Personality Traits as Predictors for the Negative Psychological Effects of Instagram

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Abstract

The present study sought to investigate the impact of personality traits on the negative psychological effects of Instagram and whether gender moderated this impact. Participants (n = 158) were recruited using convenience sampling via social media platforms. Using a cross-section study design, participants were asked to complete four questionnaires which assessed demographic and social media use, Big Five personality traits, self-esteem, and depression. Hierarchal multiple regressions and moderator analyses were conducted to address the aims of the study. The results did not indicate that the Big Five personality traits predicted negative psychological effects of Instagram. However, it was found that following beauty and/or fitness pages was a predictor for depression, but only for females. This finding leads to practical implications regarding the education of safe social media use and the importance of highlighting the potential psychological effects of following these beauty and fitness pages on Instagram. Future research should implement an alternative experimental study design to assess causation.

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Introduction

Social media and mental health

Mental health is an important and popular topic within psychology. According to a 2019 survey, 46% of people in Ireland report feeling stressed periodically, 35% report feeling anxious, and 21% report feeling depressed ("IACP releases findings", 2019). 38% of people say they have been affected by suicide in some way, up from 33% in 2016 ("IACP releases findings", 2019). These statistics are concerning. Since the outset of the Covid-19 pandemic in 2019, there is reason to believe that these numbers have risen drastically. Gavin, Lyne, and McNicholas (2020) predict a rapid increase of mental illnesses, as well as a potential increase for suicide, to be most prominent during the mid- and post-pandemic phases. With mental illnesses potentially on the rise and an overall decrease in people's well-being, it is important to examine the factors which affect mental health, so that we may implement changes and increase overall well-being. One factor of particular interest is social media usage. Social media is a relatively new domain within mental health research due to its recent advent. Subsequently, the research available for this subject is relatively lacking, although growing. As of 2020, Facebook and Instagram reported 2.7 billion and 1.16 billion monthly active users, respectively (Instagram Revenue and Usage Statistics, 2021). This ever-increasing population of social media users is extremely high and requires immediate and extensive research to be carried out to examine the influence and potential side-effects that social media may project on its users.

The current body of literature shows a positive correlation between social media use and mental illnesses. In a study by Lin et al. (2016) an association between social media use and depressive symptoms was found among young adults. However, these results only indicated a correlation between the two variables and could not identify the cause. The

authors suggest that perhaps people with depressive symptoms turn to social media for social validation or to escape unwanted feelings. In a similar study by Woods and Scott (2016), high levels of social media use were associated with poor sleep quality and high levels of depression and anxiety. It was also found that high levels of social media use were associated with lower levels of self-esteem. Once again, these results show a correlation without identifying a cause. Similar to the interpretation of results by Lin et al. (2016), perhaps people with low self-esteem use social media more as a way of seeking validation. However, while these studies failed to identify a cause, Allcott, Braghieri, Eichmeyer, and Gentzkow (2020) have reported that deactivating Facebook for four weeks improved subjective well-being in the participants, suggesting that social media can be damaging to an individual's well-being. Similarly, Keles, McCrae, and Grealish (2019) found time spent on social media to be a prominent risk factor in the development of anxiety, depression, and psychological distress. To understand why social media might cause such harmful psychological effects, it is important to examine the psychological processes which occur during its use.

Social comparison and its role in social media

Festinger's Social Comparison Theory (1954) proposed that individuals evaluate themselves by comparing themselves to others. Research has expanded on this theory by proposing two processes of social comparison: upward and downward comparison (Wheeler, 1966; Wills, 1981). Upward comparison involves comparing oneself to an individual who is perceived as superior, which may subsequently lower one's self-regard and damage their self-image (Wheeler, 1966). Conversely, downward comparison involves comparing oneself to an individual who is perceived as inferior or less fortunate, which may subsequently heighten one's self-regard and improve their self-image (Wills, 1981). Exposure to excessive levels of upward social comparison has been reported to produce an array of negative psychological effects, such as body dissatisfaction (Tiggemann & Polivy, 2010), eating disorders (Tylka &

Sabik, 2010), and depressive symptoms (Liu et al., 2017). Social media platforms such as Instagram and Facebook present the user with a perpetual stream of pictures and status updates, which provide filtered glimpses into the lives of others. However, these glimpses are not always an honest insight, as they often neglect the negative moments and tend to focus only on the highlights. Through the lens of Festinger's social comparison theory (1954), as well as the research on the impact of excessive upward comparison, it is reasonable to suggest that social media might be potentially harmful.

Vogel, Rose, Roberts, and Eckles (2014) found that prolonged exposure to these idealistic portrayals on Facebook create unhealthy amounts of upward social comparisons. These high levels of upward social comparison were found to be detrimental to an individual's well-being and self-esteem. Similarly, Chou and Edge (2012) found that long-term Facebook users believed that other people were happier and living better lives than they were. This distorted perception is believed to have been created by the positive messages and happy pictures that are regularly posted on Facebook. It was also found that having more Facebook friends, who were not known personally, strongly influenced the belief that others were living better lives (Chou & Edge, 2012). Frequent exposure to these highly curated social media profiles, which often depict false perceptions of perfect lives, might help to explain the results of Curran and Hill (2019), who found that levels of perfectionism in college students had risen between 1989 and 2016. Perfectionism has been conceptualised as a multidimensional personality trait, whereby the individual holds excessively high standards and is often overly critical of themselves (Curran & Hill, 2019). Further, Curran and Hill (2019) found that recent generations of college students do not only hold higher expectations of themselves, but they also report significantly higher levels of socially prescribed perfectionism than previous generations. The obsessive and competitive nature of social

media is believed to contribute to this external pressure to display perfection (Curran & Hill, 2019).

