

An Investigation on the Relation Between Self-Esteem, Narcissism, and Instagram Use

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The impact of social networking sites on human functioning is growing immensely among the population of young adults. This study investigated whether Instagram use behaviours, such as posting, liking, commenting, and the amount of time spent on the platform would predict measures of self-esteem and narcissism in young adults. Participants were asked to complete three online self-report questionnaires assessing Instagram use, self-esteem levels, and narcissistic characteristics. Through two stepwise multiple linear regression analyses, spending time on Instagram was predictive of both self-esteem and narcissism scores, but the behaviours of posting, liking, and commenting were not. The limitations include a restricted sample, self-reported data, and a lack of a standardized measure assessing Instagram use in more depth. Future research could benefit from the assessment of various age groups and populations who use social media, as well as the creation of a reliable and valid measure to assess Instagram use behaviour.

Keywords: self-esteem, narcissism, behaviour, Instagram

Background

Social media is a relatively new phenomenon, and the use of social networking sites has become increasingly prevalent today (Vaterlaus et al., 2015). Social media and networking platforms include Facebook, Instagram, Twitter, YouTube, and many others in which individuals are immersed in an environment of creating and consuming content. These platforms are highly accessible among the current generation of young adults ranging from 18 to 30 years of age and have become a normal part of young adult life, with the amount of time spent on social media surpassing the amount of time spent on other daily activities (Vaterlaus et al., 2015). Although constantly growing and changing, social media serves as an interactive online reality in which identity is constructed and controlled (Fergie et al., 2017).

In particular, Instagram is a mobile photo and video-sharing application allowing users to apply filters to their posts and share them with hashtags or location tags to reach a broader population (Sheldon & Bryant, 2016). With the platform currently growing to the highest popular rank, Instagram has over one billion active users with 65 percent being between 18 and 35 years of age (Statista, 2020). The present study investigated social media use, particularly Instagram use, and whether it could be used to predict measures of self-esteem and narcissism in young adults.

Self-Esteem

Self-esteem is a subjective evaluation of an individual's worth as a person, involves feelings of self-acceptance and self-respect, and changes constantly in response to external events (Orth & Robins, 2014). Social media use affects self-esteem levels in both positive and negative ways. When focusing on the positive, Gonzales and Hancock (2011) demonstrated that self-esteem may be enhanced through exposure to one's profile, as individuals carefully edit their personal information and selectively present the aspects they want to emphasize. In other words, individuals are exposed to idealized versions of themselves through their personal social media accounts and interactions, and this carefully constructed online identity may be different from

the reality outside of online platforms (Wilson & Ross, 2001).

On the other hand, Vogel et al. (2014) conducted several studies investigating social media and self-esteem, with the results demonstrating undergraduate students who frequently use Facebook, as well as those who view and compare themselves to admirable individuals online, have poor trait self-esteem and self-evaluations. Individuals with low self-esteem are more anxious and introverted compared to those with high self-esteem. These individuals use Facebook as a valuable outlet for self-disclosure, as the face-to-face feelings of embarrassment and awkwardness associated with being undervalued by others is removed (Forest & Wood, 2012). Additionally, appearance expectations from others may have an influence on social media usage among young adults. Those who are dissatisfied with their appearances are not likely to share personal photos on social media whereas those who are satisfied with themselves share more (Barry et al., 2019).

Narcissism

Narcissism is a personality trait existing on a dimension across the normal population consisting of grandiosity, a need for admiration, and exaggerated views of the self (Mehdizadeh, 2010). When examining how narcissism may be manifested on Facebook and Twitter, researchers have found narcissism to be strongly correlated with behaviours relating to self-presentation, such as uploading photos of oneself, and has a significant relationship with usage intensity (Gnamb & Appel, 2017). Posting photos of oneself, or selfies, on social media platforms, may serve as an innovative and unique psychological function to maintain the self-regulatory behaviours enticing to narcissists (Weiser, 2015). Also, narcissists are concerned with creating multiple short-term relationships to maintain a popular, successful demeanor and can do so via highly controlled social networking sites, as friend and follower lists can sometimes reach the thousands (Buffardi & Campbell, 2008). Instagram, in particular, is an appealing platform to narcissistic individuals, as the environment of interactions is shallow and narcissists can exercise outright control over self-presentation through photo sharing (Sheldon & Bryant, 2016).

