Individual Course Project Proposals

Purpose: help raise awareness about and interest in this often underappreciated topic

Proposal 1: Impact of Social connections on Mental Health

Research Question: Is there a relationship between the level of social connections Canadians have and the reported mental health among Canadians?

Variables to take into account:

- Wellness (Mental Health) Self Rating: categorical variable, that will be used as the measure that will allow me to assess how wellness rating can vary among the social connection levels, will potentially be measured in scale going from bad, medium and good, can be visualized through a box plot.
- Social Connection Score: quantitative variable (numerical) that will show the among of interactions Canadians have, it is independent and will be also measured in a scale going from little, regular or great, and can be visualized with a bar chart.

The visualization for the suggested variables could be done either by a box plot of the wellness scores by social connection categories, more specifically, categories like: little, rarely regular, great social connections. This would be helpful to be able to identify if there are patterns in wellness across the different social connection scores. An alternate visualization would be to use a bar chart in which the distribution of wellness across different levels of social connection are shown, which again would provide a clear comparison of both variables.

Hypothesis:

- Null (H0): There is no difference in wellness self rating across the different social connection scores
- Alternate (HA): Higher social connection scores are associated with higher wellness self rating scores

Analysis: use a one way analysis of variance to determine if there is any statistical relevant difference between the wellness ratings and social connections scores. In order to complete this HT, use bootstrapping to evaluate the reliability of the observed differences. Then, set a predetermined significance value, and If the p-value from this analysis is below the significance level then reject the null hypothesis and conclude that there is enough evidence to do so. This analysis method is used because it has been seen in class that it is really effective when analyzing variation across different categories.

Possible results: after performing the analysis, there could be a significant difference in wellness scores among the different scores of social connections, which would show evidence that supports the claim that higher connectivity levels are able to significantly influence the mental health sense of canadians. Additionally, bootstrapped 95% confidence intervals would be supporting the results, which would ensure validity of these to generalize them.

Relevance to the prompt and purpose: results would directly support or challenge the idea that social connections have a crucial role on Canadians mental health, and thus incentivize Canadians to create, develop, improve and maintain social connections (hopefully) as much

as they can, since by doing so they would be helping themselves to have a better sense of wellness. Moreover, the results generated from this analysis could also help programs or organizations supporting and trying to improve mental health across Canada to target their efforts towards social connectivity, and perhaps increase their effectiveness on their campaigns and programs.

Proposal 2: Social Network Size Role on Sense of Loneliness

Research Question: Does the size of a Canadian's Social Network is associated with their feelings of loneliness?

Variables to take into account:

- Social Connections (Network size): numerical variable representing the network size of each observation, which measures the amount of connections, it is independent and it is used to anlyze the impact on the loneliness feelings, it can be visualized through a scatter plot with the social connection as the x-axis and the loneliness score as the y-axis.
- Loneliness score: qualitative and categorical variable that measures the loneliness feeling in low, medium or high, and a histogram can be a visualization method to show how loneliness is distributed among the different network sizes.

Some of the visualization methods I have for this proposal are: a scatter plot of both variables, which can potentially show if there are patterns such as if larger social connection networks are associated with a lower feeling of loneliness; or a histogram of the the loneliness score to various social connections network size, such as the ones proposed in Proposal 1 (low, medium, high), again with the same purpose of identifying if there are patterns and relationships

Hypothesis:

- Null (H0): There is no correlations between the social connection network size and the feeling of loneliness
- Alternate (HA): Bigger social network sizes are associated to lower levels of loneliness

Analysis: to gather evidence for this proposal I would use a linear regression analysis, and I would set the social connections network size to be the independent variable and the loneliness score to be the dependent variable, and sketch a graph with each of the variables in my sample size, and find r to gather evidence and estimations to determine whether the two variables show a strong relation or not. Additionally, I would also find the p-value for my sample in order to support the conclusion made from the linear regression analysis.

Possible results: the expected result for this analysis would be for the variables to have a negative correlation, meaning that the loneliness feeling is lower as the social network size increases, which would then support the alternate hypothesis (reject the null hypothesis) and thus get to the conclusion that the social network size does matter. The linear regression line would be crucial in order to show that the relationship is strong, since each point in the graph would be very close to each other, thus providing reliability. However, there is the possibility

that there is no correlation, which would then fail to reject the null hypothesis and state that there is actually no influence on the loneliness feeling according to how big or small a Canadian's social network is.

Relevance to the prompt and purpose: this analysis is relevant for the purpose of answering the question, because it focuses solely on the two variables used. While it is useful to achieve the purpose of the project because then people would be more knowledgeable on the fact that social network size does matter(hopefully) and be incentivized to socialize more often and increase their network. The findings on this proposal could potentially influence the Canadian government to implement strategies including hosting more social events in communities where loneliness is a great common factor, to later on positively influence people's wellness feeling.

Proposal 3: Does Age have to do with Perceived Social Support ?

Research Question: Does a relationship between the social support perceived and the different group ages in Canada exist?

Variables to take into account:

- Age: divided into different groups such as 18-25, 26-40, 41-65, above 65 yo, categorical and independent variable used to evaluate how the perceived social support varies among different age groups, can be visualized with a box plot with the age groups as the x-axis and the social support as the y-axis.
- Connection Perceived Social Support: qualitative support that can include different areas such as emotional, frequency of the support, etc… , and is the dependent variable, a histogram is a great way to visualize it.

To visualize these variables I would lean towards using either a histogram showing the social support score according to the different age groups set in order to see how the data is distributed and how much the support varies in the different age groups. I will also be open to using a box plot to do the same comparison, but present it in a way in which I can identify the differences of each age group and at the same time obtain relevant statistics such as IQR, mean, median, …

Hypothesis:

- Null (H0): there is no difference in the perceived social support among different age groups in Canada
- Alternate (HA): social support varies among the different age groups in Canada.

Analysis: to analyze this data I would use a two sample analysis of variance to compare the social support scores among the different age groups. Considering I want to learn about both the main effects and interaction effects. I would calculate a 95% confidence interval for the mean social support in each age group in order to obtain the different support levels, and then be able to generate conclusions based on evidence gained.

Possible results: a possible result can be that the groups containing middle aged people perceive a higher social support, whereas older people, such as the ones in the group of 65yo

or above perceive a lower support. However, in order to determine the results I would rely on the 95% confidence intervals to assess the precision of each age group 's social support score.
Relevance to the prompt and purpose: this analysis would be relevant to help to raise awareness in the sense that canadians would become knowledgeable on which age groups are not constantly supported, or at least they feel like it, which could then influence both citizens, organizations and the government to act and implement different ways to show more support to those groups.This is relevant because then it could potentially decrease the vulnerability of certain age groups among Canada, and thus increase the overall social well being.