set the significance level (alpha)
alpha = 0.05

# Perform Wilcoxon rank-sum tests
for pair in pairs:
    group1 = df[pair[0]]
    group2 = df[pair[1]]

    # Perform Wilcoxon rank-sum test
    statistic, p_value = mannwhitneyu(group1, group2, alternative='two-sided')

    print(f'Wilcoxon rank-sum test for {pair[0]} and {pair[1]}:')
    print(f'Statistic: {statistic}, p-value: {p_value}')

    # Check significance based on the chosen alpha level
    if p_value < alpha:
        print('Result: Reject the null hypothesis (significant difference)
\n')
    else:
        print('Result: Fail to reject the null hypothesis (no significant difference)\n')
```

Wilcoxon rank-sum test for high social dist_cheat and high social dist_no_cheat:

Statistic: 2043.0, p-value: 0.49756019485269154

Result: Fail to reject the null hypothesis (no significant difference)

Wilcoxon rank-sum test for low social dist_cheat and low social dist_no_cheat:

Statistic: 2156.5, p-value: 0.9179990447668643

Result: Fail to reject the null hypothesis (no significant difference)

Wilcoxon rank-sum test for high social dist_cheat and low social dist_cheat:

Statistic: 2016.5, p-value: 0.42272392069475984

Result: Fail to reject the null hypothesis (no significant difference)

Wilcoxon rank-sum test for high social dist_no_cheat and low social dist_no_cheat:

Statistic: 2145.5, p-value: 0.8740023634446603

Result: Fail to reject the null hypothesis (no significant difference)

The results of the Wilcoxon rank-sum tests for each pair indicate that, in each case, there is no statistically significant difference between the two groups based on the chosen alpha level of 0.05. Here's the interpretation for each pair:

High Social Dist_Cheat vs. High Social Dist_No_Cheat:

- Statistic: 2043.0
- p-value: 0.49756019485269154
- Result: Fail to reject the null hypothesis (no significant difference)
- Interpretation: There is no significant difference in the distribution of values between high social distance cheating and non-cheating scenarios.

Low Social Dist_Cheat vs. Low Social Dist_No_Cheat:

- Statistic: 2156.5
- p-value: 0.9179990447668643
- Result: Fail to reject the null hypothesis (no significant difference)
- Interpretation: There is no significant difference in the distribution of values between low social distance cheating and non-cheating scenarios.

High Social Dist_Cheat vs. Low Social Dist_Cheat:

- Statistic: 2016.5
- p-value: 0.42272392069475984
- Result: Fail to reject the null hypothesis (no significant difference)
- Interpretation: There is no significant difference in the distribution of values between high social distance cheating and low social distance cheating scenarios.

High Social Dist_No_Cheat vs. Low Social Dist_No_Cheat:

- Statistic: 2145.5
- p-value: 0.8740023634446603
- Result: Fail to reject the null hypothesis (no significant difference)
- Interpretation: There is no significant difference in the distribution of values between high social distance non-cheating and low social distance non-cheating scenarios.

In summary, based on the Wilcoxon rank-sum tests, there is no evidence to suggest a significant difference in the distribution of values between the different social distance and cheating scenarios in our probabilistic dictator game.