While perfectionism can often be healthy and beneficial, it can become neurotic and cause psychological and physiological harm (Hewitt & Flett, 1991). Neurotic perfectionism has been associated with eating disorders, depression, anxiety, obsessive-compulsive disorders, migraine, sexual dysfunction, and suicide (Blatt, 1995). McComb and Millis (2021) found that young women with moderate to high levels of physical appearance perfectionism reported significantly lower levels of weight and appearance satisfaction. The authors suggest that this dissatisfaction is caused by the excessive levels of upward appearance comparison to thin ideals perpetuated by Instagram models. Distorted body image can lead to other disorders, such as depression, anxiety, and a variety of eating disorders (McComb & Millis, 2021). Similarly, Turner and Lefevre (2017) found that high levels of Instagram use were associated with greater tendency towards orthorexia nervosa, an eating disorder where an individual obsesses over healthy eating. No other social media platform was found to have this effect. It is suggested that this association might be caused by the abundance of health and fitness-based Instagram pages which post a constant and curated feed of images portraying unrealistic body ideals and diets (Turner & Lefevre, 2017). Further, Sherlock and Wagstaff (2019) found that females who were exposed to beauty and health pictures on Instagram were more likely to measure lower in psychological well-being. Similar to Turner and Lefevre (2018), this decrease in well-being is believed to be a result of the unrealistic ideals which these beauty and fitness pages promote (Sherlock & Wagstaff, 2019). This feed of beauty and fitness images on Instagram can act as a self-evaluation tool through means of social comparison.

Personality traits influence on mental health and social media use

While research has shown that social media use can cause harmful psychological effects, the impact differs among its users. One reason for this could be the influence of certain personality traits. It has been found that certain personality traits are associated and may even contribute to the onset and course of mental illnesses. Klein, Kotov, and Bufferd (2011) found that individuals who scored high in neuroticism and low in extraversion and conscientiousness were prone to depression and anxiety disorders. High levels of neuroticism predicted the onset of depression. Low extraversion had a strong positive association with dysthymia, and a moderate positive association with major depressive disorder, while conscientiousness shared a strong negative association with all depressive disorders. Similar results were found by Goodwin and Gotlib (2004) who found that high levels of neuroticism were significantly associated with an increased risk of depression. However, this was only true for females. They reported that females tend to score higher in levels of neuroticism, which partially accounts for the prevalence of depressive disorders among females. In a longitudinal twin study by Kendler, Gatz, Gardner, and Pederson (2006) neuroticism was found to be strongly related to the risk of lifetime major depressive disorder. The role of extraversion was deemed to be weak and insubstantial. Naragon-Gainey, Watson, and Markon (2009) found similar results which identified a strong association between high levels of neuroticism and depressive disorders. They also found that low levels of extraversion were strongly associated with social anxiety disorder.

Research has also indicated that certain personality traits influence individual's social media usage and behaviours. Seidman (2013) found that individuals with high levels of agreeableness and neuroticism used Facebook as a means of fulfilling needs to belong. High neuroticism and low conscientiousness best predicted accurate self-presentation. It is suggested that individuals with high neuroticism often have difficulties fulfilling social needs that social media platforms may help meet. Whaite, Shensa, Sidani, Colditz, and Primack

(2018) found that individuals high in neuroticism were prone to social isolation, whereas individuals high in extraversion and agreeableness were associated with lower odds of social isolation. Interestingly, conscientiousness had an interactive effect, whereby social media use and social isolation were linearly associated for those in the low conscientiousness group but not in the high group. Correa, Hinsley, and De Zuniga (2010) found that high scores in extraversion, and neuroticism were positively associated with increased social media use. Openness was also found to have a positive association with social media use; however, this was only true for females. Cocoradă, Maican, Cazan, and Maican (2018) reported that individuals with high levels of neuroticism, and low levels of conscientiousness and openness, are most likely to become addicted to their smartphones. This finding raises cause for concern, as research has repeatedly found high levels of neuroticism and low levels of conscientiousness to be associated with various mental health issues and increased social media use; indicating that individuals with high levels of neuroticism and low levels of conscientiousness are most susceptible to the harmful psychological effects of social media.

The current study

Research indicates that social media use can cause unhealthy behaviours and negatively affect mental health. Most studies available on the psychological effects of social media use are limited to Facebook. The limited research available on Instagram show that it is potentially more damaging than any other social media platform due to its primary function as an image-based website, which serves as an instrument for social comparison. Due to the large amounts of highly curated profiles which portray mostly, and often only, happy and perfect lives, the levels of upward social comparison that the user is exposed to could potentially be very damaging. Instagram influencers that specialise in fitness and beauty are deemed particularly damaging to self-esteem and body image. Most studies conducted on the psychological effects of Instagram typically use an all-female sample. Research also indicates

that certain personality traits predict the onset and course of depressive disorders and self-esteem issues, while also influencing social media usage. However, these traits as predictors may often be moderated by gender.

Therefore, the aim of this study is to examine whether certain personality traits can predict the negative psychological effects of Instagram. It will also assess whether the ability of personality traits to predict these effects differ between genders. These aims produce the following research questions and hypotheses:

Research question 1a: Do the Big Five personality traits predict levels of time spent on Instagram?

Hypothesis 1a: There is an association between the Big Five personality traits and time spent on Instagram every day (TSI).

Research question 1b: Does the ability of the Big Five personality traits to predict TSI differ between genders?

