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Communicating in an IT Environment

Assignment 2

Research Paper:

Facebook User Psychology

Martin Ponce

Student 10371381

Tutor: Dr. Mark Brogan

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1 Abstract

This research paper explores the role of gender and its effects relating to personal Facebook use. Facebook is one of today's leading Social Networking Sites (SNS) and the company reports that as of June 2014, their network serves 1.32 billion users per month (Facebook, 2014).

Through this paper's literature review, an inconsistent view of gender and its relation to Social Networking Site (SNS) network size was identified. The first thesis statement that this paper will investigate is "Gender is related to a user's Facebook network size". The literature reviewed also indicate that women are attracted to the social aspect of Facebook more than men. Since the majority of activities on SNS relates to socialising, this research paper suggests that gender is related to the amount of time a user spends on Facebook. To investigate this view, the second thesis statement to be explored is "Gender is related to the amount of time a user spends on Facebook".

The current sample set consists of 48 fictional participants, 3 female, 45 male (M = 0.983, SD = 0.2446, gender coded as 0 = female, 1 = male) between the ages of 17 to 29 (M = 20.6, SD = 3.206543) from a university in Perth, Western Australia, who responded to a survey which included questions about their personal Facebook use, demography and personality.

The following variables were compared with gender in response to the thesis statements: Facebook friends, Close friends, Sociability and Facebook hours. The selected variables were all identified with non-normal distributions and non-parametric tests, Spearman's correlation and Wilcox rank sum, were chosen to identify correlation and test hypotheses.

Results of the tests found no correlation between gender and the chosen variables. However, with such a small number of female observations in the study, there is not enough evidence to provide any conclusions from the results.

2 Introduction

This research paper explores the role of gender and its effects relating to personal Facebook use. Facebook is one of today's leading Social Networking Sites (SNS) and the company reports that as of June 2014, their network serves 1.32 billion users per month (Facebook, 2014). Independent studies have also shown that SNS users were more likely to be using Facebook than any other SNS site (Hampton & Goulet, 2011; Hargittai, 2007; Raacke & Bonds-Raacke, 2008). As Facebook expanded registration to users outside educational and professional institutions in September 2006 (Facebook, 2014), users were quick to adopt the technology at a fast paced rate (Mazman & Usluel, 2011). This adoption rate has triggered a multitude of scientific research "from widely different fields of inquiry", attempting to explain the phenomenon of Facebook (Caers et al., 2013, p. 983).

Differences in gender is a facet of SNS use that has been investigated by many researchers (Fallows, 2005; Haferkamp, Eimler, Papadakis, & Kruck, 2012; Hargittai, 2007; Joiner et al., 2014; Kimbrough, Guadagno, Muscanell, & Dill, 2013; Mathiyalakan, Heilman, & White, 2014; Mazman & Usluel, 2011). Men have been generally regarded as earlier adopters of technology compared to women, and the adoption of SNS such as Facebook has been no different. Pitkow and Recker's (1994)

study showed that during the mid 1990's, 95% of Internet users were men, while research by Fogel and Nehmad (2009) demonstrates that men are also earlier adopters of SNS, finding that more men had established accounts before women. However, the trend has shifted, with recent reports indicating that women now represent the majority of SNS users compared to men (Duggan & Brenner, 2013; Hampton & Goulet, 2011).

As the Internet user gender gap disappears, it is more important than ever to understand the differences between genders and its effects relating to personal SNS use, so that current social networking sites and social networking sites of the future are able to service, and attract both men and women equally. This research paper will explore the role of gender in SNS, in particular the relationship with gender and network size, and the relationship of gender and amount of Facebook use.

3 Discussion

Fallows (2005) compared American male and female Internet users and found that men were more likely to use the Internet in general for information gathering purposes, while women were more likely to use the Internet for social applications to maintain current relationships. According to the literature in this review, this statement also translates to the use of SNS such as Facebook.

3.1 Social gender role theory and gender motivations

Eagly's (1987) theory of social gender roles introduces a framework to explain differences in gender, regardless of being online or offline, which underpins many cyberpsychology studies (Hum et al., 2011; Kimbrough et al., 2013; Tifferet & Vilnai-Yavetz, 2014). This theory characterizes men as "*agentic* providers" and women as "*communal* caregivers" (Hum et al., 2011, p. 1830). In other words, according to this theory, men tend to develop traits which lend to task-based activities, while women tend to develop traits which lend to social interactions. The theory of social gender roles is one of many frameworks used to explain the differences between gender in SNS and Internet use, which is evident in Fallows's (2005) generalisation that men use the Internet for information gathering purposes, and women use the Internet for social activities.

