

THE EFFECTS OF VARIOUS SOCIAL AND EMOTIONAL CONDITIONS TO THE MENTAL WELL-BEING OF A PERSON

Luca Piccone | Ariel Pinaringan | Samario Liu | Narayan Kitas Utama

STA130 Final Project

Introduction

This study explores the impact of social and emotional factors on mental well-being, focusing on subjective happiness, loneliness, and depression. By examining the influence of social barriers like shyness and friendships, the effects of social media usage on loneliness, and the role of emotional stability and social support in depression, the research aims to better understand how these conditions interact to shape an individual's mental health. The findings highlight the complexity of these relationships and suggest the need for further research to fully grasp the long-term effects and underlying mechanisms.



Research Question 1

How do social barriers like shyness and the number of close friendships interact to influence subjective happiness?



Research Question 2

Does higher daily social media usage reduce existential loneliness compared to lower usage?



Research Question 3

The effect of emotional stability and social support on extent of depression

Research Question 1

How do social barriers like shyness and the number of close friendships interact to influence subjective happiness?

Introduction

We use regression to explore how shyness and number of close friends relate to happiness. This approach handles both continuous and binary variables, showing clear patterns in the data.

However, we acknowledge that this method shows correlation, not causation, and may be influenced by unmeasured factors like personality or life circumstances.