Hypothesis 1b: The ability of the Big Five personality traits to predict TSI differs between genders.

Research question 2a: Does TSI and following beauty and/or fitness pages on Instagram (FBP) predict depression scores?

Hypothesis 2a: TSI and FBP are associated with depression scores.

Research question 2b: Does the ability of TSI and FBP to predict depression scores differ between genders?

Hypothesis 2b: The ability of TSI and FBP to predict depression scores differs between genders.

Research question 3a: Does TSI and FBP predict self-esteem scores?

Hypothesis 3a: TSI and FBP is associated with self-esteem scores.

Research question 3b: Does the ability of TSI and FBP to predict self-esteem scores differ between genders?

Hypothesis 3b: The ability of TSI and FBP to predict self-esteem scores differs between genders.

Methods

Participants

The current study recruited 158 participants, of which 62% were female (n = 98) and 38% were male (n = 60). Participants were aged 18 years and above (*m* = 36.56, *SD* = 13.85) and completed a minimum of lower secondary education. 51.9% of participants reported a bachelor's degree as their highest level of education (n = 82). There was a total of 11 countries of residence reported in this study, with 80.4% of participants residing in the Republic of Ireland (n = 127). Participants were selected using a convenience sampling method, whereby the researcher posted a link to the study on Facebook and Instagram, along with details outlining the research.

Measures/ Materials

For the purpose of this study, participants required a computer or mobile device, adequate internet connection, and access to either Instagram or Facebook.

Demographic and Social Media Use

A short questionnaire to examine demographic information and social media use was created for the purpose of this study (see Appendix A). This questionnaire recorded information regarding age, gender, country of residence, and education, while assessing preferred social media platforms, time spent on Instagram, and whether the participant follows beauty and/or fitness pages on Instagram. The questionnaire was coded to skip Instagram-related questions should the participant answer "no" to having an Instagram account. This prevented the results of the Instagram-related questions from being impacted by non-Instagram users. A pilot study was carried out for this questionnaire prior to the collection of data, and adjustments were made to question 5 to improve understanding.

The Big Five Inventory-10 (BFI-10)

The Big Five Inventory-10 (BFI-10; Rammstedt & John, 2007) was used to measure personality traits among the participants. The inventory consists of 10 statements (see Appendix B), which are rated along a 5-point Likert scale to assess five personality traits. Each trait – extraversion, openness, conscientiousness, agreeableness, and neuroticism – is measured across two items, one of which is reverse scored. A statement such as "I see myself as someone who is reserved" is rated by the participant along the 5-point Likert scale, with answers ranging from "disagree strongly" to "agree strongly". Due to the assumption of tau-equivalence in the testing of Cronbach's alpha, the internal reliability of scales is often underestimated (Graham, 2005). This misrepresentation of reliability is often most noticeable in scales of few items (Graham, 2005). The Spearman-Brown coefficient is the preferred measure of internal consistency when assessing the reliability of scales with two items (Eisinga, Grotenhuis, Pelzer, 2012). While past research has found the BFI-10 to measure acceptable levels of internal consistency (Guido, Peluso, Capestro, & Miglietta, 2015), the current study failed to replicate these findings, with only extraversion (.59) measuring above .50 for the Spearman-Brown coefficient. This is a concerning finding and is discussed further in the discussion. Rammstedt and John (2007) reported that BFI-10 scores recorded substantial convergent and discriminant validity when compared to BFI-44.

Rosenberg Self-Esteem Scale (RSES)

The Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965) was used to measure levels of self-esteem among the participants. The scale consists of 10 statements regarding one's self-esteem (see Appendix C), such as "I take a positive attitude toward myself", which were to be ranked by the participants using a 4-point Likert scale, ranging from "strongly agree" to "strongly disagree". Statements 2, 5, 6, 8, and 9 were reverse scored. Higher scores in this scale indicate higher levels of self-esteem. The internal consistency of this

questionnaire was evaluated with Cronbach's (1951) alpha coefficient, with the RSES measuring a Cronbach's alpha of .84 within the present study. The RSES has also been found to have good predictive validity (Schmitt & Allik, 2005; Torrey, Mueser, McHugo, & Drake, 2000).

Depression Anxiety Stress Scale-21 (DASS-21)

The depression subscale of the Depression Anxiety Stress Scale-21 (DASS-21; Lovibond & Lovibond, 1995) was used to measure levels of depression. This non-clinical subscale consists of seven statements regarding how the participant felt over the past week (see Appendix D). Statements such as "I felt down-hearted and blue" were ranked using a 4-point Likert scale, with answers ranging from "never" and "almost always". Higher scores in this subscale indicate higher levels of depression. Henry and Crawford (2005) reported good convergent and discriminant validity for the DASS-21 when compared with other validated measures of depression and anxiety. Further, the depression subscale has shown good convergent validity when compared to Beck's Depression Inventory (Norton, 2007). The current study measured a Cronbach's alpha of .87 for the depression subscale of the DASS-21.

Design

A quantitative, cross-sectional research design was used for this study. For H1a and H1b, the Big 5 traits – extraversion, openness, agreeableness, conscientiousness, and neuroticism – are the predictor variables and TSI is the criterion variable. Gender is used as a moderator variable for H1b. For H2a and H2b, TSI and FBP are the predictor variables and depression is the criterion variable. For H2b, gender is used as a moderator variable. For H3a and H3b, TSI and FBP are the predictor variables and self-esteem is the criterion variable.

For H3b, gender is used as a moderator variable. Each hypothesis will be carried out using a hierarchal regression model, controlling for age, education, and gender.