3.2 Male gender role and motivations

Widely cited research by Raacke and Bonds-Raacke (2008) was among the first to examine the impact of SNS on college students and observed that men, compared to women, were more likely to use SNS to find out about events, indicating that men spend more time than women performing information-gathering activities on SNS. In support of this view, Choi and Kim (2014, p. 2) hypothesise that men have higher positive attitudes towards SNS advertising than women, as men are more likely to perceive such advertising as "useful information" due to their "information-oriented motivation". The presented evidence supports Eagly's (1987) social gender theory. On the other hand, Park, Kee, and Valenzuela (2009) argues by claiming that women were more likely to use Facebook Groups for obtaining information. However, this study only examines the use of Facebook *Groups* and not Facebook as a whole.

In comparison to women using SNS as a medium to maintain existing relationships, men have been found to use SNS as a tool for creating new relationships and expanding their networks (Mazman & Usluel, 2011). This view is supported by findings in research by Muscanell and Guadagno (2012), Raacke and Bonds-Raacke (2008) and Haferkamp et al. (2012), which illustrates that men are more likely to use SNS for dating purposes than women. These findings reiterate a difference in motivation of SNS use between genders.

3.3 Female gender role and motivations

In contrast, Mazman and Usluel (2011) and Muscanell and Guadagno (2012) both assert that women are more likely to seek out old friends on the network, and are more likely to utilise SNS communication tools to maintain existing relationships. To support this statement, Joiner et al. (2014) provides evidence that women are more likely to demonstrate higher emotional support in response to a friend's negative Facebook status update. Women are also twice as likely to respond publicly to a negative status update when compared to men (Joiner et al., 2014, p. 167). These statements lend to the hypothesis that women use SNS as a tool for relationship maintenance more than men, which align with Eagly's (1987) theory of social gender roles.

As the female gender role is more concerned with socialising than men, it could be assumed that women would have more friends within their SNS network. Raacke and Bonds-Raacke (2008) and Fogel and Nehmad (2009) found the contrary, demonstrating that men had more friends than women, which could support the theory that men use SNS to expand their networks more than women. Nevertheless, more recent research by McAndrew and Jeong (2012) found that women have more friends than men. The contradiction in findings could be due to the difference in time frames in which these studies occurred, and as Fallows (2005) suggest, women have since caught up to men in Internet connectedness. However, according to Tifferet and Vilnai-Yavetz (2014, p. 389), there are many studies that have conflicting conclusions relating to gender and network size, which warrants further investigation.

4 Research questions and thesis statements

4.1 Research question 1: Is gender related to a user's Facebook network size?

Gender and its relation to SNS network size has been found to be a topic of debate. As indicated by Tifferet and Vilnai-Yavetz (2014), studies have reported conflicting results and require further investigation. The variables measured in the current dataset allows the research question and thesis statement to explore these conflicting views.

4.2 Thesis statement 1: Gender is related to the size of a user's Facebook network

The number of Facebook friends, offline close friends and sociability scores will be tested against gender, seeking any correlations that may support or negate the

hypothesis that gender is related to a user's Facebook network size.

4.3 Research Question 2: Is gender related to the amount of time a user spends on Facebook?

The literature in the review suggests that women are attracted to the social aspect of Facebook and SNS more than men. Since the majority of activities on such sites are related to socialising, it is possible to suggest that gender is related to the amount of time a user spends on Facebook.

4.4 Thesis statement 1: Gender is related to the amount of time a user spends on Facebook

Reported hours will be tested against gender, seeking any correlations that may support or negate the hypothesis that gender is related to the amount of time a user spends on Facebook.

5 Data analysis and interpretation

5.1 Participants

The sample initially consisted of 61 fictional under-graduate students from a University in Perth, Western Australia who responded to a survey regarding their Facebook use.

Out of the 61 observations, five were excluded from the dataset with NA responses. Three observations were excluded with responses to the questionnaire as "0" (zero). The dataset was then screened for outliers, excluding two observations with reported Facebook logins greater than 50 per week. One observation was excluded, with reported hours spent Facebook greater than 50 per week. Finally, two observations were excluded, with reported number of close friends greater than 70.