A study conducted by Moon et al. (2016) examined three subscales of the Narcissistic Personality Inventory 13 (NPI-13) on Instagram self-promoting behaviours. These factors included Leadership/Authority, Grandiose/Exhibitionism, and Entitlement/Exploitativeness. The sample included 212 participants, 110 of whom were female, originating in Korea with an average age of 28.8 years. The researchers hypothesized a positive relationship between narcissism and the frequency of posting photos of the self, keeping an updated profile, the rating of physical appearance, the amount of time spent on Instagram per day, the number of follower and following counts, and the total number of photos posted. The results confirmed high scores on the NPI-13 were associated with all measures of Instagram use, except the total number of photos posted. High scores on the Leadership/Authority and the Grandiose/Exhibitionism factors were predictors of Instagram self-promoting behaviour, whereas Entitlement/Exploitativeness was not (Moon et al., 2016).

Interactions between Self-Esteem and Narcissism with Social Media

Self-esteem and narcissism are closely associated, as the domination of narcissism on an individual's personality leaves them susceptible to increased sensitivity, ego threats, and in turn, fluctuating self-esteem levels based on the feedback they receive from others (Pincus et al., 2014). Individuals with vulnerable narcissistic traits, such as the reliance on positive feedback from others, increased sensitivity to rejection, and disguising their weaknesses may feel insecure and disconnected from others yet frequently engage in behaviours of posting photos with others in an attempt to appear well-known and accepted (Barry et al., 2019). Individuals who seek social approval through the use of social networking sites experience constant cycles of exposure to social comparisons. In the social comparison theory proposed by social psychologist Leon Festinger, there is a drive within individuals to evaluate themselves by examining their abilities and appearances in comparison to others (Festinger, 1957). In turn, social comparisons may compromise an individual's self-esteem and compel them to further seek social approval, beginning the cycle again (Vogel et al., 2014).

When focusing on narcissism and self-esteem collectively, researchers have studied the interactions of these variables on Instagram use. Paramboukis et al. (2016) differentiated between grandiose and vulnerable narcissism, suggesting grandiose narcissism involves prestige, extraversion, and aggression whereas vulnerable narcissism involves feelings of helplessness, shame, inadequacy, and hypervigilance when insulted. Individuals with pathological forms of narcissism display both grandiosity and vulnerability, with grandiose narcissism almost always accompanied by vulnerable aspects (Pincus & Lukowitsky, 2010). The researchers explored narcissism and self-esteem using open-ended questions related to the subjective evaluation, attitudes, and affective reactions regarding Instagram use behaviours. The results demonstrated a weak, positive correlation between grandiose narcissism and self-esteem, as well as a moderate, negative correlation between vulnerable narcissism and self-esteem. Grandiose narcissism was correlated with behaviours relating to positive self-presentation on Instagram, such as promoting personal well-being, while vulnerable narcissism was correlated to attention- and approval-seeking behaviours, such as requesting followers. Both correlations between narcissism and Instagram use were not strong, suggesting more research must be conducted in this particular area to determine whether social media use is associated with individuals at a psychological level. However, the weak relationship may imply that Instagram can be utilized by those with already existing narcissistic characteristics to maintain those driving behaviours, rather than being a platform to encourage narcissistic behaviours in any individual who would not normally have those tendencies (Paramboukis et al., 2016).

Gaps in the Literature

Several gaps in the literature suggest further research should be conducted in the area of human traits and social media. For instance, studies have concluded mixed results about the relationship between social media use and self-esteem, acknowledging that self-esteem can be both enhanced and hindered through the use of social media (Gonzales & Hancock, 2012; Vogel et al., 2014). Also, previous researchers have explored the relationship between human traits and the increasing phenomenon of social media use, but have limited their focus to certain platforms, such as Facebook (e.g., Gnambs & Appel 2017; Gonzales & Hancock, 2011; Vogel et

al., 2014). Research involving human traits and Instagram use behaviours has concentrated solely on subjective, open-ended constructs such as the affective attitudes and moods regarding personal Instagram use behaviours (Paramboukis et al., 2016). These open-ended constructs are not successfully operationalized through concrete definitions and thus, do not provide insight into explicit social media use behaviours and the effects they may have on human traits. Furthermore, when using Instagram, researchers suggested studying narcissism with self-esteem levels to determine possible reasons why individuals do or do not engage in self-promotional behaviours via social media (Moon et al., 2016).