Procedure

The present study obtained ethical permission from the ethical review board at the National College of Ireland. The study was completely anonymous and did not record any identifiable information regarding the participant. The participant was informed of the contents of the study, as well as their right to withdraw at any moment before or during the study without reprimand (see Appendix E). This study did not recruit any vulnerable people and required informed consent, ensuring no violation of the ethical procedures within the 'NCI Ethical Guidelines for Research with Human Participants' code of conduct. Further, the participants were provided with the numbers for helplines before and after the survey, should they have become distressed at any point during the study.

Before releasing the survey, a pilot study was conducted for the first questionnaire (see Appendix A). This questionnaire was tested using convenience sampling, with participants including friends and family of the researcher. Alterations were made to the phrasing of question 5 amidst mild confusion. Once satisfied that the questionnaire was understandable and deemed to adequately measure demographic information and social media use, the full survey was ready for release. A link to the study was posted on Instagram and Facebook with details briefly outlining the topic being studied, as well as an approximate time of the survey. The link brought the participant to the questionnaire, which was hosted on Microsoft Forms. Before beginning the survey, an information sheet (see Appendix E) was presented to the participant, which outlined the topic being studied, an approximate time of the survey, a statement outlining the confidentiality of the participant, an outline of the participant's rights, a warning that certain questions might trigger psychological distress, and

a series of resources should the participant become distressed. Due to a word count restriction, this information was split between the information sheet and the consent form (see Appendix F). The participant was then asked whether they had read and understood the information, to confirm they are aged 18 or over, and to voluntarily confirm their willingness to participate (see Appendix F). Once the participant gave their consent, they were brought to the first questionnaire of four. This questionnaire assessed demographic information and social media use (see Appendix A). The second questionnaire used the BFI-10 to measure Big 5 traits (see Appendix B). The third questionnaire used the RSES to assess levels of self-esteem (see Appendix C). The fourth and final questionnaire used the depression subscale of the DASS-21 to measure levels of depression (see Appendix D). Upon submitting the final questionnaire, a page was presented which thanked the participant for the participation before debriefing and presenting them with a series of resources again should they have become distressed by any questions asked during the surveys (see Appendix G). The survey took approximately seven minutes and 30 seconds to complete on average. To ensure confidentiality, email addresses were hidden from the researcher and no identifiable information was recorded. Further, to gain consent without recording a name, the consent form was coded to terminate the survey should the participant answer “no” to any of the questions on the consent form (see Appendix F).

Results

Descriptive Statistics

158 participants took part in the study, the majority of which were female (62%) and had completed a bachelor's degree as their highest level of education (51.9%). In order to make education a dichotomous variable, lower and higher secondary education were grouped together as "secondary education", while bachelor's degree, master's degree, and Ph.D or higher were grouped together as "bachelor's degree or higher". 80.4% of participants were Irish residents, while the remaining 19.6% were spread across 10 other nations. The ages of the participants ranged between 20 and 83 (m = 36.56, SD = 13.85). Instagram was the most used social media platform for the majority of the participants (51.3%), with participants spending a mean time of approximately 61 minutes on Instagram every day. 146 participants in this study had an Instagram account. Of these 146 Instagram users, 96 (65.8%) followed beauty and/or fitness pages on Instagram. Further frequency and descriptive statistics can be found in Table 1 and Table 2, respectively.

Table 1

Frequencies for Gender, Education, and FBP

Variable	Frequency	Valid %
Gender		
Female	98	62.0%
Male	60	38.0%

Education		
Secondary education	54	34.2%
Bachelor's degree or higher	104	65.8%
Following beauty/fitness pages		
Do follow	96	65.8%
Do not follow	50	34.2%

Note: Education = Highest level of education completed; FBP = Following beauty/fitness pages

Table 2

Descriptive Statistics for Age, TSI, Self-Esteem, and Depression

Variable	*M* [95% CI]	*Mdn*	*SD*	Range
Age	36.56 [34.38, 38.73]	31.00	13.85	20 – 83
TSI	60.56 [51.07, 70.05]	50.00	58.00	0 – 350
Self-esteem	19.09 [18.38, 19.81]	19.00	4.57	3 – 30
Depression	4.85 [4.28, 5.41]	4.50	3.59	0 – 21

Note: TSI = Time spent on Instagram

Inferential Statistics

Hypotheses 1a and 1b

(H1a) Hierarchal multiple regression was used to assess the ability of the Big Five personality traits – agreeableness, extraversion, conscientiousness, neuroticism, and openness – to predict TSI scores, after controlling for the influence of age, education, and gender. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity, and homoscedasticity. The correlations between the predictor variables and the criterion variable were examined (see Table 6). Tests for multicollinearity indicated that Tolerance and VIF values were in an acceptable range. Thus, indicating no violation of the assumption of multicollinearity. Age, education, and gender were entered in Step 1, explaining 20.9% of the variance in TSI scores. After entry of the Big Five personality traits at Step 2, the total variance explained by the model as a whole was 23.1%, F (8, 137) = 5.15, $p < .001$. The two control measures explained 2.3% of the variance in TSI scores, after controlling for age, education, and gender, R squared change = .02. F change (5, 137) = .81, $p = .542$. In the final model, only age was statistically significant, recording a higher beta value ($\beta = -.55$, $p < .001$) than the other measures (see Table 3). Thus, none of the Big Five traits significantly predicted TSI scores.

