

Research question1:

What's the relationship between the importance of social engagement and different age groups?

Variables to explore:

1. Age groups: We want to explore different age groups that might need different levels of social engagement, so we need to divide participants into different age groups.
2. The importance of social engagement: Participants may need less or more social engagement based on different ages.

How to explore them:

A grouped bar chart is useful to visualize the relationship as it could provide a clear comparison between different age groups that fall into different levels of importance. The age will be categorized into different groups, like teenagers (13-18), adults (19-59), and elderly (60+). The importance of social engagement will be divided into three levels including low, medium, and high. Every age group has a bar for every level of importance, showing the count in each group.

Analysis:

Method: One-way analysis of variance:

How to perform:

1. Make sure the data of age groups and the level of importance of social engagement are categorized.
2. Calculate the median, mean, and standard deviation of the level of importance for every age group.
3. Perform the one-way analysis of variance to compare the mean levels across age groups as there is only one independent variable (age groups), testing if there is a significant difference in the importance among the age groups.
4. If the difference is significant, use a post-hoc test to identify specific age group differences.

Hypothesis:

Possible results: The level of importance of social engagement will be different significantly due to different ages. The older age groups value social engagement more than younger age groups. This is because the elderly value social connection more than the younger because of factors like more free time, fewer activities, and friends.

Relevance to the research question: If there is a significant difference shown in the result, it shows age is an important factor that influences individuals' value on the importance of community engagement. In this case, researchers could design different community programs based on different age groups.

Research question2:

Is it always true that more frequent social contact is better for personal mental health?

Variables to explore:

1. The frequency of social contact: To explore the question, we need to compare the impact of different frequencies of social contact on individuals' mental health.
2. The score of mental health: The score is used to the changes in the level of personal mental health due to different frequencies of social contact.

How to explore them:

A scatter plot is helpful to reflect if there is always a positive trend. The range of the score of mental health may vary from 0 to 10. The frequency of social contact will be categorized into "rarely", "sometimes", "often", and "more often". The frequency of social contact will be on the x-axis and the score of mental health will be on the y-axis, helping us observe if more frequent social contact means a higher mental health score.

Analysis:

Method: Linear Regression

How to perform:

1. Set up the data: the level of frequency of social contact could be demonstrated with numbers like 1 representing "rarely", and 2 representing "sometimes" The level of frequency of social contact is on the x-axis and the score of mental health is on the y-axis.
2. Assume the linear plot through the scatter plot.

3. Add a constant to the independent variable (the frequency of social contact) as the intercept.
4. Run the linear regression.
5. Observe the slope to see how the score changes with frequency of social contact, p-value to see how significant is the relationship between the frequency of social contact and personal mental health.

Hypothesis:

Possible results: Generally, more frequent social contact is associated with better higher score of mental health, with an ascending linear line. However, the line may descend when the frequency is extremely high due to less time to self-reflect and social exhaustion.

Relevance to the research question: If there is a point that the higher frequency will no longer provide benefit to mental health even having a decreasing line, it shows it is false that the higher frequency of social contact always positively influences mental health. In this case, it is suggested that social interaction should be within a certain frequency instead of “more is better”.

Research question3:

Does social interaction have different impacts on individuals' well-being with different gender (men, women)?

Variables to explore:

1. The frequency of social interaction: We need to compare differences between different genders' well-being situations through the different frequencies of social interaction, since there may be bias if only one level of frequency is explored.
2. The score of well-being: An individual's well-being score may vary due to different frequency of social interaction and different gender.
3. Gender: We aim to explore if different genders cause different individual well-being scores under a certain frequency of social interaction.

How to explore: A box plot is useful to explore the variables to compare the distribution of scores of well-being across different levels of social interaction for each gender. Through this plot, central tendency, outliers, and spread for each gender are provided, helping us to see if there are differences across different genders.

Analysis:

Method: Two-way analysis of variation (because there are two independent variables: the frequency of social interaction and gender)

How to perform:

1. Set up the data including values of well-being scores, the frequency of social interaction, and gender. The range of well-being scores will vary from 0 to 10. The level of social interaction frequency will be categorized into rarely, sometimes, often, and very often. The gender will be divided into male and female.
2. Run two-way analysis with a dependent variable (well-being score) and independent variables (gender and social interaction frequency). It will test social interaction frequency's effect on personal well-being, gender's effect on well-being, and the interaction effect between social interaction and gender, showing whether the impact of social interaction changes by gender.
3. If the difference is significant, conduct post-hoc tests to identify the differences.

Hypothesis:

Possible results: A higher frequency of social interaction to correlate positively with well-being is expected for one gender than another. Under a certain social interaction frequency, there are different well-being scores between different genders. This is because males and females stand in different positions in the community, thus, they have different needs for social interaction.

Relevance to the research question: If the social interaction frequency that affects individuals' well-being for one gender is stronger than another one, it indicates that social interaction has different influences on personal well-being for each gender.