Current Study

This research study was an extension of previous studies and explored the relation between Instagram and the abovementioned human traits of self-esteem and narcissism. Through the use of adapted self-report questionnaires as used by Vogel et al. (2014) to measure Facebook use, the purpose of this study was to investigate whether Instagram use was predictive of measures of self-esteem and narcissism in young adults. Instagram use behaviours were operationally defined as posting, liking, commenting, and the amount of time spent on the application, resulting in four distinct scores. If Instagram use could predict outcomes on measures of self-esteem and narcissism, then it was expected that high scores on the measure of Instagram use behaviours would predict high narcissism scores with a positive relationship between the variables, but not on the self-esteem measure, with no relationship between the variables.

Method

Participants

A total of 55 participants had their data included in the study. The initial sample consisted of 60 young adults, however, data from five participants were excluded as they did not thoroughly complete all questionnaires. Participants were recruited from all programs and years of study at the University of Guelph-Humber and Humber College through posters and Facebook groups pertaining to the University of Guelph-Humber, but not affiliated with it. Of the 55 participants included in the study, 45 identified as female, and participants were 18 to 29 years

of age ($M = 29.91$, $SD = 2.95$). All students who participated did so anonymously and consented to have their data included in the study, following course designation approval procedures by Humber College's Research Ethics Board with the code CD-0308.

Materials

Instagram use. Instagram use was defined by posting, liking, commenting, and the amount of time spent on the platform with each component being a separate predictor variable. These behaviours were measured using four questions previously created by Vogel et al. (2014) to assess Facebook use, but the questions were adapted to this study. The questions included Likert scale options from one to six in which participants rated their Instagram use behaviours, resulting in four different scores. Posting behaviour was measured by the question "How frequently do you post a picture on Instagram?" (1 = never or almost never; 2 = once a year; 3 = once a month; 4 = once a week; 5 = once a day; 6 = multiple times per day). Liking behaviour was measured by the question "How often do you like the posts of others on Instagram?" (1 = never or almost never; 2 = once a year; 3 = once a month; 4 = once a week; 5 = once a day; 6 = multiple times per day). Commenting behaviour was measured by the question "How often do you comment on the posts of others on Instagram?" (1 = never or almost never; 2 = once a year; 3 = once a month; 4 = once a week; 5 = once a day; 6 = multiple times per day). Finally, the amount of time spent on the platform was measured by the question "Approximately how many hours do you spend on Instagram per day?" (1 = less than one hour; 2 = one to two hours; 3 = three to four hours; 4 = five to six hours; 5 = seven to eight hours; 6 = more than eight hours).

Self-esteem. To assess self-esteem, participants completed the Rosenberg Self-Esteem Scale (Rosenberg, 1965), (see Appendix A), which is a standard self-esteem measure in psychological research for adult populations and takes an estimated time of five minutes to complete (Bingle et al., 2004). Fleming and Courtney (1984) established good reliability of the Rosenberg Self-Esteem Scale, with an internal consistency score of .88 and a test-retest reliability score of .82. When compared with single-item self-esteem measures, the Rosenberg Self-Esteem Scale demonstrates high convergent validity in different adult populations

(Robins et al., 2001). The Rosenberg Self-Esteem scale consists of 10 items assessing self-esteem. Participants responded using a four-point Likert rating scale ranging from one, strongly agree, to four, strongly disagree. Importantly, when this measure is scored, higher scores correspond to lower self-esteem whereas lower scores indicate higher self-esteem.

Narcissism. The Narcissistic Personality Inventory 16 (NPI-16) is composed of 16 pairs of items originating from the Narcissistic Personality Inventory 40 (NPI-40) and measures both grandiose and vulnerable qualities of narcissists, such as self-enhancement, feelings of entitlement, and demands for admiration in a time-saving manner. The NPI-16 has evident internal, discriminant, and predictive validity and is an adequately reliable instrument (Ames et al., 2006; Gentile et al., 2013). Each pair of items in the NPI-16 consists of two statements, one considered a narcissistic response, and another considered a non-narcissistic response. Participants were asked to choose one statement from each pair best representing themselves, and scores were coded as either one for a response consistent with narcissism or zero if it was inconsistent. The overall scores were calculated by adding up each statement consistent with narcissism. High scores indicated high levels of narcissism whereas low scores indicated low levels of narcissism. The item pairs are shown in Appendix B.