01

Happiness Scores

02

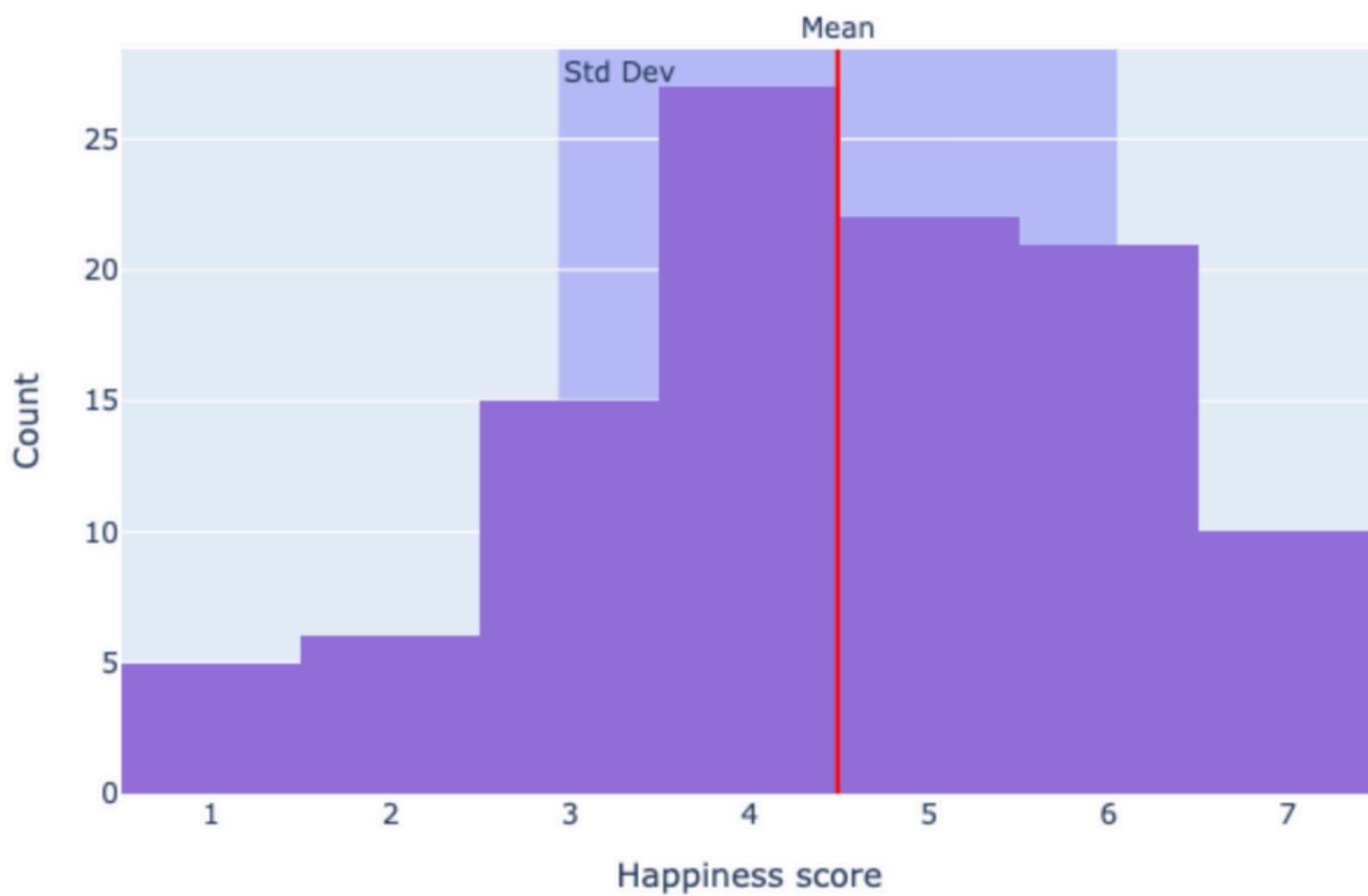
Number of Friends

03

Shy

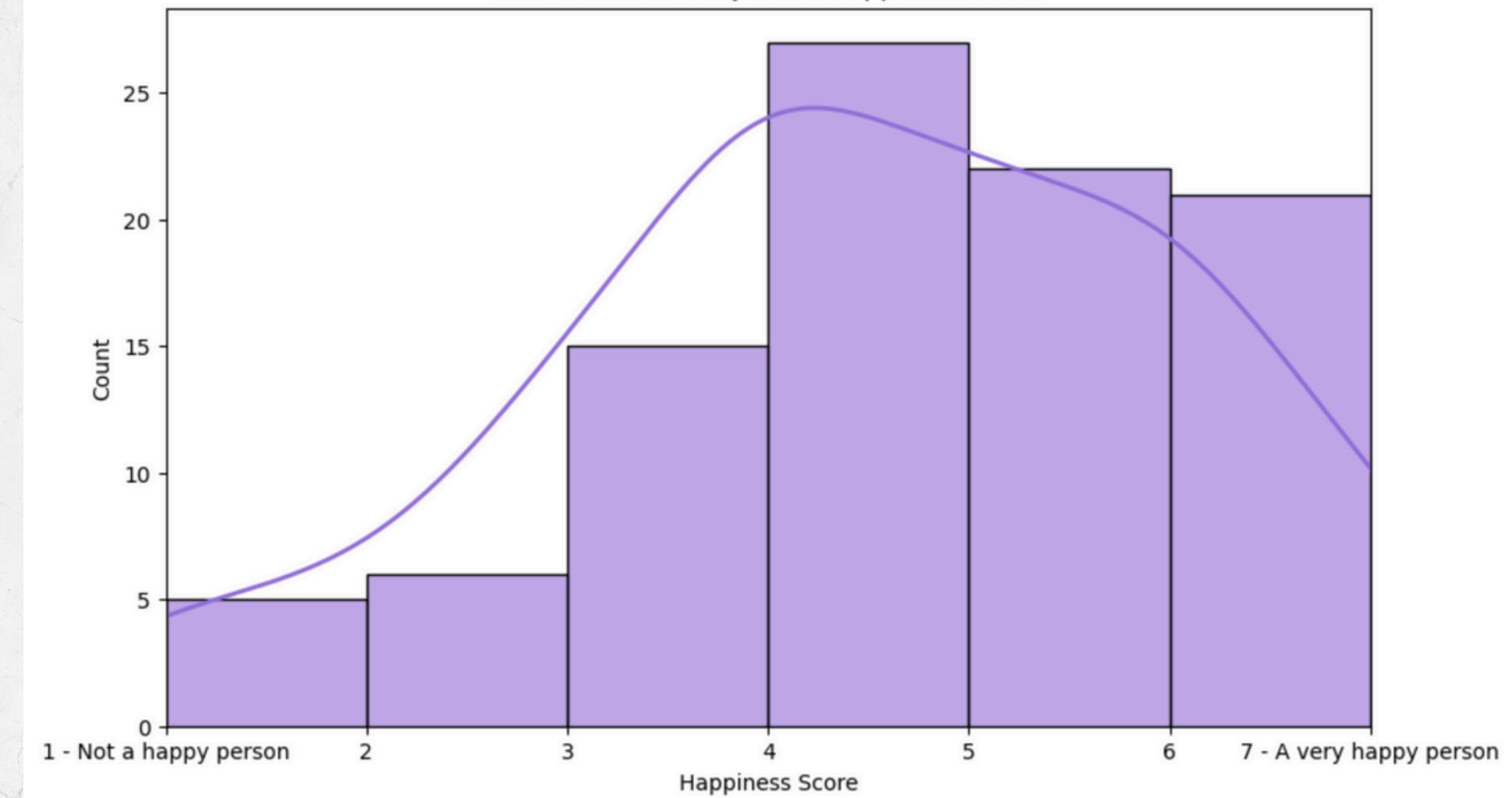
Visualization: Happiness Score

Distribution of Subjective Happiness Scale



Histogram of happiness scores

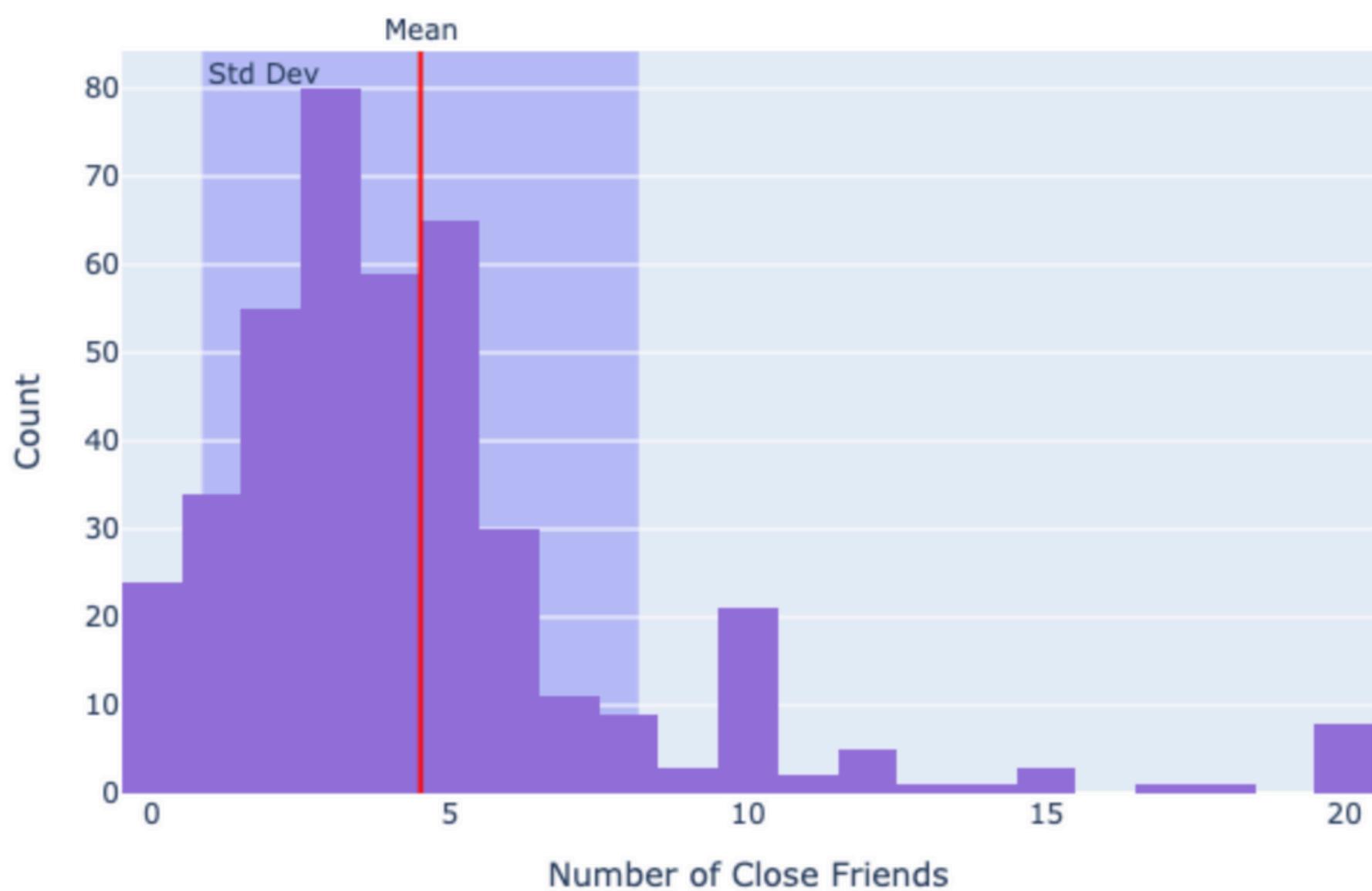
Distribution of Subjective Happiness Score