This resulted in a final sample of 48 Facebook users, 3 female, 45 male (M = 0.938, SD = 0.2446) between the ages of 17 to 29 (M = 20.6, SD = 3.206543). Gender is coded as 0 = female and 1 = male in the dataset.

5.2 Survey

Each participant filled out a survey which consisted of ten sections. The first section included questions about the participants demography, requesting their age and sex. The second section included questions regarding the amount of Facebook use, requesting self-reported estimates on the number of Facebook logins per week, and hours spent per week on Facebook. The third section included questions regarding the participant's social networking and connection, requesting self-reported estimates on how many Facebook friends they have, how many offline close friends they have, and a 5 point Likert-style scale opinion of their own sociability; 1 = strongly disagree, 5 = strongly agree.

The fourth and final section included personality surveys, measuring extraversion, self-esteem and social anxiety. Extraversion was measured through a personality test of 25 items, the scores of which were converted to an integer value between 1

and 25. A lower value suggests introversion and a higher value suggests extraversion. Self esteem was measured using a Rosenberg self esteem scale survey of 10 items. The scale ranges between 0 to 30, with scores between 15 to 25 considered normal, and scores below 15 suggesting low self esteem. Social anxiety was measured using a Liebowitz Social Anxiety Scale survey of 24 items, with scores between 55 to 65 suggesting moderate social phobia, scores between 65 to 80 suggesting marked social phobia, 80 to 95 suggesting severe social phobia and scores greater than 95 suggesting very severe social phobia.

5.3 Descriptive statistics

This research paper aims to explore the relationship between gender and network size, and the relationship between gender and amount of time spent on Facebook. As such, the following measured variables from the survey have been selected for this research:

- **Gender:** The categorical variable with binary values 0, = female or 1 = male.
- **Facebook friends (FB friends):** Primary variable related to testing Thesis Statement 1.
- **Close friends:** Secondary variable related to testing Thesis Statement 1, exploring the possibility that gender is also related to number of close friends offline, and may provide further evidence for Thesis Statement 1.
- **Sociability:** Secondary variable related to testing Thesis Statement 1, exploring the possibility that gender may also have a correlation with Sociability, and may provide further evidence for Thesis Statement 1.
- **Facebook hours:** Primary variable related to testing Thesis Statement 2.

Table 1 provides centrality and variance measures of the selected variables.

Table 1: Measures of centrality and variance

Variable	Min	Max	Mean	Median	Mode	Std. Dev	Skew	Kurt
Gender	0	1	0.9375	1	1	0.2446	-3.502	10.49
FB Friends	33	798	290.7	275	242	176.001	0.7959	0.04759
Close Friends	6	53	21.73	19	23	12.29	0.9668	0.1483
Sociability	2	5	3.667	4	4	0.7532	-0.5633	-0.008646

With gender coded as 0 = female and 1 = male, the gender mean of 0.9375 demonstrates that the majority of participants within this dataset are men. Women only represent 3 of the total 48 observations. This limitation will pose a recurring problem throughout this research paper.

Facebook friends exhibits the highest variance about the mean, with a standard deviation of 176.001. A positive skew of 0.7959 and high variance is caused by a potential outlier, with a maximum score of 798. The exclusion of this outlier

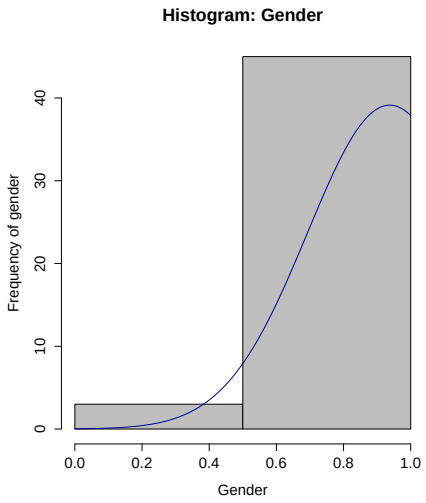
could possibly normalize the variance and skew, however, the score belongs to an observation from a female participant, and the exclusion would result in a dataset with only 2 female participants. Therefore, it was decided that this observation would not be screened, so that the following tests would include as many female participants as possible.

The figures below include histograms and q-q plots to assist in identifying a normal or non-normal distribution.