(H1b) A moderation analysis was conducted to assess the interaction effect of gender and the Big Five traits, following the hierarchal regression used in H1. The interaction variables were entered in Step 3, explaining 26.4% of the variance in TSI scores. However, no significant interaction effect was found for gender and the Big Five personality traits. McClelland, Irwin, Disatnik, and Sivan (2016) suggest that when looking for only the interaction effects, it is only necessary to report the values for the interaction variables and the r^2 of the model. Therefore, Step 3 of Table 3, 4, and 5 only report the relevant values of the interaction variables and r^2 of the model.

Table 3

Hierarchical Multiple Regression Analysis Summary Predicting TSI with Age, Education, Big Five Traits, and Interactions of Gender and Each of the Big Five Traits

Variable	R^2	R^2 Change	*B*	*SE*	*β*	*t*	*p*
Step 1	.21*						
Age			-2.16	.37	-.48	-5.80	<.001
Education			2.92	6.12	.04	.48	.634
Gender			-19.30	9.61	-.16	-2.01	.047
Step 2	.23	.02					
Age			-2.29	.40	-.51	-5.76	<.001
Education			2.48	6.29	.03	.40	.694
Gender			-20.16	10.07	-.17	-2.00	.047
Agreeableness			1.98	3.07	.05	.65	.520
Extraversion			4.32	2.46	.14	1.76	.081
Conscientiousness			-1.83	2.80	-.06	-.65	.515
Neuroticism			.96	2.42	.03	.40	.694
Openness			.861	2.76	.03	.31	.756
Step 3	.26	.03					
Agreeableness × Gender			-5.33	6.38	-.38	-.84	.405
Extraversion × Gender			.04	5.23	.00	.01	.994

Conscientiousness × Gender	.04	5.71	.00	.01	.994
Neuroticism × Gender	7.79	5.06	.50	1.54	.126
Openness × Gender	5.43	5.86	.40	.93	.356

Note: *TSI = Time spent on Instagram; R^2 = R-squared; β = standardized beta value; B = unstandardized beta value; SE = Standard errors of B; Statistical significance: *p < .05.*

Hypotheses 2a and 2b

(H2a) Hierarchal multiple regression was used to assess the ability of two variables – TSI and FBP – to predict levels of depression, after controlling for the influence of age, education, and gender. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity, and homoscedasticity. The correlations between the predictor variables and the criterion variable were examined (see Table 6). Only age was statistically correlated with depression (r = -.24, p = .001). Tests for multicollinearity indicated that Tolerance and VIF values were in an acceptable range. Thus, indicating no violation of the assumption of multicollinearity. Age, highest level of education, and gender were entered in Step 1, explaining 4.5% of the variance in levels of depression. After entry of TSI and FBP at Step 2, the total variance explained by the model as a whole was 6.9%, F (5, 140) = 2.08, p = .072. The two measures explained 2.4% of the variance in levels of depression, after controlling for age, education, and gender, R squared change = .02. F change (2, 140) = 1.83, p = .165. In the final model, only age (β = -.25, p = .019) was statistically significant when compared to the other variables within the regression. The results of this hierarchal regression can be seen in Table 4.

(H2b) Following the hierarchal regression used in H3, a moderation analysis was conducted to assess the interaction effect of gender on the predictor variables (TSI and FBP)

to predict levels of depression. After entering the interaction variables in Step 3, the total variance explained by the model was 12.6%, *F* change (2, 138) = 4.47, *p* = .013. No significant interaction effect was found for gender and TSI. However, the interaction between FBP and gender was found to be statistically significant (β = -.36, *p* = .005). PROCESS macro (Hayes, 2012, as cited in Field, 2013) was used to examine the conditional effects of this interaction. The conditional effect of FBP on depression showed corresponding results. Only females had a significant conditional effect (β = *.36, p* = .002), indicating a positive interaction effect between females and FBP when predicting levels of depression.

Table 4

Hierarchical Multiple Regression Analysis Summary Predicting Levels of Depression with Age, Level of Education, Gender, TSI, FBP, Interaction of Gender and TSI, and Interaction of Gender and FBP

Variable	R^2	R^2 *Change*	*B*	*SE*	β	*t*	*p*
Step 1	.05						
Age			-.06	.03	-.22	-2.46	.015
Education			-.55	.42	-.11	-1.32	.189
Gender			-.38	.65	-.05	-.59	.558
Step 2	.07	.02					
Age			-.07	.03	-.25	-2.38	.019
Education			-.57	.41	-.12	-1.37	.172

	Gender		-.56	.67	-.08	-.84	.405
	TSI		.01	.01	.08	.82	.414
	FBP		1.19	.67	.16	1.79	.076
Step 3		.13* .06					
	TSI × Gender		.01	.01	.09	.63	.529
	FBP × Gender		-3.63	1.27	-.36	-2.86	.005

Note: *TSI = Time spent on Instagram; FBP = Following beauty/fitness pages on Instagram; R^2 = R-squared; β = standardized beta value; B = unstandardized beta value; SE = Standard errors of B; Statistical significance: *p < .05.*

Hypotheses 3a and 3b

(H3a) Hierarchal multiple regression was used to assess the ability of two variables – TSI and FBP – to predict levels of self-esteem, after controlling for the influence of age, education, and gender. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity, and homoscedasticity. The correlations between the predictor variables and the criterion variable were examined (see Table 6). Once again, age was the only variable to be significantly correlated with the criterion variable. Tests for multicollinearity indicated that Tolerance and VIF values were in an acceptable range. Thus, indicating no violation of the assumption of multicollinearity. Age, highest level of education, and gender were entered in Step 1, explaining 7.7% of the variance in levels of self-esteem. After entry of TSI and FBP at Step 2, the total variance explained by the model as a whole remained as 7.7%, F (5, 140) = 2.33, p = .045. The two measures explained 0% of the variance in levels of depression, after controlling for age, education, and gender, R squared change = .00. *F change* (2, 140) = .02, p = .98. In the final model, only age and

gender were statistically significant, with the former recording a higher beta value ($\beta = .39$, $p < .001$) than the other measures (see Table 5). Neither TSI nor FBP significantly predicted self-esteem scores.