Procedure

Individuals who expressed interest in participating in this study through poster and Facebook group recruitment were provided with a link to Qualtrics through e-mail. Once participants clicked the study link, they were presented with an information letter clearly stating the nature of the study including the purpose and description of the research topic, any potential risks and benefits, confidentiality measures, and withdrawal and follow-up procedures. Upon reading the information letter online, participants were asked to provide consent displaying their understanding of the research process and the use of data. If participants refused to provide consent, they were directed out of the questionnaires and no data was collected. After participants provided informed consent, they were asked to provide their age and gender and were automatically redirected to three self-report questionnaires where they remained anonymous when answering. Following the completion of

their participation in this study, participants were debriefed, and if interested, provided with a summary of the research results.

Statistical Analyses

In this quantitative study, a correlational research strategy was used in which Instagram use behaviours served as predictor variables and were defined by posting, liking, commenting, and the amount of time spent on the platform. The measures of self-esteem and narcissism were used as the outcome variables. Each participant was asked to complete three self-report questionnaires administered online to assess their Instagram use behaviours, self-esteem levels, and narcissistic characteristics. All analyses were conducted using SPSS Statistics, Version 26. Data were analyzed using two stepwise multiple linear regression analyses to assess whether Instagram use was predictive of outcomes on measures of self-esteem and narcissism, as well as the relations between all variables. The analyses were chosen because of the ability to separate each predictor variable and analyze their possible effect on each of the outcome variables. Analyses were completed using a significance level of $\alpha = .05$. Table 1 presents the means, standard deviations, and maximum and minimum scores for posting, commenting, liking, and time spent on Instagram.

Results

Regression Model for Self-Esteem

A stepwise multiple linear regression analysis was used to predict self-esteem scores ($M = 20.96$, $SD = 5.49$, $Min. = 10.00$, $Max. = 40.00$) based on the behaviours of posting, liking, commenting, and time spent on Instagram daily. An analysis of standard residuals demonstrated that the data did not contain any outliers (Std. residual min = -2.178, Std. residual max = 2.680). The results revealed the data met the assumptions of collinearity (Posting, tolerance = .898, $VIF = 1.113$; Liking, tolerance = .644, $VIF = 1.553$; Commenting, tolerance = .676, $VIF = 1.479$; Time spent, variance = .780, $VIF = 1.281$). The data met the assumption of independent errors (Durbin-Watson value = 1.563). Data fit the characteristics of normality in reference to the histogram of standard residuals and the scatterplot of standardized predicted values. The data also met the assumption of nonzero variances.

The model demonstrated that spending time on Instagram was a significant predictor of self-esteem scores, $\beta = 2.673$, $F(1, 53) = 16.660$, $p = .000$, $R^2 = .239$. There was a moderate, positive correlation between the amount of time spent on Instagram and self-esteem scores, $r = .49$, $p < .05$. Importantly, when the Rosenberg Self-Esteem Scale measure was scored, higher scores indicated lower self-esteem whereas lower scores indicated higher self-esteem. As time spent on Instagram increased, self-esteem decreased, indicated by higher scores on the Rosenberg Self-Esteem Scale. Conversely, a decreased amount of time spent on Instagram was linked with higher levels of self-esteem, as indicated by lower scores on the self-esteem questionnaire. The behaviours of posting ($\beta = .032$, $t(53) = .258$, $p = .036$), liking ($\beta = .144$, $t(53) = 1.074$, $p = .288$), and commenting ($\beta = -.169$, $t(53) = -1.348$, $p = .183$) were not significant predictors of self-esteem scores and were removed from the model. Despite liking behaviour being an insignificant predictor of self-esteem scores, there was a moderate, positive correlation between the variables, $r = .33$, $p < .05$. As liking behaviour increased, self-esteem scores also increased, indicating lower self-esteem.

Regression Model for Narcissism

Another stepwise multiple linear regression analysis was used to predict narcissism scores ($M = 4.00$, $SD = 3.03$, $Min. = .00$, $Max. = 14.00$) based on the behaviours of posting, liking, commenting, and time spent on Instagram daily. An analysis of standard residuals revealed no outliers in the data (Std. residual min = -1.50, Std. residual max = 3.16). Multicollinearity was not a concern after testing the assumption of collinearity (Posting, tolerance = .898, $VIF = 1.113$; Liking, tolerance = .644, $VIF = 1.553$; Commenting, tolerance = .676, $VIF = 1.479$; Time spent, tolerance = .780, $VIF = 1.281$). The data met the assumption of independent errors (Durbin-Watson value = 2.255). Data fit the characteristics of normality in reference to the histogram of standard residuals and the scatterplot of standardized predicted values. The data also met the assumption of nonzero variances (Posting, variance = 1.904; Liking, variance = 1.421; Commenting, variance = 2.211; Time spent, variance = 1.010; Narcissism, variance = 9.185).

