

# How are U of U Students Affected by Instagram?

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# Questions

1. Does the BMI of an individual who has pictures of themselves on their Instagram account have an effect on the number of followers on their account?
2. Does BMI affect whether or not Instagram users post pictures of themselves on their Instagram?
3. Does BMI affect whether or not individuals have an Instagram account?
4. Does the daily time spent on Instagram affect an individual's GPA?
5. Does having an Instagram account affect an individual's GPA?

\*All questions are will be answered WRT the population of University of Utah students

# Data Collection

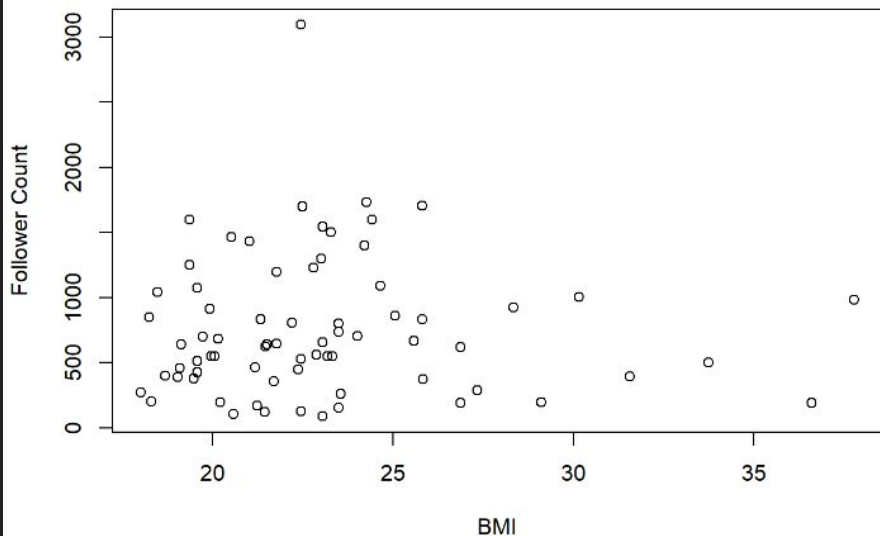
- Posted a survey on several discord channels and r/uofu
- Set up a table in front of the library with treats asking students who passed by to take our survey
- The survey asked for: (blue is for all surveyees, orange is only for Instagram users)
  - Cumulative GPA
  - Height
  - Gender
  - Hours of sleep per night
  - Weight
  - Whether respondents post picture of themselves on Instagram
  - Instagram follower count
  - Minutes spent per day on Instagram
  - Whether respondents felt like they spent too much time on Instagram

# Methodology

- Remove outliers and unserious responses (1000lbs, 10M followers, 7.0 GPA)
- Remove extraneous characters, format each entry in the dataset correctly
- Use formula to calculate a BMI column
- Run linear regression test for BMI vs Instagram Followers
- Run T-tests
- Run odds ratio test
- Calculate confidence intervals
- Graph results

# 1. BMI vs Instagram Followers (all genders)

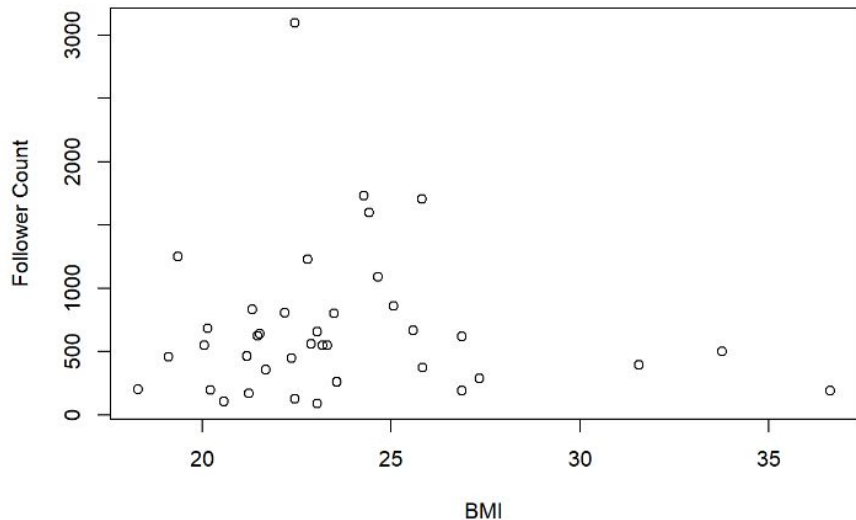
BMI vs Follower Count of those visible on their IG account



```
##  
## Call:  
## lm(formula = ig_posters$Followers ~ ig_posters$BMI, data = ig_posters)  
##  
## Residuals:  
##      Min       1Q   Median       3Q      Max   
## -672.0  -376.0  -121.3   265.3  2329.8   
##  
## Coefficients:  
##              Estimate Std. Error t value Pr(>|t|)      
## (Intercept)    811.785    374.958   2.165  0.0338 *   
## ig_posters$BMI    -2.162     16.035  -0.135  0.8931   
## ---  
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
##  
## Residual standard error: 537.8 on 69 degrees of freedom  
## Multiple R-squared:  0.0002633, Adjusted R-squared: -0.01423   
## F-statistic: 0.01818 on 1 and 69 DF, p-value: 0.8931
```