5.3.1 Gender

Figure 1 shows the histogram for gender. The blue curve overlay demonstrates a non-normal distribution. Only non-parametric tests are applicable for this variable. This histogram also demonstrates the gender imbalance of the sample set.

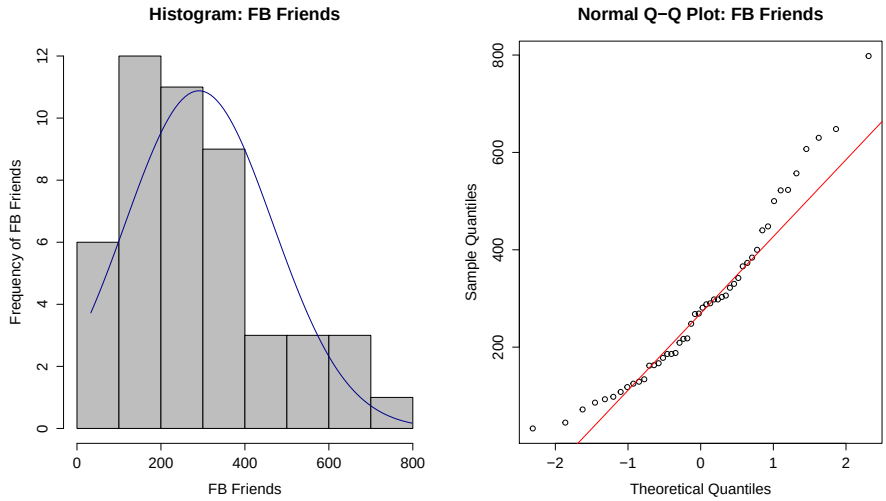
Figure 1: Histogram: Gender



5.3.2 Facebook friends

Figure 2 shows the histogram and normal q-q plot for Facebook friends. The blue curve overlay on the histogram demonstrates a non-normal distribution. The normal q-q plot also demonstrates a non-normal distribution, as the majority of data-points do not fall on the expected normal distribution line. Only non-parametric tests are applicable for this variable.

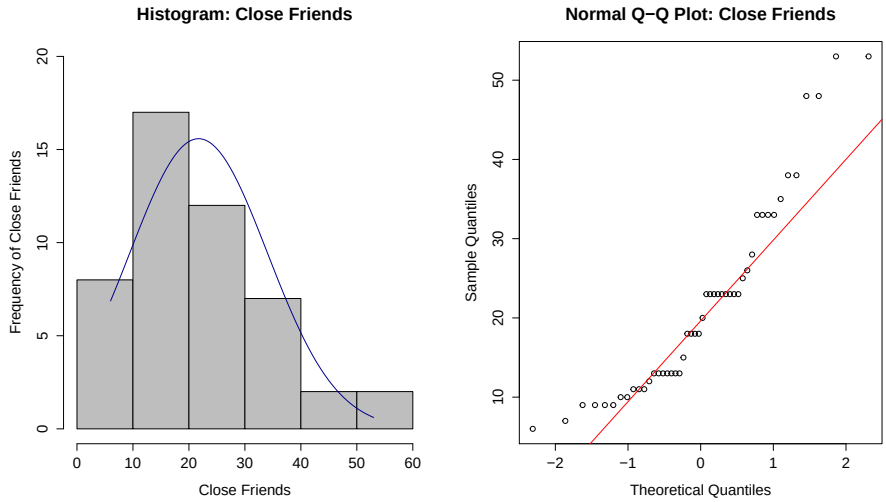
Figure 2: Histogram and Normal Q-Q Plot: Facebook friends



5.3.3 Close friends

Figure 3 shows the histogram and normal q-q plot for close friends. The blue curve overlay on the histogram demonstrates a non-normal distribution. The normal q-q plot also demonstrates a non-normal distribution, as the majority of data-points do not fall on the expected normal distribution line. Only non-parametric tests are applicable for this variable.