The model revealed a significant prediction of narcissism scores by the amount of time spent on Instagram, $\beta = -.990$, $F(1, 53) =$

6.403, $p = .014$, $R^2 = .108$. There was a moderate, negative correlation between the amount of time spent on Instagram and narcissism scores, $r = -.33$, $p < .05$. As time spent on Instagram increased, narcissism levels decreased, as indicated by lower scores on the narcissism questionnaire. The behaviours of posting ($\beta = .060$, $t(53) = .453$, $p = .652$), liking ($\beta = .029$, $t(53) = .198$, $p = .844$), and commenting ($\beta = .086$, $t(53) = .627$, $p = .534$) on Instagram were not significant predictors of narcissism scores, and therefore, were removed from the model.

Discussion

With the popularity and use of social media becoming increasingly prevalent, the influence of social media on ourselves as individuals has become a growing interest. Previous attempts at uncovering the relations between social media and human traits of self-esteem and narcissism have been limited to certain platforms, such as Facebook, and have reported mixed results (e.g., Gnamb & Appel 2017, Gonzales & Hancock, 2011; Vogel et al., 2014).

The present study demonstrates the predictive nature of Instagram use, particularly time spent on the platform but not posting, liking, or commenting, on human traits as discussed further below. The positive association between time spent on Instagram and self-esteem scores, indicating lower self-esteem, may be accounted for by frequent Instagram use and engaging in social comparisons on the platform. The negative association between time spent on Instagram and narcissism scores may be a result of narcissists having no intention of creating deep relationships or willingness to engage with others online.

Focusing on self-esteem, the amount of time spent on Instagram daily was a significant predictor of self-esteem scores, whereas posting, liking, and commenting behaviours were not. This finding contradicted the original hypothesis that all Instagram use behaviours would not be predictive of self-esteem. Time spent on Instagram and self-esteem scores were positively associated, suggesting an increase in time spent on Instagram indicated an increase in self-esteem scores, meaning these individuals had lower self-esteem. A study by Forest and Wood (2012) suggested those with low self-esteem consider social media websites, like Facebook, as comfortable expression outlets. However, the findings are consistent with Vogel et al. (2014),

demonstrating those who use Facebook more frequently have poor self-esteem and self-evaluations, which may be a result of endless cycles of social comparisons to admirable individuals online. Self-enhancement and maintenance of a positive self-evaluation are both motives for social comparisons (Festinger, 1957). These motives can be achieved through likes and comments on social media, and on the other hand, those with low self-esteem may feel compelled to constantly spend time on Instagram to gain this social status, enhancing their self-view and self-evaluation.

A study conducted by Mackson et al. (2019) examined the relations between Instagram and psychological outcomes. Contrary to the present study, the results showed that individuals who have an Instagram account had higher self-esteem compared to those without an Instagram account. The researchers suggested that receiving positive feedback from others through likes and comments creates a perception of belongingness and social support in an individual (Mackson et al., 2019). If this is the case, then individuals feeling supported with relatively high and stable self-esteem may be more likely to engage in posting behaviour knowing they will receive positive feedback from others. However, there are no studies reviewing the likelihood of individuals to like and comment on the posts of others based on their self-esteem. Focusing on the post-secondary student population with Instagram accounts, the results of this study address the potential for Instagram use to impact self-esteem, and in turn, other aspects of life.

Contrary to the hypothesized association, the behaviours of posting, liking, and commenting on Instagram were not significant predictors of narcissism. The amount of time spent on Instagram was a significant predictor of narcissism scores and the results demonstrated a negative association between the variables. As time spent on Instagram increased, narcissism scores decreased, indicating lower narcissism levels. This finding contradicts previous work by Moon et al. (2016) demonstrating positive relationships between the amount of time spent on Instagram daily and scores on narcissism measures. The insignificant relations between posting, liking, and commenting behaviours with narcissism, as well as the negative association between spending time on Instagram and narcissism may be accounted for by several possibilities.

