**Proposal 1: The relationship between social connection and happiness**

Research question: How does social connection index affect an individual's overall sense of happiness?

1. Definition of variables

Independent variable: Social connection index.

Definition: The social connection index is a comprehensive indicator that measures the frequency of an individual's interactions and communication with others in daily life. Specific variables may include: Frequency of contact with friends: a measure of the number of times a person communicates or meets with friends. Interaction with family members: the frequency with which an individual keeps in touch with family members. Interaction with work colleagues: whether the individual frequently communicates or interacts with colleagues outside of work.

Dependent variable: Happiness score or life satisfaction score, measuring an individual's subjective level of happiness.

Definition: This is a subjective measure used to gauge an individual's overall level of happiness or satisfaction with life. Questionnaires may be used to measure this factor in data, such as "How happy did you feel in the past week?" Scores may range from 1 to 10, with 1 representing extreme unhappiness and 10 representing very high levels of happiness.

2. Methodology

Method: Perform a simple linear regression analysis to explore the impact of social connection index on happiness score.

Assumption: Individuals with higher social connection index are expected to have higher average happiness score.

3. Visualization recommendations

Scatter plot: showing the relationship between social connection index and happiness score.

Explanation: Scatter plots are helpful for visualizing the correlation between variables and identifying trends or outliers.

4. Correlation and Potential Outcomes

Possible Outcomes: It is expected that the Social Connection Index will show a positive correlation with happiness.

Correlation: This will support research on the role of social connection in individual health and happiness, and help provide data support for future social campaigns and intervention measures.

**Proposal 2: Social Connection Differences Between Different Populations**

Research Question: Are there significant differences in social connection levels between different age groups and genders?

1. Variable Definition

Independent variable: demographic variables such as age and gender.

Definition: These variables are used to define different groups and help us understand the differences between specific populations. Common variables include:

Age: Usually numerical data, which may be divided into different age groups according to needs (e.g. 18-25 years old, 26-35 years old, etc.).

Gender: Usually categorical variable used to distinguish between males, females, and non-binary individuals in the data.

Residence: Can be different types of living environments such as big cities, small towns, and rural areas.

Dependent variable: Social Connection Index.

Definition: Same as mentioned in Analysis 1, used to measure the intensity of people's social connections.

2. Analysis Method

Method: Use ANOVA to analyze the social connection index among different groups.

Assumption: Different age groups and genders will show significant differences in social connection index.

3. Visualization recommendations

Box plot: shows the difference in social connection index among different age groups and genders.

Explanation: A box plot can clearly display the median and distribution differences among groups.

4. Correlation and Potential Outcomes

Potential Outcomes: It may be found that there is a difference in the frequency of social connection between young and old people.

Correlation: This analysis helps identify specific groups that require social support, thereby enabling the development of targeted community programs.

**Proposal 3: The Relationship Between Social Connection and Stress Levels**

Research Question: How does the level of social connection affect an individual's stress levels?

1. Variable Definition

Independent variable: Social Connection Index.

Definition: The same social connection measurement criteria used in the previous analysis may be used, which may include specific types of interaction frequency and quality.

Dependent variable: Reported stress level.

Definition: This variable measure the psychological stress level experienced by an individual over a certain period of time. Data may include survey questions used to reflect stress, such as "How much stress have you felt in the past month?" Scores may range from 1 (no stress) to 10 (extreme stress).

2. Method of Analysis

Method: Conduct a correlation analysis to determine the relationship between social connection and stress level.

Assumption: Higher levels of social connection are expected to be associated with lower stress levels.

3. Visualization Recommendations

Scatter Plot and Regression Line: Showing the relationship between social connection and stress level.

Explanation: This chart provides a clear visual representation of the linear relationship between variables, making it easy to analyze trends.

4. Correlation and Potential Outcomes

Possible Outcomes: It is expected that the study will find a negative correlation between social connection and stress levels.

Correlation: Supporting the theory that social connection is a key factor in alleviating psychological stress, this correlation provides strong evidence for the project's public health objectives.