# 1. BMI vs Instagram Followers (male)

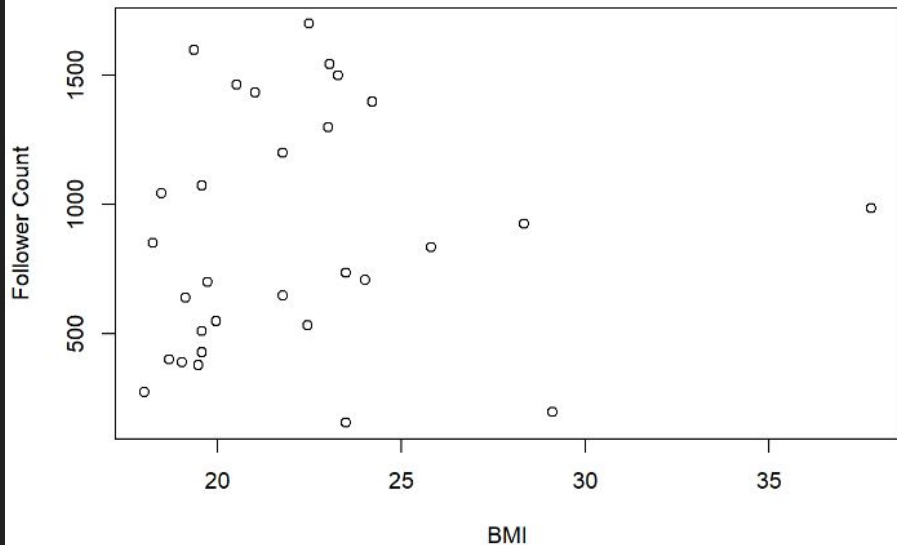
Male BMI vs Follower Count of those visible on their IG account



```
##
## Call:
## lm(formula = ig_postersMale$Followers ~ ig_postersMale$BMI, data = ig_postersMale)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -605.5  -355.6  -132.7   114.7  2399.2
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      892.83     614.45   1.453   0.155
## ig_postersMale$BMI      -8.86       25.63  -0.346   0.732
##
## Residual standard error: 594.1 on 36 degrees of freedom
## Multiple R-squared:  0.003309,    Adjusted R-squared:  -0.02438
## F-statistic: 0.1195 on 1 and 36 DF,  p-value: 0.7316
```

# 1. BMI vs Instagram Followers (female)

Female BMI vs Follower Count of those visible on their IG account



```
##  
## Call:  
## lm(formula = ig_postersFemale$Followers ~ ig_postersFemale$BMI,  
##     data = ig_postersFemale)  
##  
## Residuals:  
##      Min       1Q   Median       3Q      Max   
## -742.8  -339.2  -108.9   399.2   826.5   
##  
## Coefficients:  
##              Estimate Std. Error t value Pr(>|t|)      
## (Intercept)      648.656    476.629   1.361   0.184      
## ig_postersFemale$BMI      9.997     21.168   0.472   0.640      
##  
## Residual standard error: 466.3 on 28 degrees of freedom  
## Multiple R-squared:  0.007903,    Adjusted R-squared:  -0.02753   
## F-statistic: 0.223 on 1 and 28 DF,  p-value: 0.6404
```

1. Does the BMI of an individual who has pictures of themselves on their Instagram account have an effect on the number of followers on their account?