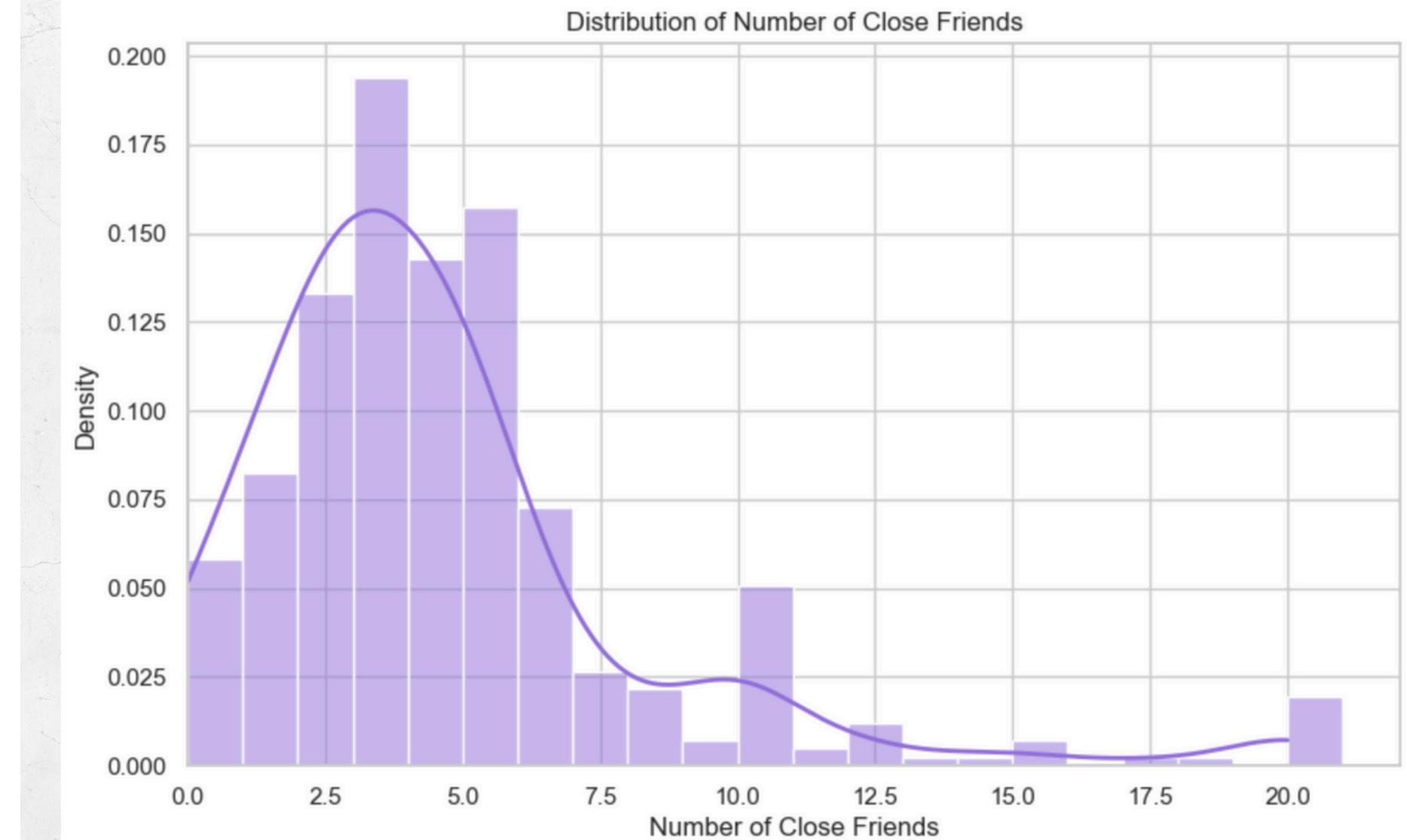
Histogram and kde of happiness scores

Visualization: Number of Close Friend

Distribution of Number of Close Friends

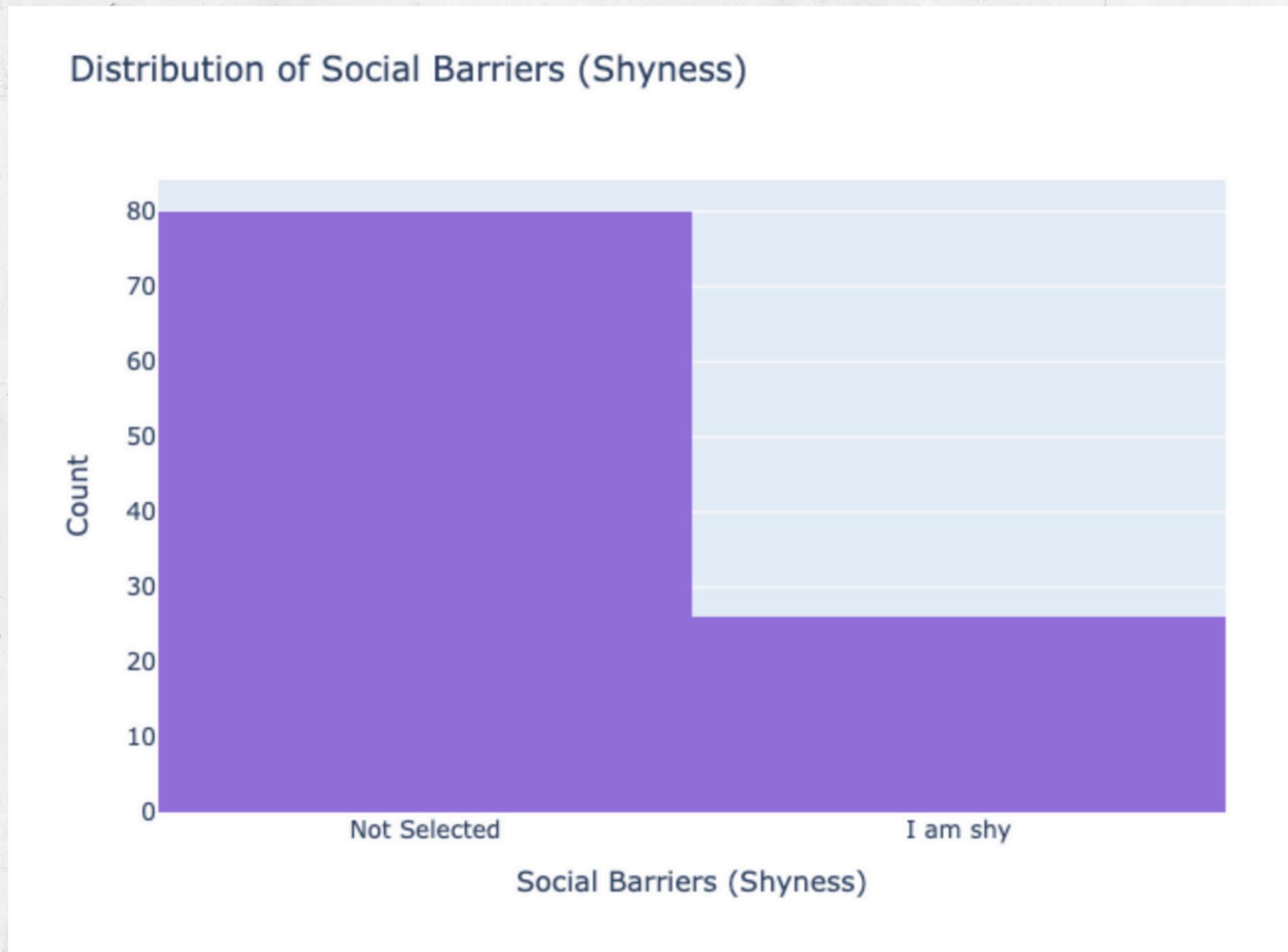


Histogram of the number of close friends



Histogram and KDE for number of close friends

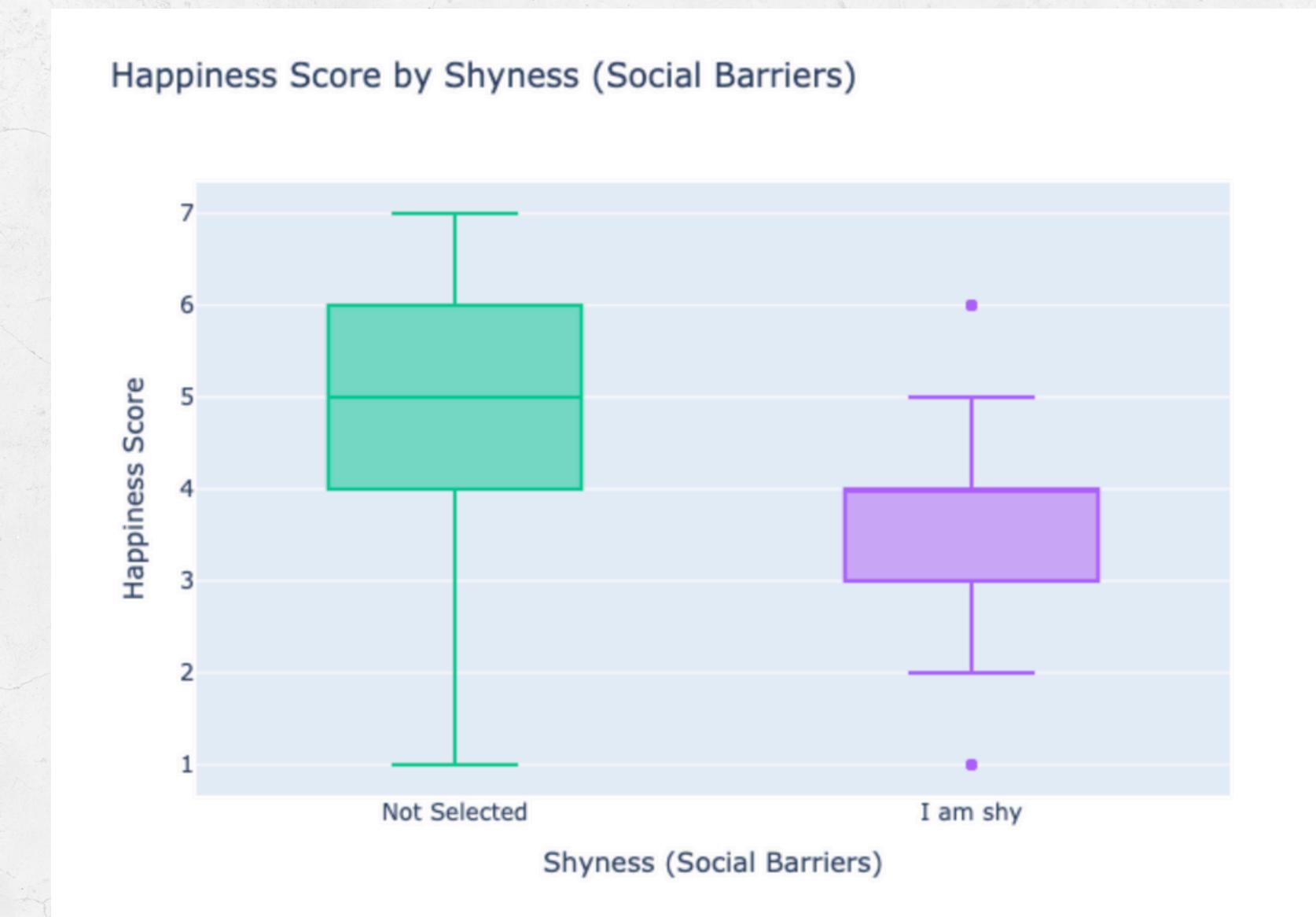
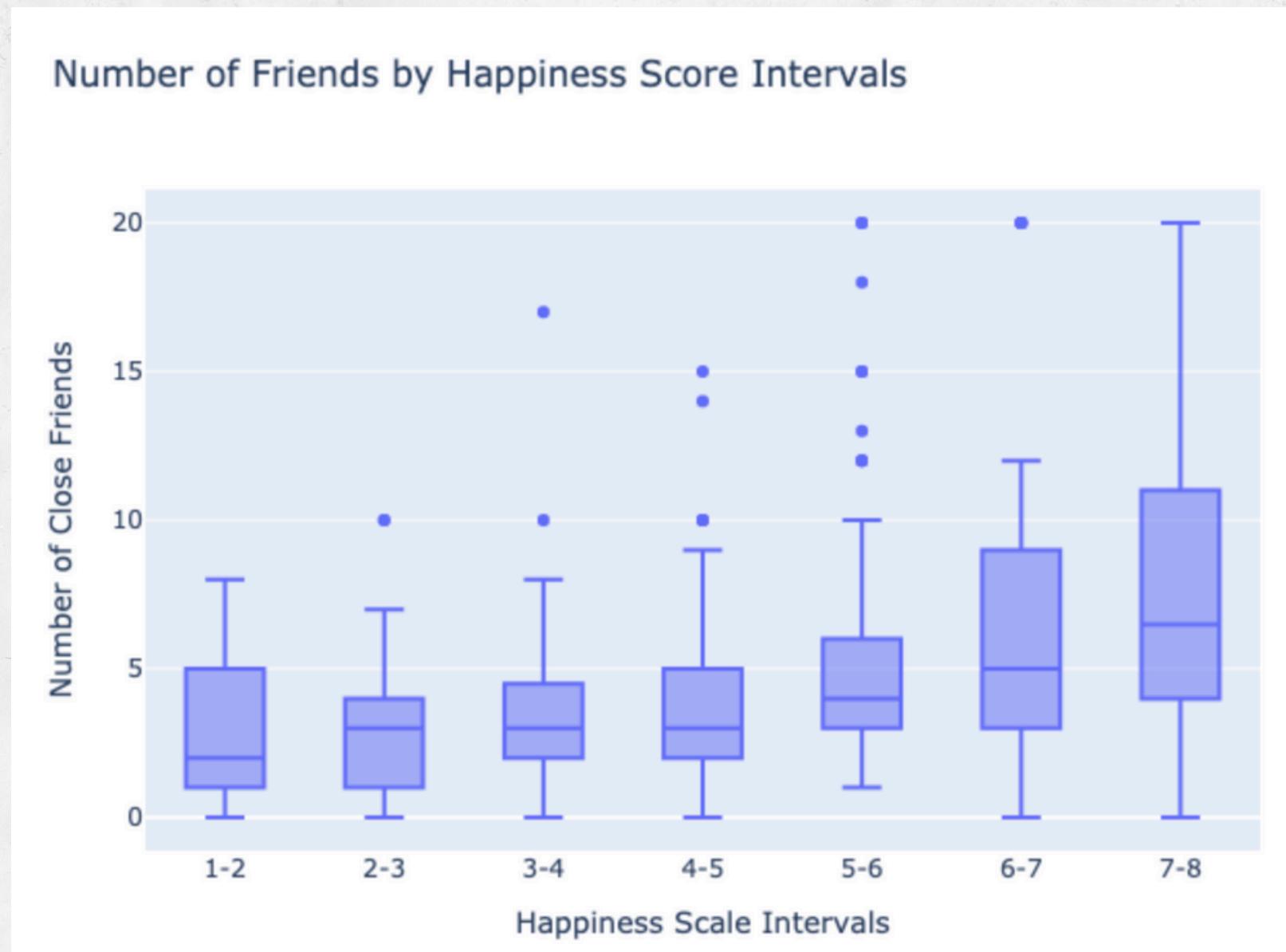
Analysis & Visualization



**Number of shy people in the dataset versus non shy.
(Histogram)**



Analysis & Visualization



Analysis & Visualization



OLS Regression Results

Dep. Variable:	WELLNESS_subjective_happiness_scale_score	R-squared:	0.106			
Model:	OLS	Adj. R-squared:	0.104			
Method:	Least Squares	F-statistic:	48.96			
Date:	Thu, 28 Nov 2024	Prob (F-statistic):	1.07e-11			
Time:	19:04:02	Log-Likelihood:	-696.83			
No. Observations:	413	AIC:	1398.			
Df Residuals:	411	BIC:	1406.			
Df Model:	1					
Covariance Type:	nonrobust					
	coef	std err	t	P> t	[0.025	0.975]
const	3.8840	0.102	37.947	0.000	3.683	4.085
CONNECTION_social_num_close_friends	0.1235	0.018	6.997	0.000	0.089	0.158