(H3b) Following the hierarchal regression used in H5, a moderation analysis was conducted to assess the interaction effect of gender on TSI and FBP to predict levels of self-esteem. The interaction variables were entered in Step 3, explaining 8.2% of the variance in self-esteem. However, no significant interaction effect was found for either gender and TSI or gender and FBP.

Table 5

Hierarchical Multiple Regression Analysis Summary Predicting Levels of Self-Esteem with Age, Level of Education, Gender, TSI, FBP, Interaction of Gender and TSI, and Interaction of Gender and FBP

Variable	R^2	R^2 Change	*B*	*SE*	β	*t*	*p*
Step 1	.08*						
Age			.10	.03	.28	3.16	.002
Education			.94	.52	.15	1.83	.070
Gender			1.46	.81	.16	1.80	.074
Step 2	.08	.00					
Age			.10	.04	.29	2.76	.007
Education			.95	.52	.15	1.81	.072

	Gender			1.85	.81	.20	2.27	.025
	TSI			-.00	.01	.00	-.00	.998
	FBP			-.18	.84	-.02	-.22	.830
Step 3		.08	.01					
	TSI × Gender			-.01	.02	-.07	-.48	.636
	FBP × Gender			1.08	1.65	.08	.66	.511

*Note: TSI = Time spent on Instagram; FBP = Following beauty/fitness pages on Instagram; R^2 = R-squared; β = standardized beta value; B = unstandardized beta value; SE = Standard errors of B; Statistical significance: *p < .05.*

Table 6

Inter-Correlations (Pearson's r) Between Model Variables

	1	2	3	4	5	6	7	8	9	10	11	12
1. Age	-											
2. Education	-.24*	-										
3. Gender	-.36**	.05	-									
4. TSI	-.43**	.15	.01	-								
5. FBP	.32**	-.08	.09	-.24*	-							
6. Agreeableness	.06	-.02	-.08	.04	-.10	-						
7. Extraversion	.22*	.06	-.04	.03	-.09	.22*	-					
8. Conscientiousness	.25*	.10	-.20*	-.10	-.07	.27*	.23*	-				
9. Neuroticism	-.02	-.01	-.16*	.05	-.08	-.21*	-.13	-.10	-			
10. Openness	.13	-.08	-.06	-.06	.08	-.27*	.01	.11	.20*	-		

11. Self-esteem	.19*	.09	.06	-.10	.08	.38**	.27*	.30**	-.45**	-.08	-
12. Depression	-.18*	-.06	.02	.13	.06	-.30**	-.37**	-.30**	.39**	.19*	-.59**	-

*Note: TSI = Time spent on Instagram; FBP = Following beauty/fitness pages; *p < .05; **p < .001*

Discussion

The purpose of this study was to examine how the Big Five traits predicted the negative psychological effects of Instagram and the role of gender as a moderator variable. With the use of prior research, three main hypotheses were formed to address the aims of the current study.

Firstly, we hypothesised that the Big Five traits would predict TSI scores (H1a), and that gender would moderate this effect (H1b). The results of this study failed to support either hypothesis, with none of the Big Five traits predicting TSI at a significant level. These results are inconsistent with previous research by Correa et al. (2010), who found that high neuroticism, extraversion, and openness predicted high levels of social media use, with gender moderating the effect of openness. However, it should be noted that the BFI-10 measured poor internal consistency within the present study, making it difficult to draw conclusions from these results. Another potential explanation for the lack of significant findings might be the timing of the study, as social media use has been found to be increasing as a result of Covid-19 lockdowns (Lemenager et al., 2021). This might have impacted the results of the current study by participants measuring high in TSI regardless of their personality traits. The final model for this study indicated that only age was a significant predictor of TSI, with younger ages measuring higher levels of TSI. This supports the findings of Correa et al. (2010) who found age to significantly predict time spent on social media.

Secondly, we hypothesised that TSI and FBP would predict levels of depression (H2a), and that gender would moderate this effect (H2b). The results failed to support either hypothesis. However, gender was found to moderate the ability of FBP to predict levels of depression, with females measuring higher in depression scores when following beauty

and/or fitness pages. This effect was not found for males. These results partly support the findings of Sherlock and Wagstaff (2019), who reported a negative association between exposure to beauty and fitness pictures on Instagram and psychological well-being within a female population. Although, they also found a positive correlation between TSI and depressive symptoms, which was not replicated in this study. Previous research has suggested the impact of social comparison as a mediator variable for TSI and depression (Lup, Trub, & Rosenthal, 2015; Sherlock & Wagstaff, 2019). Therefore, the inclusion of social comparison as a mediator variable might have helped to find significant values within the present study. While the study by Sherlock and Wagstaff (2019) used an all-female sample, the inclusion of males within the sample of the current study helps expand our knowledge on the subject. The findings indicate that FBP does not significantly predict levels of depression without the interaction effect of gender. Once again, only age was found to be a significant predictor in the final model.