No evidence to suggest that BMI is correlated with the follower count of U of U students who post self-pictures on Instagram



## 2. BMI of those who do/don't post self pictures (all genders)

```
##  
## Welch Two Sample t-test  
##  
## data: ig_NonPosters$BMI and ig_posters$BMI  
## t = 2.1151, df = 56.475, p-value = 0.03884  
## alternative hypothesis: true difference in means is not equal to 0  
## 90 percent confidence interval:  
## 0.4162864 3.5603938  
## sample estimates:  
## mean of x mean of y  
## 25.03070 23.04236
```

$$\alpha = 0.1$$

Critical value:  $\pm 1.6722855$

## 2. BMI of those who do/don't post self pictures (by gender)

### Male

```
##  
## Welch Two Sample t-test  
##  
## data: ig_nonPostersMale$BMI and ig_postersMale$BMI  
## t = 1.5404, df = 46.822, p-value = 0.1302  
## alternative hypothesis: true difference in means is not equal to 0  
## 90 percent confidence interval:  
## -0.1559469 3.6454584  
## sample estimates:  
## mean of x mean of y  
## 25.42415 23.67939
```

$\alpha = 0.1$

Critical value:  $\pm 1.6780549$

### Female

```
##  
## Welch Two Sample t-test  
##  
## data: ig_nonPostersFemale$BMI and ig_postersFemale$BMI  
## t = -0.31365, df = 14.695, p-value = 0.7582  
## alternative hypothesis: true difference in means is not equal to 0  
## 90 percent confidence interval:  
## -2.154404 1.501239  
## sample estimates:  
## mean of x mean of y  
## 21.82789 22.15447
```

$\alpha = 0.1$

Critical value:  $\pm 1.7554422$

## Aside: Odds of posting self -pictures on IG by gender

	Posts self-pictures on IG	Doesn't post self-pictures on IG
Male	38	27
Female	30	5

```
##  
## Fisher's Exact Test for Count Data  
##  
## data: ig_posting_by_gender  
## p-value = 0.006644  
## alternative hypothesis: true odds ratio is not equal to 1  
## 95 percent confidence interval:  
## 0.06375243 0.72962556  
## sample estimates:  
## odds ratio  
## 0.2377679
```

2. Does BMI affect whether or not Instagram users post pictures of themselves on their Instagram?

### BMI *may* affect whether Instagram users post self-pictures\*

- 90% confident that mean BMI of those who post self-pictures is different from mean BMI of those who don't post self-pictures (for all genders)
- Separating the data by male/female did not show a significant difference between BMI of those who do/don't post self-pictures for either gender
- 95% confident that females were more likely to post self-pictures on IG

### 3. BMI of those who don't/do have an Instagram (all genders)

```
##  
##  Welch Two Sample t-test  
##  
## data:  nonIg_users$BMI and ig_users$BMI  
## t = -2.0665, df = 52.798, p-value = 0.04371  
## alternative hypothesis: true difference in means is not equal to 0  
## 90 percent confidence interval:  
##  -2.8807735 -0.3020627  
## sample estimates:  
## mean of x mean of y  
##  22.09479  23.68620
```

$\alpha = 0.1$

Critical value:  $\pm 1.6742304$

### 3. BMI of those who don't/do have an Instagram (by gender)

#### Male

```
##  
## Welch Two Sample t-test  
##  
## data: nonIg_usersMale$BMI and ig_usersMale$BMI  
## t = -2.022, df = 41.477, p-value = 0.04966  
## alternative hypothesis: true difference in means is not equal to 0  
## 90 percent confidence interval:  
## -3.485607 -0.319529  
## sample estimates:  
## mean of x mean of y  
## 22.50157 24.40413
```

$\alpha = 0.1$

Critical value:  $\pm 1.6824311$

#### Female

```
##  
## Welch Two Sample t-test  
##  
## data: nonIg_usersFemale$BMI and ig_usersFemale$BMI  
## t = -1.4367, df = 8.9485, p-value = 0.1848  
## alternative hypothesis: true difference in means is not equal to 0  
## 90 percent confidence interval:  
## -4.149646 0.504470  
## sample estimates:  
## mean of x mean of y  
## 20.28523 22.10782
```

$\alpha = 0.1$

Critical value:  $\pm 1.8343155$

## Aside: Odds of using Instagram by gender

	Uses Instagram	Doesn't use Instagram
Male	65	21
Female	35	6

```
##
## Fisher's Exact Test for Count Data
##
## data:  ig_usage_by_gender
## p-value = 0.2514
## alternative hypothesis: true odds ratio is not equal to 1
## 95 percent confidence interval:
##  0.160775 1.532429
## sample estimates:
## odds ratio
##  0.5330903
```