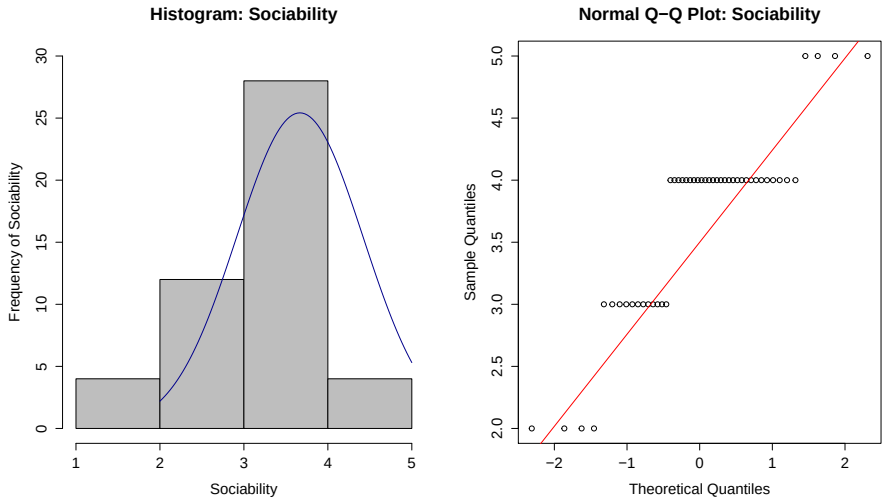
Figure 3: Histogram and Normal Q-Q Plot: Facebook friends



5.3.4 Sociability

Figure 4 shows the histogram and normal q-q plot for Sociability. The blue curve overlay on the histogram demonstrates a non-normal distribution. The normal q-q plot also demonstrates a non-normal distribution, as the majority of data-points do not fall on the expected normal distribution line. Only non-parametric tests are applicable for this variable.

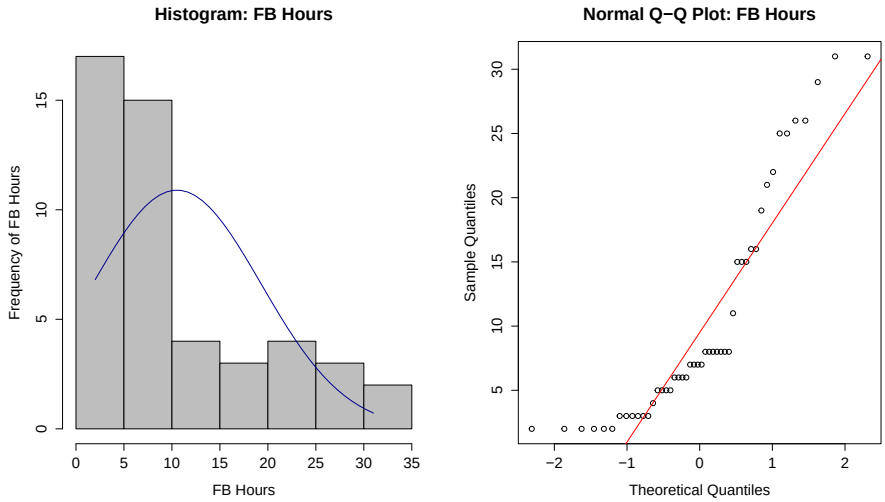
Figure 4: Histogram and Normal Q-Q Plot: Sociability



5.3.5 Facebook hours

Figure 5 shows the histogram and normal q-q plot for Facebook hours. The blue curve overlay on the histogram demonstrates a non-normal distribution. The normal q-q plot also demonstrates a non-normal distribution, as the majority of data-points do not fall on the expected normal distribution line. Only non-parametric tests are applicable for this variable.

Figure 5: Histogram and Normal Q-Q Plot: Facebook hours



5.4 Bivariate inferential tests

5.4.1 Scatter plots and regression

Figure 6 displays scatter plots with a linear regression overlay in comparison with gender and Facebook friends, Close friends, Sociability and Facebook hours.

The results indicate a moderate negative relationship between gender and Facebook friends, and between gender and Facebook hours. A weak negative relationship is observed between gender and Close friends, and no relationship at all between gender and Sociability.

In other words, the negative relationships exhibit that women, represented as 0 on the x axis, tend to have higher scores than men, shown as 1 on the x axis, in Facebook friends, Close friends and Facebook hours, as the regression line shows a reversed slope from 0 to 1.

However, linear regression analysis assumes that data is normally distributed and therefore is not a suitable test with the current dataset (McKillup, 2011, p. 263). Linear regression is calculated with the following formulas (McKillup, 2011, p. 247-249).