Previous studies examined a motive involving knowledge about others in which liking and commenting on posts were common and a function of the Grandiose/Exhibitionism and Entitlement/Exploitativeness factors of narcissism (Sheldon & Bryant, 2016; Singh et al., 2018). High numbers of likes and comments are also considered as having distinguishable status and popularity (Martinez-Pecino & Garcia-Gavilán, 2019). Despite Instagram being appealing to narcissists, they are less likely to interact with others beyond surface levels (Sheldon & Bryant, 2016). With no intention of deepening online relationships, narcissists may not spend time engaging with others by scrolling through their Instagram feed, liking, or commenting on the posts of others. Although likes and comments are considered visible recognition cues, no known studies suggest narcissists are likely to engage in this behaviour for the benefit of others. Instead, narcissists tend to focus more on behaviours relating to personal benefit and self-presentation, such as posting on the platform (Moon et al., 2016).

However, posting behaviour was not a significant predictor of narcissism. Unlike previous studies conducted by Gnambs and Appel (2017), as well as Moon et al. (2016), which have concluded that those high in narcissism tend to post more on Instagram, the results of this study demonstrate that posting is not necessarily predictive of narcissism. The insignificance of posting behaviour may be accounted for by the measured dimension focusing solely on the frequency of posting on Instagram, rather than the types of media being posted (i.e. selfies, group photos, photos of food, landscapes, etc.). If these dimensions were measured, it is possible there could have been a significant prediction of narcissism by posting behaviour, specifically selfies, as grandiose narcissistic traits are strong predictors of taking self-portraits (Koterba et al., 2020).

Strengths

This study is one of very few conducted assessing Instagram use behaviours quantitatively. Previously, researchers have limited their focus to certain platforms, such as Facebook (e.g., Gnambs & Appel 2017; Gonzales & Hancock, 2011; Vogel et al., 2014). Likewise, research involving Instagram has focused on qualitative aspects of Instagram use behaviours, such as attitudes and moods regarding the

platform (Paramboukis et al., 2016). As an extension of previous research, this study aimed to quantitatively investigate Instagram use behaviours in more depth and provides a foundation for future research involving Instagram use.

Limitations and Future Directions

Similar to other research, this study had limitations that should be taken into consideration. First, all data were collected through self-report questionnaires which have the potential to be false. Despite efforts to reduce falsely reported data through anonymity, it is possible participants answered the questionnaires in socially acceptable ways rather than truthfully, or potentially assessed their behaviours inaccurately. It is unknown whether objectively verified data would have produced different results. In addition to participants providing self-reported data, doing so online reduces the likelihood of answering in a controlled environment. Publicity and surrounding noise may influence how participants respond, such that noisy environments can result in distractions and the inability to focus and reflect on each question. A future direction of research may be assigning participants to monitored groups of low, medium, and high levels of Instagram usage activity. Then, participants can complete self-esteem and narcissism measures in which scores can be compared between groups to determine if different activity levels impact outcomes on these measures. For instance, researchers can focus on whether participants in the low-activity group have higher self-esteem compared to the high-activity group, as well as further examine narcissistic factors in relation to different levels of Instagram activity.

Next, the generalizability of the results is limited by the sample, as participation was restricted to students attending the University of Guelph-Humber or affiliated institutions. Participant recruitment through social media could potentially impact results because it does not consider individuals who do not regularly use social media. Likewise, the results may be underpowered and inaccurately reflect the behaviours of all young adults outside of the student population and Instagram users altogether, as well as individuals who do not usually use social media. Although they are among the most frequent users, young adults represent only a portion of all Instagram users. As of January 2020, 6.1 percent of Instagram users

were between the ages of 13 and 17, and 24.3 percent were between 35 and 54 (Statista, 2020). The current study addressed the normal population using non-clinical measures. It is possible to employ this information within therapeutic or clinical settings for atypical populations. A suggestion for future research involves considering different age groups. Focusing on younger populations and the period of adolescence, parents may monitor their child's behaviours to determine whether too much or too little time is spent using social media. However, this distinction remains unclear and research could benefit from distinct guidelines outlining normal and abnormal time limits. Once these are in place, findings may be used to determine indications of early abnormal psychological disorders, such as pathological forms of narcissism or any indications of anxiety, depression, or personality disorders based on self-esteem and the amount of time devoted to social media.