Omnibus:	8.620	Durbin-Watson:	1.774			
Prob(Omnibus):	0.013	Jarque-Bera (JB):	8.736			
Skew:	-0.333	Prob(JB):	0.0127			
Kurtosis:	2.748	Cond. No.	9.37			
Notes:	[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.					

Summary tables of the linear regression

Analysis & Visualization

[63]:

OLS Regression Results

Dep. Variable:	Q('WELLNESS_subjective_happiness_scale_score')	R-squared:	0.165
Model:	OLS	Adj. R-squared:	0.161
Method:	Least Squares	F-statistic:	40.41
Date:	Thu, 28 Nov 2024	Prob (F-statistic):	9.62e-17
Time:	19:07:05	Log-Likelihood:	-682.92
No. Observations:	413	AIC:	1372.
Df Residuals:	410	BIC:	1384.
Df Model:	2		
Covariance Type:	nonrobust		

coef std err t P>|t| [0.025 0.975]

Intercept	3.3537	0.140	23.916	0.000	3.078	3.629
CONNECTION_social_barriers_shy[T.Not Selected]	0.7817	0.146	5.345	0.000	0.494	1.069
CONNECTION_social_num_close_friends	0.1105	0.017	6.407	0.000	0.077	0.144

Omnibus: 7.231 Durbin-Watson: 1.777

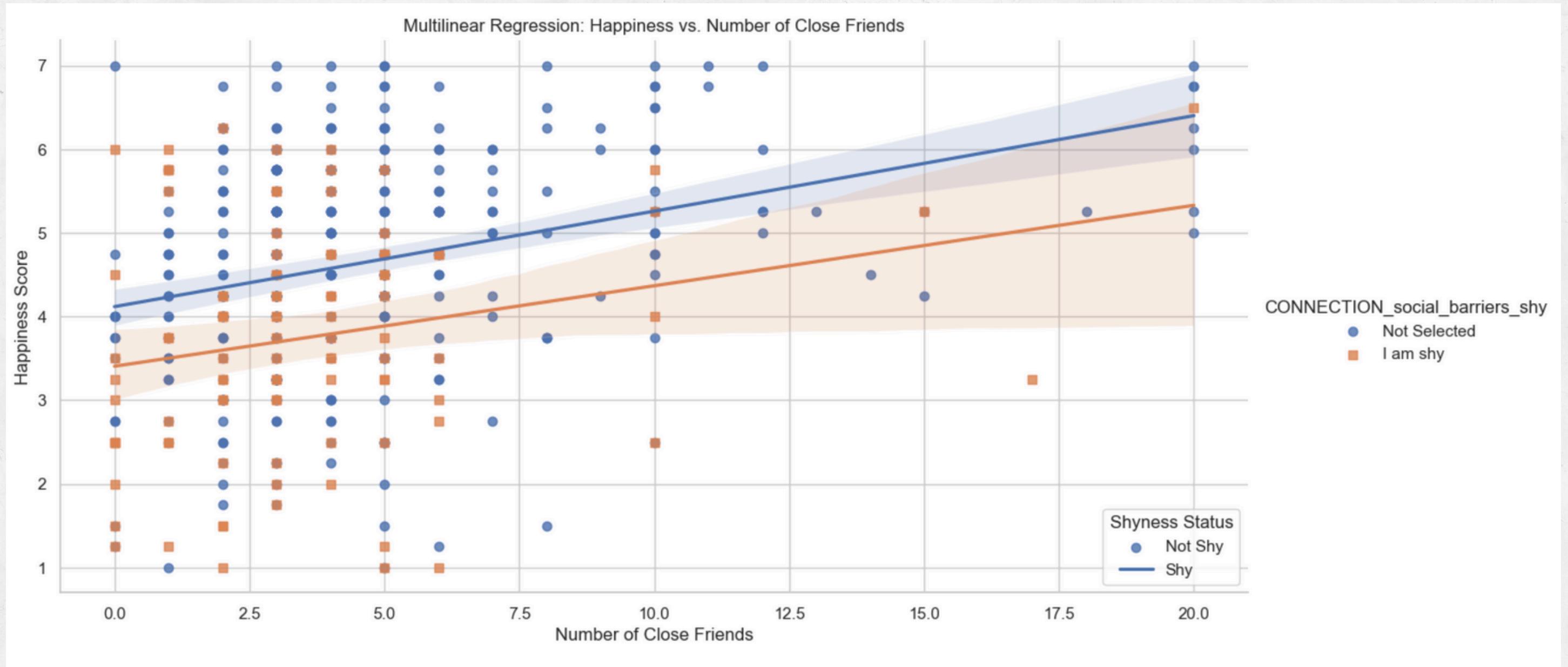
Prob(Omnibus): 0.027 Jarque-Bera (JB): 7.406