To calculate the average slope of the regression line:

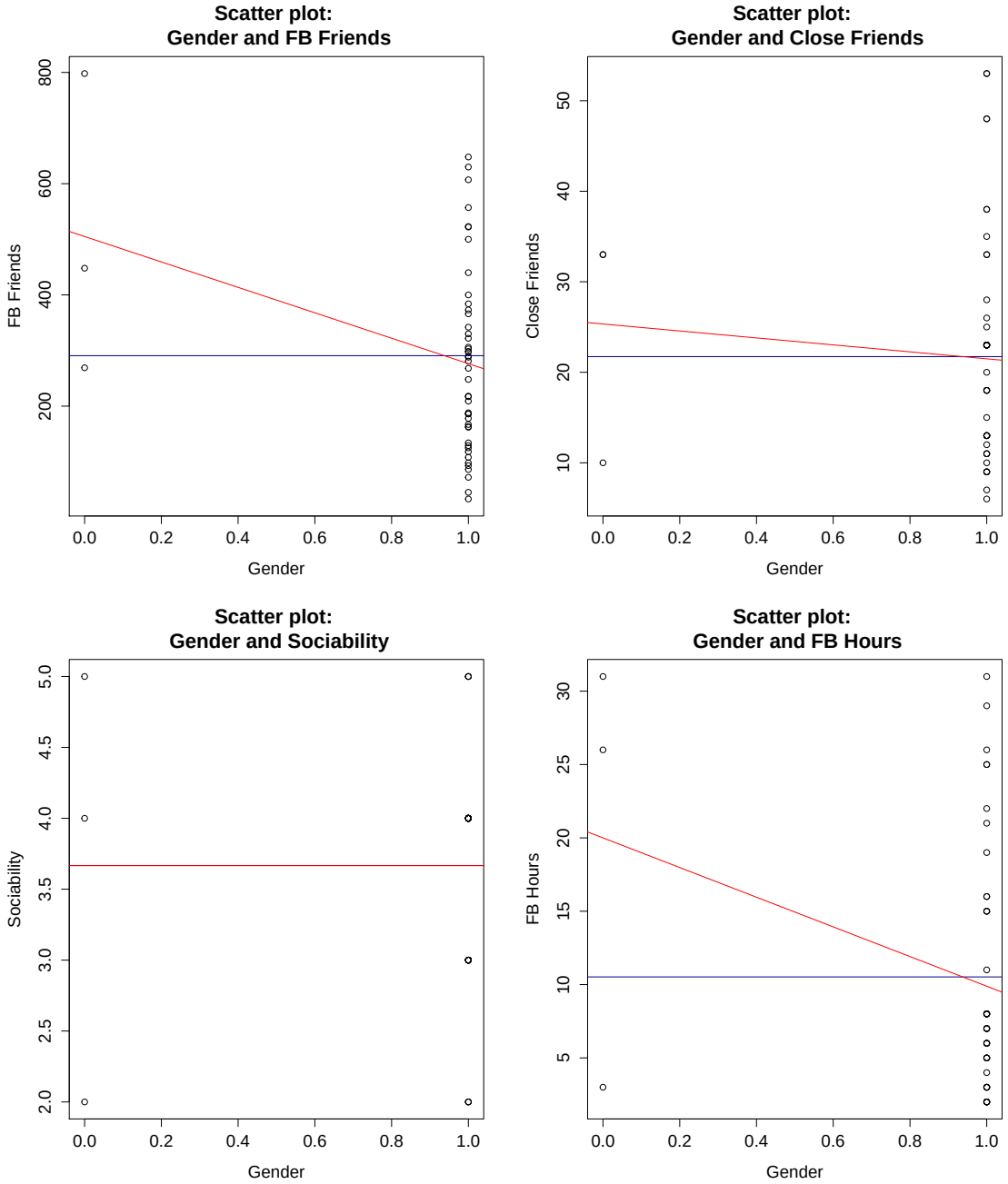
$$b = \frac{\sum_{i=1}^{N}(X_i - \bar{X})(Y_i - \bar{Y})}{\sum_{i=1}^{N}(X_i - \bar{X})(X_i - \bar{X})}$$

To calculate the intercept at the y axis:

$$a = \bar{Y} - b\bar{X}$$

Due to the reliance of the sample mean in linear regression analysis, the result for Facebook friends has been influenced by the inclusion of a previously identified outlier score from a female participant. And while males and females both have a maximum score of 31 for Facebook hours, the small number of female participants has allowed the female Facebook hours mean to increase higher than that of men. In spite of females having a much lower Close friends maximum score than men, the small number of female participants has also lead to an increased female Close friends mean. Therefore, it is apparent that linear regression is not a suitable test, and there is simply not enough data from female participants to provide any conclusions.