Additionally, the reliability and validity of the data are impacted by the instruments used for data collection. Tests of reliability and validity have not been conducted on the adapted Instagram use behaviour questionnaire as a result of this measure being created by previous researchers. In their study, Vogel et al. (2014) acknowledged the questionnaire strictly measured the frequency of Facebook use and did not take into consideration other dimensions of use, such as usage intensity, popularity on the platform, or the content that is normally engaged with. Likewise, the data in this study were constrained to only the frequency of behaviours and may not accurately reflect Instagram use altogether. A suggestion for future research is to examine Instagram use in more depth. Since Koterba et al. (2020) suggested having certain narcissistic traits are predictors of taking self-portraits, future studies can benefit from a standardized measure assessing not only the frequency of posting but the types of media being posted as well. From there, researchers can determine whether certain types of media attract more likes and comments compared to others in relation to human characteristics. Similarly, various types of media posted and the content that individuals follow could potentially impact results concerning self-esteem, such that following admirable individuals online, like models or celebrities, leads to social comparisons, and in turn, lower self-esteem compared to following those who share other types of content, such as nature photography

(Vogel et al., 2014). Furthermore, participants in this study completed only one measure assessing self-esteem and one measure assessing narcissism. When choosing appropriate measures for the current study, length and time constraints were of utmost concern. In the future, researchers should consider using various instruments assessing these traits, as well as consider longer versions with the ability to assess a wider range of each trait.

Conclusion

The present study sought to determine the predictive capabilities Instagram use has over the human traits of self-esteem and narcissism in young adults. The amount of time spent on Instagram was predictive of self-esteem and narcissism with positive and negative relationships between the variables, respectively. However, there were no significant relations between the behaviours of posting, liking, and commenting with either trait. The limitations include a restricted sample, self-reported data, and a lack of a reliable and valid instrument assessing Instagram use. Future research would benefit from the assessment of different populations and age groups. Also, a standardized Instagram use measure that examines online behaviours at an intense and in-depth level would be beneficial, such as assessing the types of media being posted and which types of media attract likes and comments. This study is one of very few conducted in this area and provides a starting point for further research.

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Table 1*Descriptive Data for Instagram Use Behaviours*

Factor	<i>M</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>
Posting behaviour	2.85	1.38	1.00	6.00
Liking behaviour	5.36	1.19	1.00	6.00
Commenting behaviour	3.42	1.49	1.00	6.00
Time spent on Instagram	1.91	1.01	1.00	6.00

Note. *M* = mean score; *SD* = standard deviation; *Min* = minimum score; *Max* = maximum score

Appendix A

Rosenberg Self-Esteem Scale (Rosenberg, 1965)

Rate the items using the following scale:

1 = *strongly agree* 2 = *agree* 3 = *disagree* 4 = *strongly disagree*

- ___ 1. I feel that I am a person of worth, at least on an equal basis with others.
- ___ 2. I feel that I have a number of good qualities.
- ___ 3. All in all, I am inclined to feel that I am a failure. *
- ___ 4. I am able to do things as well as most other people.
- ___ 5. I feel I do not have much to be proud of. *
- ___ 6. I take a positive attitude toward myself.
- ___ 7. On the whole, I am satisfied with myself.
- ___ 8. I wish I could have more respect for myself. *
- ___ 9. I certainly feel useless at times. *
- ___ 10. At times I think I am no good at all. *

*Reverse-scored

Appendix B

Narcissistic Personality Inventory 16 (Ames, Rose, & Anderson, 2006)

Narcissistic Response	Non-Narcissistic Response	NPI-40 Item
I know that I am good because everybody keeps telling me so	When people compliment me, I sometimes get embarrassed	4
I like to be the center of attention	I prefer to blend in with the crowd	7
I think I am a special person	I am no better or worse than most people	9
I like having authority over people	I don't mind following orders	12
I find it easy to manipulate people	I don't like it when I find myself manipulating people	13
I insist upon getting the respect that is due to me	I usually get the respect that I deserve	14
I am apt to show off if I get the chance	I try not to be a show-off	20
I always know what I am doing	Sometimes I am not sure of what I am doing	21
Everybody likes to hear my stories	Sometimes I tell good stories	23
I expect a great deal from other people	I like to do things for other people	24
I really like to be the centre of attention	It makes me uncomfortable to be the center of attention	30
People always seem to recognize my authority	Being an authority doesn't mean that much to me	32
I am going to be a great person	I hope I am going to be successful	34
I can make anybody believe anything I want them to	People sometimes believe what I tell them	35
I am more capable than other people	There is a lot that I can learn from other people	39
I am an extraordinary person	I am much like everybody else	40