Finally, we hypothesised that TSI and FBP would predict levels of self-esteem (H3a) and that gender would moderate this effect (H3b). Once again, the results failed to support either hypothesis, with none of the predictor or interaction variables measuring a significant value. Whereas previous research has found a negative correlation between social media use and self-esteem (Sherlock & Wagstaff, 2019; Vogel et al., 2014; Woods & Scott, 2016), the present study failed to find a significant correlation between the two variables. Consistent with the findings of Sherlock and Wagstaff (2019), the current study did not find a significant correlation between exposure to beauty and fitness pictures on Instagram and self-esteem. It was believed that focusing on consistent exposure to these pictures, rather than isolated exposure such as the method in Sherlock and Wagstaff (2019), would predict low self-esteem. Failure to support this hypothesis might be a result of the negative psychological

effects caused by the global pandemic (Gavin et al. 2020; Fruehwirth, Biswas, & Perreira, 2021). In the final model, only age and gender significantly predicted self-esteem.

Implications

The results of the current study were mostly nonsignificant. However, there are still practical implications to be made from the findings. The current study has extended our knowledge on the relationship between FBP and depression, with a positive association between the variables only found for females. While the current study did not find a causal link between FBP and depression, experimental studies, such as that by Sherlock and Wagstaff (2019), indicate that short-term exposure to beauty and fitness pictures increases depressive symptoms. Therefore, it is reasonable to suggest that chronic exposure to these images, through means of FBP, could cause the increase in depressive symptoms for females found within the present study, although further research is required to support this claim. These results indicate some potential practical implications. For example, further effort should be made regarding the education of safe social media use, particularly, yet not exclusively, for the female population, who appear to be at a greater risk of psychological harm as a result of FBP. As age was found to be negatively associated with TSI within the current study, interventions by means of education should be implemented at an early age. Moreno, Egan, Bare, Young, and Cox (2013) suggest that parents should begin educating their children between ages 6 to 8 on internet safety for maximum effectiveness. Additional educational programmes within schools could help further develop safe online behaviour (Moreno et al., 2013). The results of the current study indicate that this education of internet safety should incorporate a section regarding beauty and fitness pages on Instagram and the harmful psychological effect they can have. Further, it could also have implications for interventions regarding depression, as FBP might be a contributing factor. It might be of interest to therapists to assess whether the patient is following these pages and whether that

has an effect on their mental health. However, further research is required to examine the effects of FBP on depression at a clinical level.

Strengths and Limitations

One of the strengths of the current study is the inclusion of both males and females within the sample. Past research which focuses on the psychological effects of TSI and exposure to beauty and fitness pictures via Instagram typically use all-female samples. The inclusion of males within the sample of the current study allowed the researcher to examine the how results might differ between gender. Further, the use of a moderator analysis allowed for deeper understanding of these differences. This helps extend our knowledge on the effects of TSI and FBP on psychological well-being. Another strength of the present study was the use of a large sample size, which helps assess results with more accuracy. Additionally, conducting the survey online with complete anonymity for the participant may have produced more honest answers than if it had been held in-person (Joinson, 1999), allowing for more accurate findings.

While the study has its strengths, there are three main limitations which require attention. Firstly, as the BFI-10 measured poor internal consistency, it is difficult to make any conclusions regarding the results of the first study, as the items within the scale were not adequately measuring the desired constructs. While the BFI-10 has measured acceptable levels of internal consistency in previous studies (Guido et al., 2015), two-item scales can suffer from low internal consistency (Eisinga et al., 2012; Graham, 2005). Future research might consider using scales with more items, such as the BFI-44 (John, Donahue, & Kentle, 1991, as cited in Rammstedt & John, 2007), to reduce risk of measuring low internal consistency, which in turn might help with finding significant results.

Secondly, the use of a cross-sectional design within the current study means that only an association, rather than causation, can be inferred (Sedgwick, 2014). As most findings were nonsignificant, this is not a major limitation. However, it was found that gender moderated FBP on depression at a significant level. The use of cross-sectional design prevented any causal inferences from being made about this finding. Previous experimental research has indicated causal effects of exposure to beauty and fitness pictures on Instagram on depressive symptoms (Sherlock & Wagstaff, 2019). Therefore, it is reasonable to suggest that FBP may affect depressive symptoms when moderated by gender. Although, this is no more than a suggestion and future research should implement alternative study designs to allow the researcher to determine any causation. Longitudinal study designs which examine depression levels before and after FBP might better determine the strength of any causation.

Finally, the timing of the study may have potentially hindered the results. As the survey was administered during a period of social restrictions as a result of the Covid-19 pandemic, people might have subsequently been spending more time on social media, regardless of personality traits. This explanation is supported by the findings of Lemenager et al. (2021) who found that 71% of participants in a German sample reported an increase in online media consumption during a Covid-19-related lockdown. Similarly, as research suggests the mental health might be negatively affected by the pandemic (Gavin et al., 2020; Fruehwirth et al., 2021), it is possible that self-esteem and depression might be impacted as a result. Further, as self-esteem has been found to be impacted by social relationships (Harris & Orth, 2020), the lack of social interaction during Covid-19-related lockdowns might partially explain the lack of significant findings, as self-esteem might be low for those with low TSI due to a lack of social interaction, which may subsequently disturb the results of the current study.

Conclusion

To the researcher's knowledge, the current study was the first of its kind to examine how personality traits might predict negative psychological effects of Instagram. The study did not find evidence to suggest that personality traits predict self-esteem or depression scores as a result of Instagram use. However, the results of the study do suggest that FBP is a predictor of depression for females, but not for males. This finding contributes to the current understanding of the negative psychological effects of Instagram, while highlighting the importance of early education on Internet safety. Future research might benefit from the use of longitudinal study design to further assess the true impact of FBP on psychological well-being.