3. Does BMI affect whether or not individuals have an Instagram account?

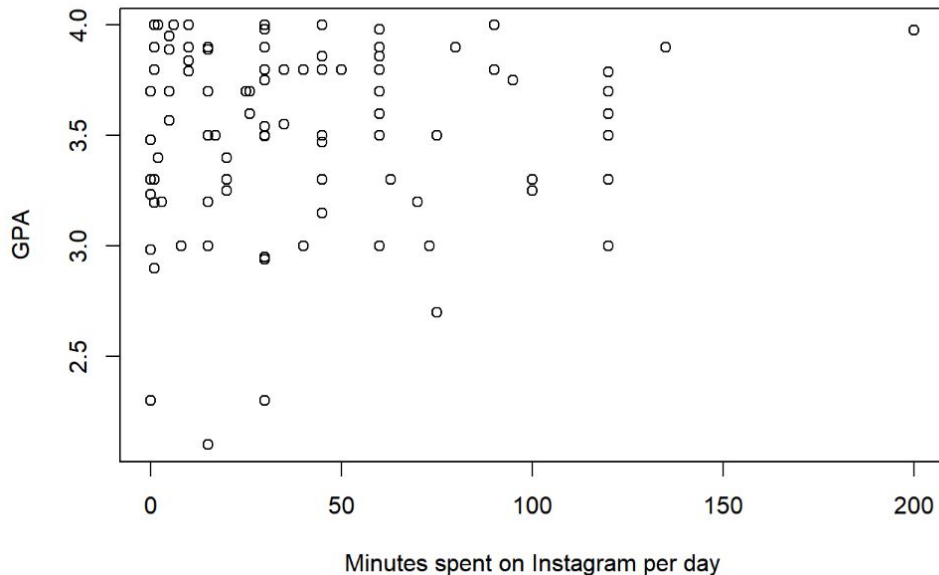
BMI *may* affect whether or not individuals have an IG account\*

- 90% confident that the mean BMI of IG users is different from the mean BMI of those who don't use IG (for all genders)
- 90% confident that the mean BMI of male IG users is different from the mean BMI of males who don't use IG
- Not enough evidence to suggest that there's such difference for females
- Not enough evidence to suggest that males or females are more likely to have an IG account



## 4. Time Spent on Instagram vs GPA

Time spent daily on Instagram vs GPA



```
##  
## Call:  
## lm(formula = ig_users$GPA ~ ig_users$MinsOnIG, data = ig_users)  
##  
## Residuals:  
##      Min       1Q   Median       3Q      Max   
## -1.39828 -0.24168  0.08193  0.30181  0.52021   
##  
## Coefficients:  
##              Estimate Std. Error t value Pr(>|t|)      
## (Intercept)    3.478471   0.059420   58.54  <2e-16 ***  
## ig_users$MinsOnIG 0.001320   0.001074    1.23   0.222      
## ---  
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
##  
## Residual standard error: 0.4127 on 101 degrees of freedom  
## Multiple R-squared:  0.01475,    Adjusted R-squared:  0.004992   
## F-statistic: 1.512 on 1 and 101 DF,  p-value: 0.2217
```

## 5. GPA of those who don't/do have an Instagram

```
##  
## Welch Two Sample t-test  
##  
## data: as.numeric(ig_users$GPA) and as.numeric(nonIg_users$GPA)  
## t = -2.0385, df = 51.664, p-value = 0.02331  
## alternative hypothesis: true difference in means is less than 0  
## 95 percent confidence interval:  
##      -Inf -0.02739135  
## sample estimates:  
## mean of x mean of y  
##  3.531738  3.685286
```

$\alpha = 0.05$

Critical value: -1.6748864

4. Does the daily time spent on Instagram affect an individual's GPA?

No evidence to suggest that daily time spent on IG is correlated with U of U students' GPA

5. Does having an Instagram account affect an individual's GPA?

95% confident that the mean GPA of IG users is less than the mean GPA of those who don't use IG

# Considerations

## Problems:

- More male respondents than female respondents
  - Out of 136 respondents, 86 were male, 44 were female, 6 were non-binary/other
- More respondents who used Instagram than those who didn't
  - 105 Instagram users, 28 non-Instagram users
- Over representation of STEM majors

## Solutions:

- Perform stratified sampling by gender
- Perform stratified sampling by Instagram usage
- Obtain **all** samples by surveying in person rather than collecting many via discord

## Considerations cont.

- Respondents put their own answers for all the questions. These are likely inaccurate
- Imperfect random sample. Collected data only from willing participants at the library and discord
- We could not control for several confounding variables
- BMI is not a perfect indicator of body type
- We could not control for respondent bias

# Conclusions Impact

Despite the imperfections of this study, we do have some evidence that Instagram may be negatively affecting U of U students

Our study does not prove that Instagram does not affect U of U students

Further research should be done into how Instagram affects U of U students