Figure 6: Scatter Plots



5.4.2 Spearman's correlation coefficient

A non-parametric correlation test has been selected to identify any correlation between gender and Facebook friends, Close friends, Sociability or Facebook hours. Table 3 displays the non-parametric Spearman's correlation coefficient results for each variable compared with gender. A one-tailed test has been chosen due to the expectation that women will have higher scores than men, as seen in Figure 6.

r_s is calculated by ranking the scores, then calculating the correlation coefficient using the following formula (Gauthier, 2001, p. 359), where d = the difference between each pair of ranks from the values of variables x and y, and n = the number of paired values in the sample:

$$r_s = 1 - \frac{6\sum_{i=1}^{N} d_i^2}{n(n^2-1)}$$

A moderate negative correlation has been found between gender and Facebook friends ($r_s = -0.2391, N = 48, P > 0.05$), and a moderate negative correlation has been found between gender and Facebook hours ($r_s = -0.1747, N = 48, P > 0.05$). However, p-values for all tests are considered insignificant being $> \alpha = 0.05$. Therefore, the null hypothesis that there are no correlations between gender and the selected variables is not rejected.

Two-tail and negated one-tail tests were also performed, only to find higher, insignificant p-values.

Table 2: Spearman's correlation coefficient - Gender

Variable	r_s	p-value
FB Friends	-0.2391999	0.05077
Close Friends	-0.08123761	0.2915
Sociability	-0.04207032	0.3882
FB Hours	-0.1747336	0.1174

Since all variables being tested are non-normally distributed, Spearman's non-parametric method is a suitable test and results considered reliable. However, the insignificant p-values indicate that the higher scores for women have occurred by chance due to the fact that there is so few female observations in the sample set.

5.4.3 Wilcox rank sum test

A non-parametric independent samples test has been selected to test the null hypothesis that the distribution of scores of the selected variables between men and women are equal (Coolican, 2014). A one-tail test has been chosen due to the expectation that women will have higher scores than men, as seen in Figure 6. The results of this test are shown in Table 4.

Table 3: Wilcox rank sum test - Gender

Variable	W	p-value
FB Friends	106	0.05277
Close Friends	80.5	0.2961
Sociability	73.5	0.3957
FB Hours	95.5	0.1197

Similar insignificant p-values $> \alpha = 0.05$ are found to those of the Spearman's correlation coefficient test, seen in Table 3. While it is possible to conclude that the null hypothesis survives, there is not enough female observations in the dataset to provide conclusive evidence that these test results are accurate.

6 Conclusion

The aim of this research paper is to explore the relationships between gender and Facebook use. Observations were collected from 48 fictional participants from a survey and the following thesis statements were tested by comparing gender and the number of Facebook friends, the number of close friends, the Sociability score and reported Facebook hours.

Out of the total 48 participants, only 3 were women. The data collected from the participants were identified as non-normally distributed, and therefore non-parametric tests were selected.

6.1 Thesis statement 1: Gender is related to the size of a user's Facebook network

This research paper's literature review discovered that there were conflicting views on the topic of gender and network size. Gender was compared with Facebook friends to find any supporting evidence that gender is related to the size of a user's Facebook network.

Spearman's correlation coefficient test and Wilcox rank sum test both indicate that there is no correlation between gender and Facebook friends, however due to the small number of female participation, no conclusions can be made with the results.

Secondary variables were also explored, testing Close friends and Sociability with gender, which may have provided further evidence towards the thesis statement. Both non-parametric tests indicate that there is no correlation between gender and Close friends or Sociability. With such a small number of female participants, no conclusions can be made with the results.

6.2 Thesis statement 2: Gender is related to the amount of time a user spends on Facebook

The literature review suggested that women are attracted to the social aspect of Facebook and SNS more than men. This research paper aimed to explore that statement by comparing gender with reported Facebook hours.

Again, both non-parametric tests found that there is no correlation between gender and Facebook hours. However, there is not enough evidence from female participants for conclusions to be made with the results.

6.3 Limitations

Due to the small amount of female representation in the sample set, no conclusions from the test results could be made, and posed a recurring limitation in this research paper. Further research is recommended with a sample set which includes an equal balance between male and female participants. Actual Facebook friend numbers rather than self-reported estimates would also further enhance any future study results.

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