Skew: -0.314 Prob(JB): 0.0246

Kurtosis: 2.807 Cond. No. 17.7

Summary tables of the linear regression

Analysis & Visualization

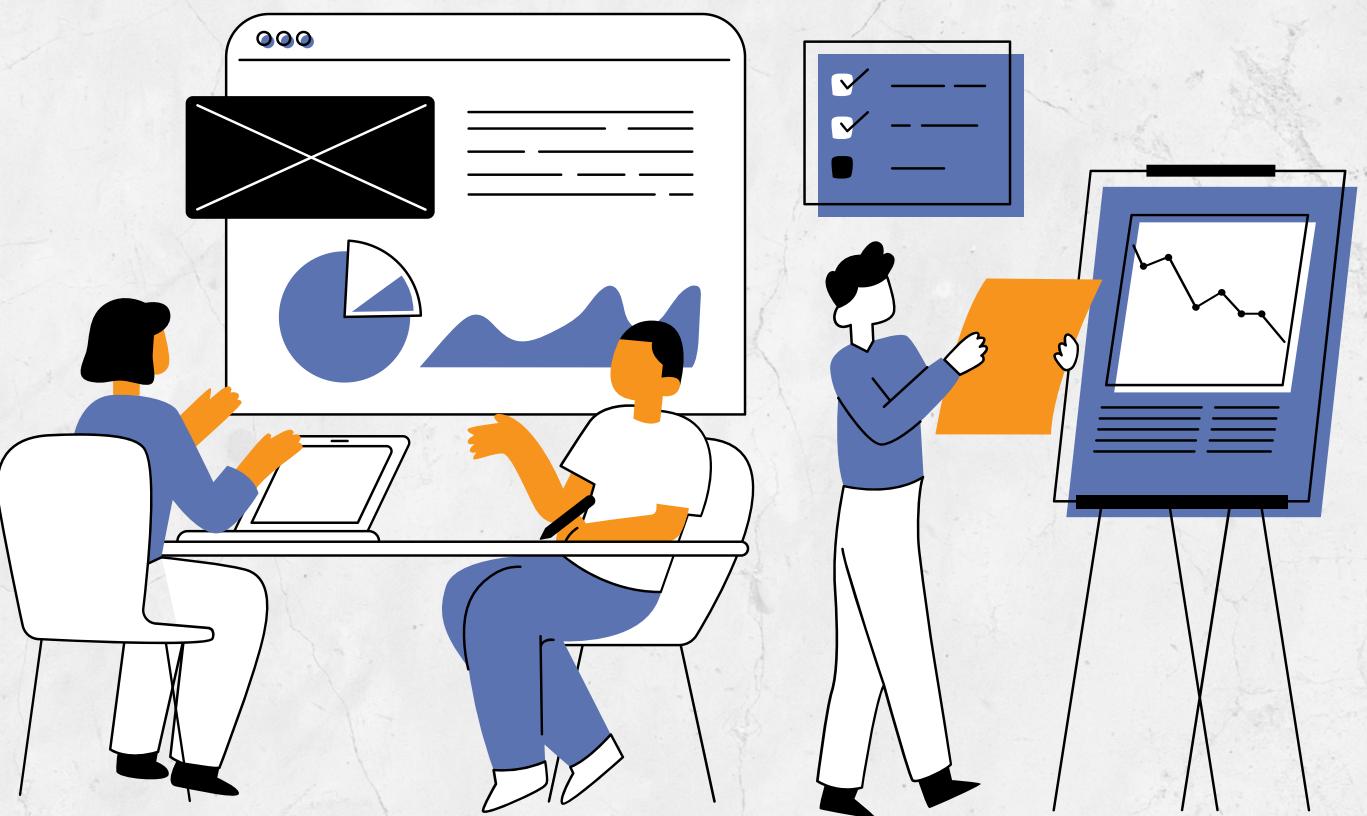


Conclusion & Limitations

Reject the null

Low R² value

Low coefficients



Research Question 2

Does higher daily social media usage reduce an individual's loneliness score compared to lower usage?

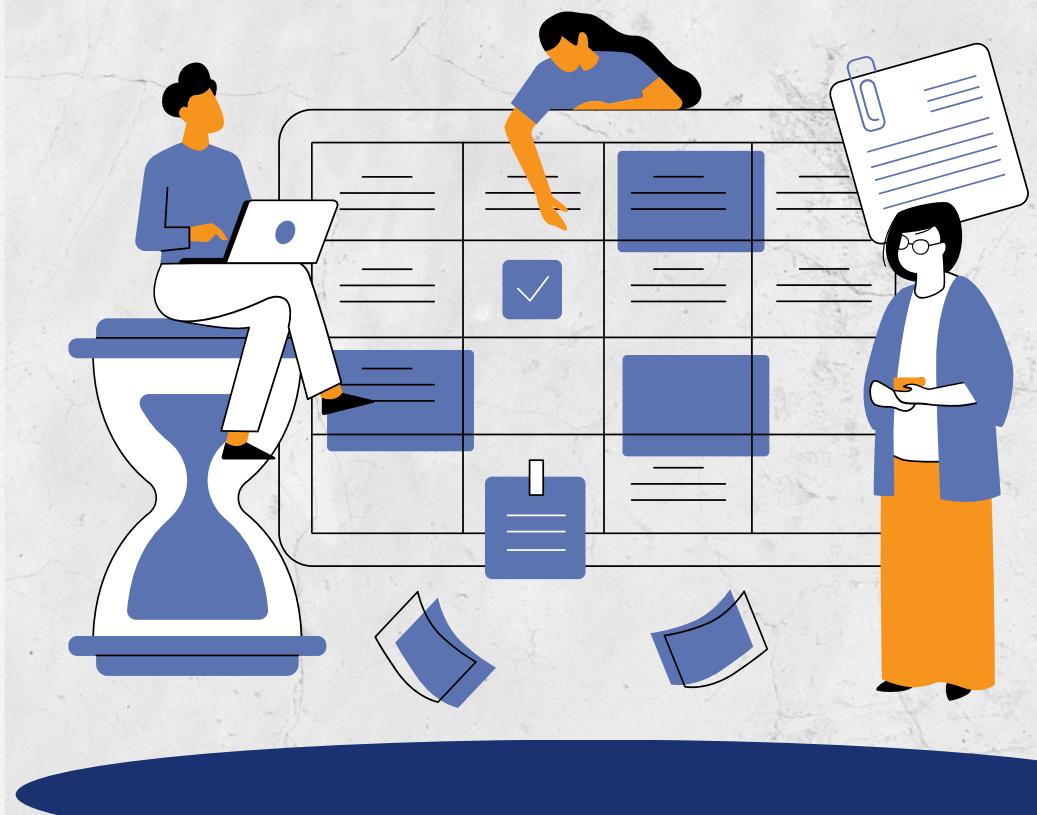
Introduction

Nowadays, almost everyone uses social media. And we know that it plays a significant role in shaping social interactions today. While it connects people virtually, does having social interactions virtually on social media longer make us less lonely?

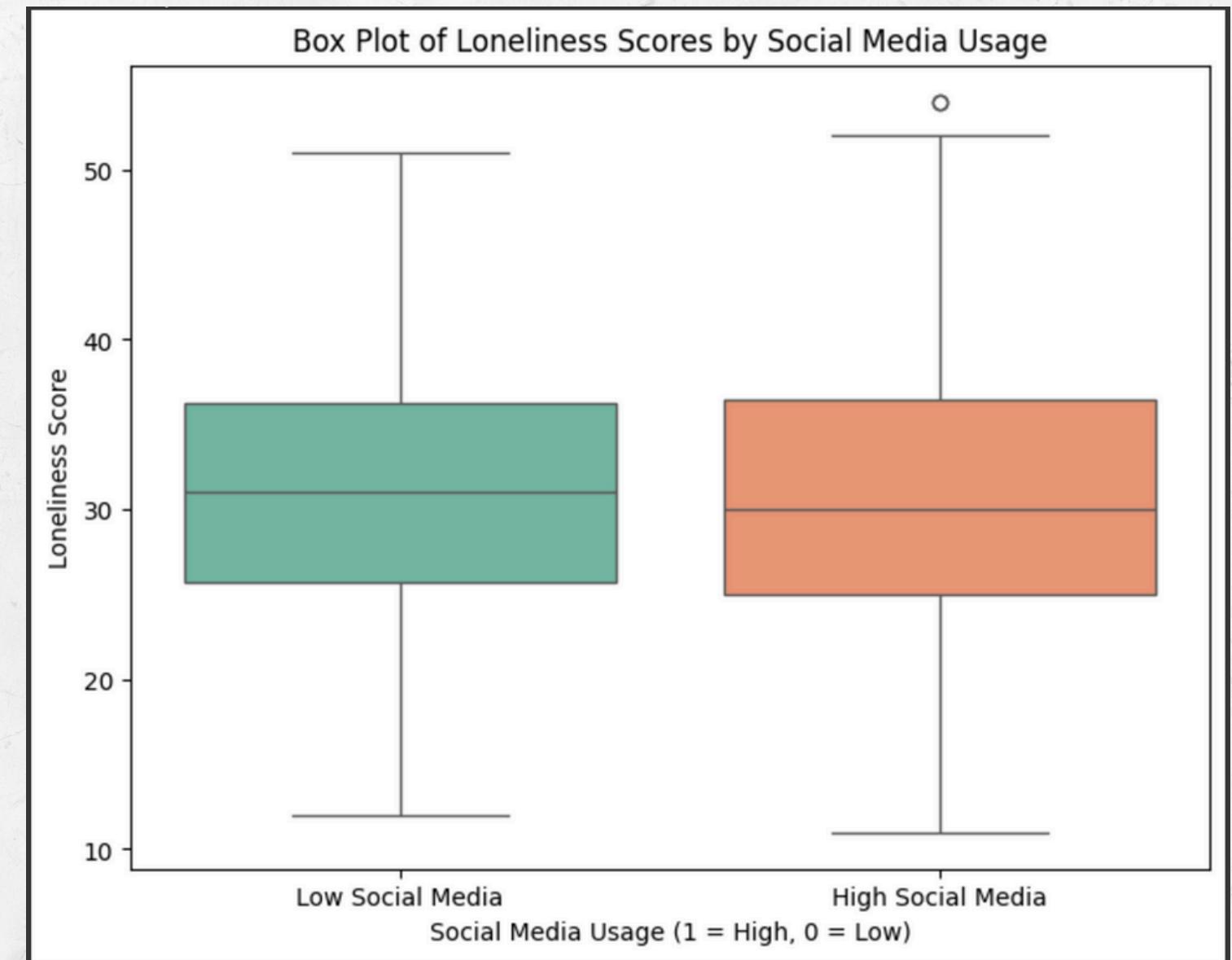
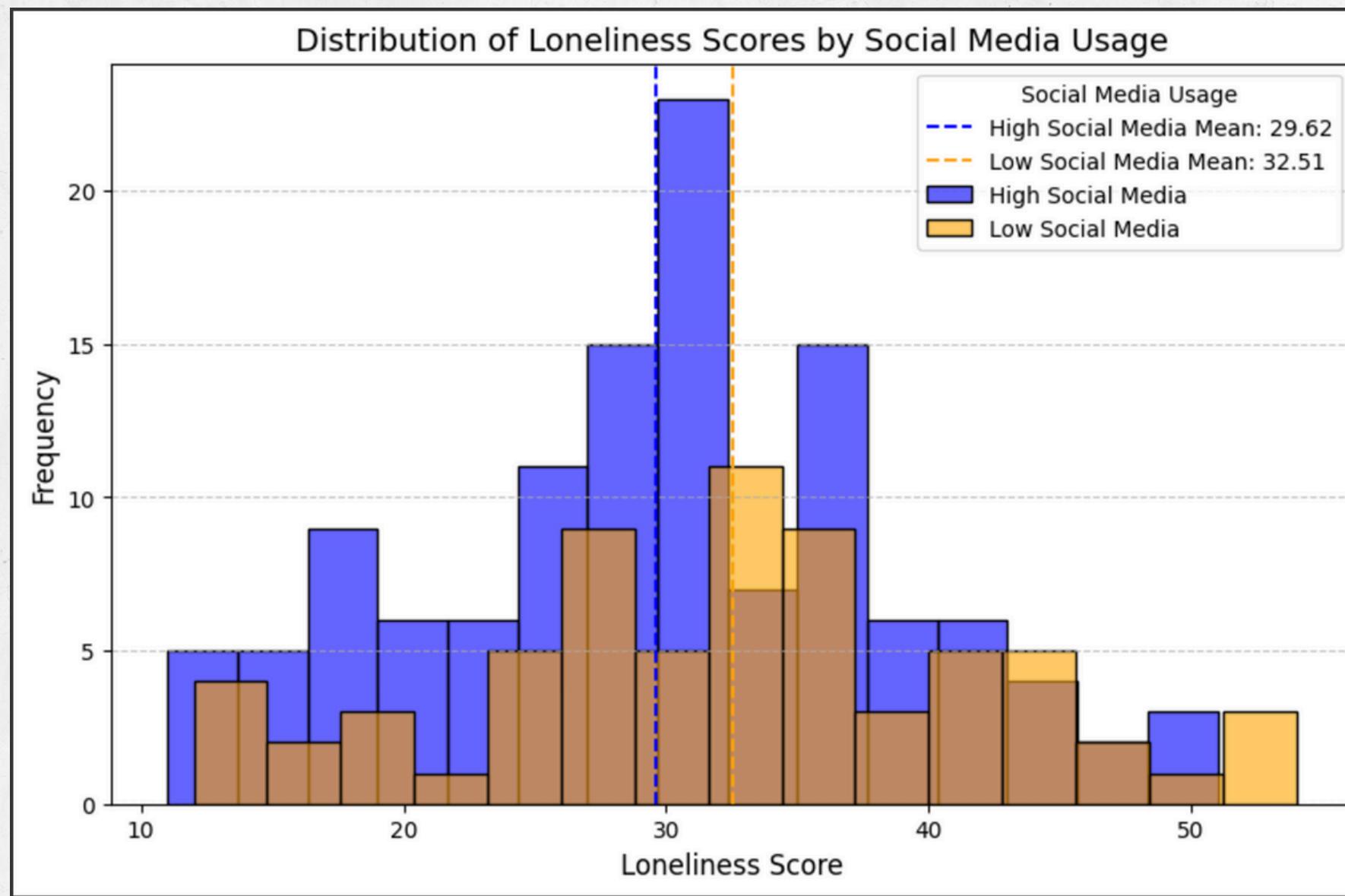
This analysis investigates whether high social media usage correlates with decreased existential loneliness. By comparing loneliness scores between individuals with high and low social media usage, we aim to understand its potential effects on mental well-being.

To analyze this, we categorized survey data on daily social media use into binary groups:

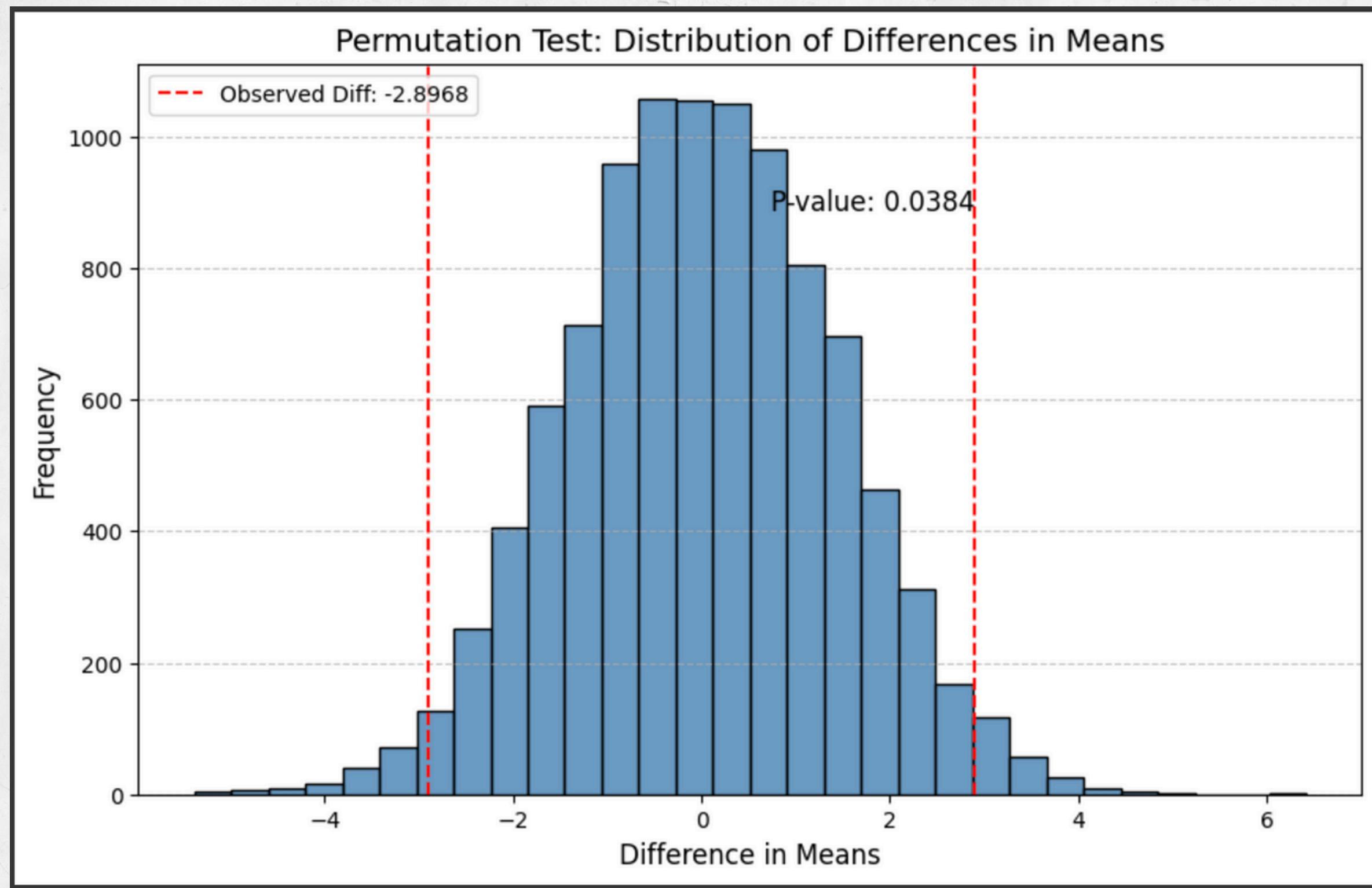
- 1 (High Social Media Usage): More than 1 hour per day.
- 0 (Low Social Media Usage): 1 hour or less per day.



Visualization: Histogram & Box Plot



Visualization: Permutation Test



Result Analysis

Statistic	Value
Observed Mean Difference	2.8968
P-Value	0.0384

Group	Mean Loneliness Score	Standard Deviation	Sample Size
Low Social Media	32.5147058	10.060255	68
High Social Media	29.6178861	8.87944	123

- The low social media group has a mean loneliness score of 32.51, while the high social media group has a mean of 29.62. This suggests that individuals with low social media usage report higher loneliness on average. The standard deviation is higher in the low social media group (10.06) compared to the high social media group (8.88), indicating more variation in loneliness scores.
- The sample sizes differ, with 68 participants in the low social media group and 123 in the high social media group. The observed mean difference is 2.89, showing a noticeable difference in loneliness between the groups.
- The p-value of 0.0384 indicates that the observed difference is statistically significant. This suggests that higher social media usage may be associated with lower levels of loneliness, but causality cannot be established.

Conclusion

This study found that individuals who spend more time on social media tend to report lower existential loneliness scores than those with less usage. However, given the binary categorization and potential confounding variables, these results are exploratory. Further research is needed to understand how social media influences loneliness over time and across diverse populations.

Limitations

1. Causality: The observational study doesn't establish cause-and-effect between social media use and loneliness.
2. Simplified Categorization: Grouping social media usage into just high vs. low oversimplifies the data, missing potential nuance.
3. Sample Bias: Data exclusions due to missing values may introduce bias, as those excluded might differ from the included participants.
4. Self-Reported Data: Loneliness scores are based on self-reporting, which can be influenced by personal bias or social desirability.

Research Question 3

**The effect of emotional
stability and social support on
extent of depression**



Introduction

- In modern society, mental health issues such as depression and anxiety are on the rise, significantly affecting the quality of life for many people.
- **Social support** and some personal characteristics (such as **emotional stability**) are suspected to be one of the factors that influence mental health. Therefore, we aim to explore this connection through this survey-based dataset.
- If such a link is established, it *might* help individuals experiencing depression and negativity improve their well-being and mental health by accessing greater social support.

01

Air

02

Air

03

Air

Method



Data used:

- WELLNESS_phq_score_y_n (Binary: yes/no data)
- PSYCH_zimet_multidimensional_social_support_scale_score (Continuous: numeric)
- PSYCH_ten_item_personality_inventory_emotional_stability_score (Countinuous: numeric)

There are many datasets, and we focus on the cohort ones. This is because the cohort category is derived from results obtained through continuous tracking and survey sampling.

The model used for this analysis is a **multiple logistic regression model** to predict the risk of developing depression (binary classification: presence or absence of depressive tendencies).

This is the model used in this case:

$$\log \left(\frac{P}{1-P} \right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2$$

The left part is called log odds. The RHS is similar to MLR.

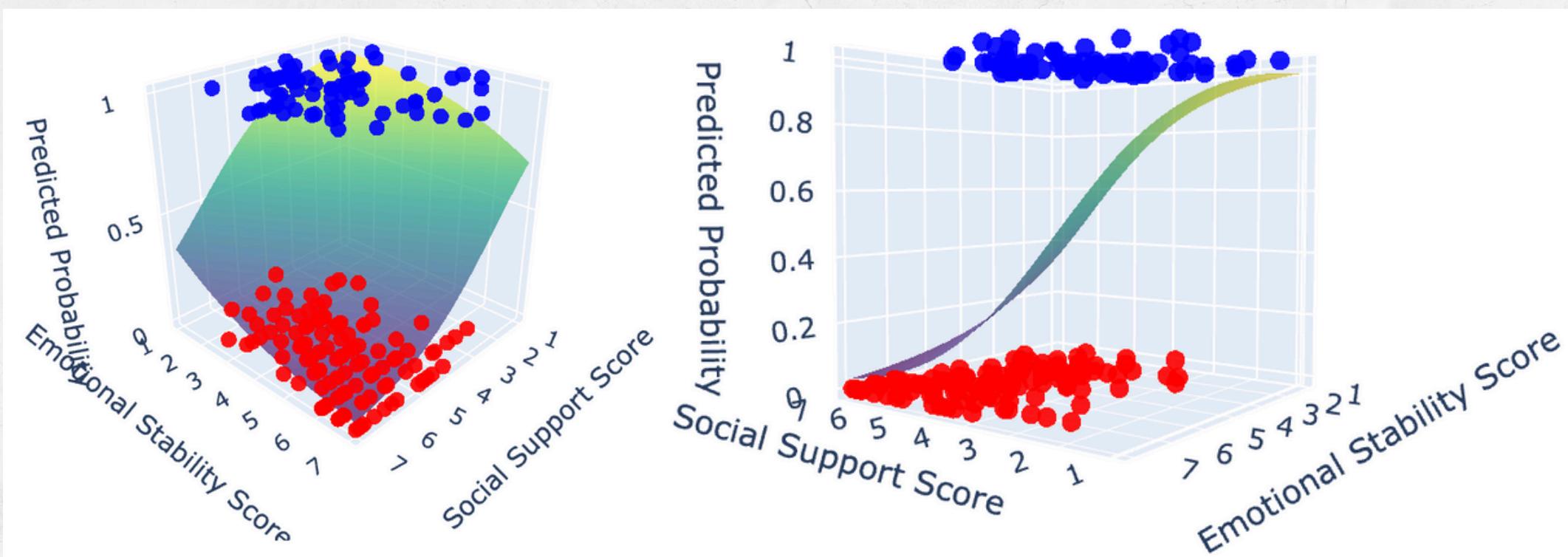
The log odds can be converted to actual probability.

Analysis

Interpretation of coefficients in the model fitted

Pseudo R-squ.:	0.2259	coef	std err	z	P> z	[0.025	0.975]	
		Intercept	4.8528	0.875	5.545	0.000	3.138	6.568
		PSYCH_zimet_multidimensional_social_support_scale_score	-0.7197	0.154	-4.679	0.000	-1.021	-0.418
		PSYCH_ten_item_personality_inventory_emotional_stability_score	-0.4644	0.115	-4.034	0.000	-0.690	-0.239

Visualization of the regression model



Pseudo R^2:

It provides a measure of how well the logistic regression model explains the variance in the dependent variable. 0.2259 in this case suggests a **moderate fit**.

Coef of social_support:

For every 1-unit increase in social support score, the odds of experiencing depression decrease by approximately 51.3%

Coef of emotional_stability:

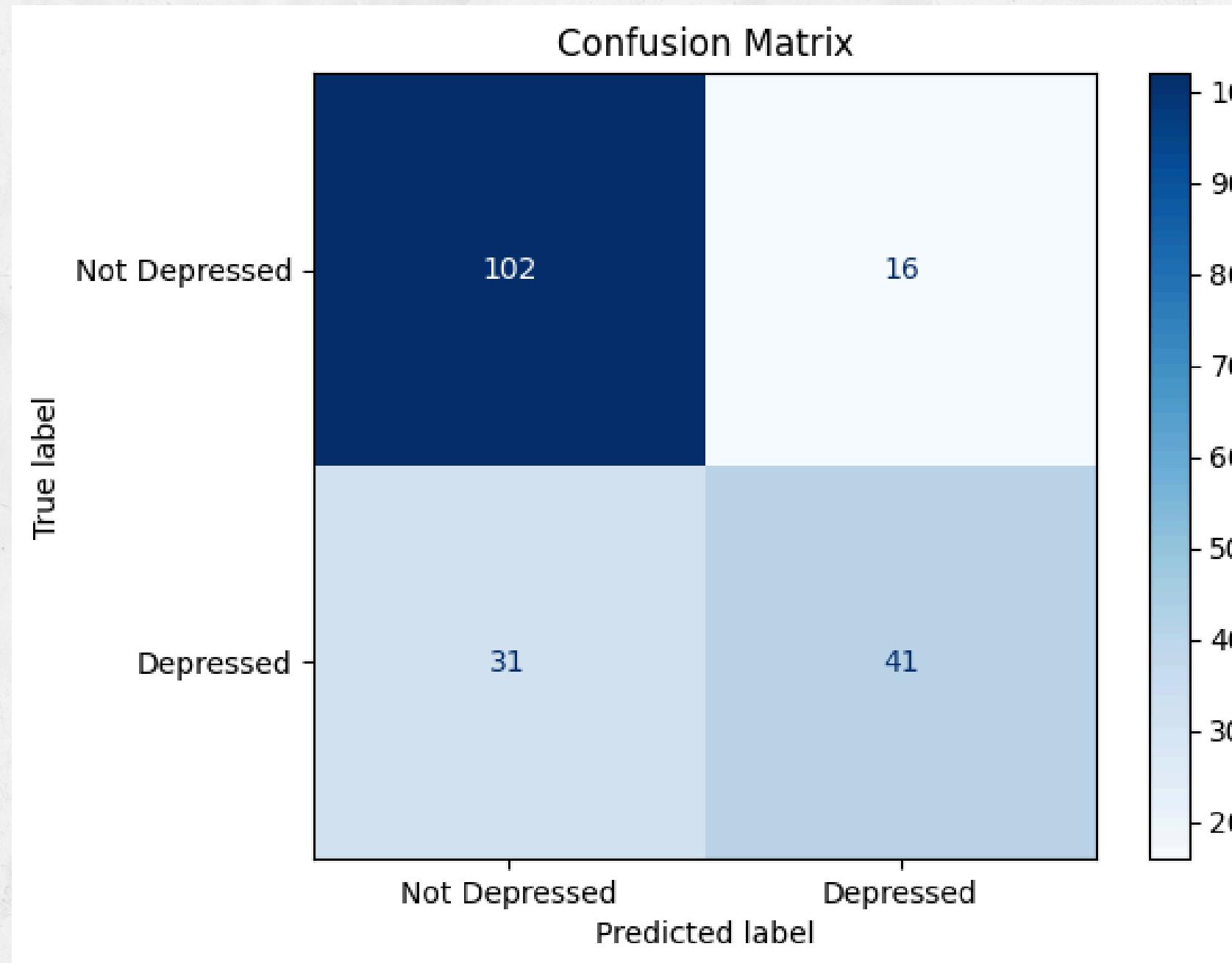
For every 1-unit increase in emotional stability score, the odds of experiencing depression decrease by approximately 37.2%

The scatter points are actual data.

The curved hyperplane reflects the predicted probability.

Analysis

Evaluate the performance of the model through confusion matrix



Accuracy is a metric that evaluates the rates of predictions that match the actual data compared to all predictions. **Sensitivity** is a metric that evaluated the rates of Positive data that is predicted correctly compared to all predictions with Positive data.

When the model is run to predict the dataset used, the **Accuracy** metric is 75.26%, while the **Sensitivity** metric is 56.94%, where the Positive is “Depressed” and the Negative is “Not Depressed”

Conclusion

High social support and emotional stability are correlated with lower depression risk.

Limitations

1. The sample size may affect the generalizability of the results.
2. The model does not account for other potential factors. (e.g., financial stress, loneliness, etc.)
3. Correlation ≠ Causation, which means other confounding variables (e.g., social life) may influence both the trend of predictors and the trend of outcome.

Conclusion/RQ



Research Question 1

Weak link between social barriers and happiness, suggesting other factors may be more important.



Research Question 2

Higher social media use linked to lower loneliness, but more research is needed on its long-term effects.



Research Question 3

Emotional stability and social support moderately affect depression risk, but other factors likely contribute.

Final Conclusion

This study examined the effects of various social and emotional conditions on mental well-being, specifically focusing on subjective happiness, loneliness, and depression.

Overall, while each analysis provides valuable insights into the relationship between social and emotional conditions and mental well-being, the results also highlight the complexity of these interactions, suggesting that further research is necessary to refine the models and explore additional contributing factors.

References

Github Sources:

- [#](https://raw.githubusercontent.com/pointOfive/stat130chat130/main/CP/var_names.csv)
- "https://raw.githubusercontent.com/pointOfive/stat130chat130/main/CP/CSCS_data_anon.csv"