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Appendices

Appendix A

Demographic and Social Media Use Questionnaire

1. What age are you?

   _____

2. What is your gender?

   ◯ Female

   ◯ Male

   ◯ Non-binary

   ◯ Prefer not to say

3. In what country do you reside?

   _____

4. What is the highest degree or level of school you have completed?

   If currently enrolled, please select the highest degree received.

   ◯ No formal education

   ◯ Primary education

   ◯ Lower secondary education

   ◯ Higher secondary education

   ◯ Bachelor's degree

   ◯ Master's degree

   ◯ Ph.D or higher

5. Please place the following social media platforms in order based on your frequency of use.

1 = the platform you use most frequently; 2 = the platform you use second most frequently; ... 5 = the platform you use least frequently

	1	2	3	4	5	Do not use
Instagram	◯	◯	◯	◯	◯	◯
Facebook	◯	◯	◯	◯	◯	◯
Twitter	◯	◯	◯	◯	◯	◯
Tik Tok	◯	◯	◯	◯	◯	◯
Snapchat	◯	◯	◯	◯	◯	◯

6. Do you have an Instagram account?

   ◯ Yes

   ◯ No

7. On average, how many minutes do you spend on Instagram per day?

   _____

8. Do you follow any fitness or beauty pages on Instagram?

   ◯ Yes

   ◯ No

Appendix B

Big Five Inventory

How well do the following statements describe your personality?

I see myself as someone who…

	Disagree Strongly	Disagree a little	Neither agree nor disagree	Agree a little	Agree strongly
1. …is reserved.	◯	◯	◯	◯	◯
2. …is generally trusting.	◯	◯	◯	◯	◯
3. …tends to be lazy.	◯	◯	◯	◯	◯
4. …is relaxed, handles stress well.	◯	◯	◯	◯	◯
5. …has few artistic interests.	◯	◯	◯	◯	◯
6. …is outgoing, sociable.	◯	◯	◯	◯	◯
7. …tends to find fault with others.	◯	◯	◯	◯	◯
8. …does a thorough job.	◯	◯	◯	◯	◯
9. …gets nervous easily.	◯	◯	◯	◯	◯
10. …has an active imagination.	◯	◯	◯	◯	◯

Appendix C

Rosenberg Self-Esteem Scale

Below is a list of statements dealing with your general feelings about yourself. Please indicate how strongly you agree or disagree with each statement.

	Strongly Agree	Agree	Disagree	Strongly Disagree
1. On the whole, I am satisfied with myself.	◯	◯	◯	◯
2. At times I think I am no good at all.	◯	◯	◯	◯
3. I feel that I have a number of good qualities.	◯	◯	◯	◯
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 certainly feel useless at times.	◯	◯	◯	◯
7. I feel that I'm a person of worth, at least on an equal plane with others.	◯	◯	◯	◯
8. I wish I could have more respect for myself.	◯	◯	◯	◯
9. All in all, I am inclined to feel that I am a failure.	◯	◯	◯	◯
10. I take a positive attitude toward myself.	◯	◯	◯	◯

Appendix D

Depression Scale

Please read each statement and select how often the statement applied to you over the past week.

	Never	Sometimes	Often	Almost Always
1. I couldn't seem to experience any positive feeling at all.	◯	◯	◯	◯
2. I found it difficult to work up the initiative to do things.	◯	◯	◯	◯
3. I felt that I had nothing to look forward to.	◯	◯	◯	◯
4. I felt down-hearted and blue.	◯	◯	◯	◯
5. I was unable to become enthusiastic about anything.	◯	◯	◯	◯
6. I felt I wasn't worth much as a person.	◯	◯	◯	◯
7. I felt that life was meaningless.	◯	◯	◯	◯

Appendix E

Information Sheet

The purpose of this study is to examine whether certain personality traits can predict the negative psychological effects of Instagram. This will be measured through a series of four short questionnaires, which will investigate demographic and social media use, personality traits, self-esteem, and depressive symptoms. The entire survey will take 7 minutes on average.

The information recorded during this survey is in no way identifiable to the participant and is only accessible to the researcher and the project supervisor. You can withdraw from the study at any moment without penalty. To do this, just close the browser window and any information given will not be recorded. However, once your responses are submitted, it will no longer be possible to withdraw them as the data is anonymous. Please answer truthfully throughout.

Thank you for your participation.

Appendix F

Consent Form

What will taking part involve?

If you decide to take part in this research, you will be asked to complete four questionnaires. The first questionnaire will involve general demographic information and social media use. The second survey will involve questions regarding certain personality traits. The third survey will involve questions related to self-esteem and the fourth and final questionnaire will examine depressive symptoms. The entire study will take approximately 7 minutes to complete.

Do I have to take part?

Participation in this research is voluntary; you do not have to take part, and a decision not to take part will have no consequences for you. If you do decide to take part, you can withdraw from participation at any time by closing the tab. If you withdraw during the survey, all answers you had given will be deleted. Once you have submitted your questionnaire, it will not be possible to withdraw your data from the study, as the questionnaire is anonymous and individual responses cannot be identified.

What are the possible risks and benefits of taking part?

There are no direct benefits to you for taking part in this research. However, the information gathered will contribute to research that helps us to understand the psychological effects of Instagram and the impact of personality traits on these effects. There is a small risk that some of the questions contained within this survey may cause minor distress for some participants. If you experience this, you are free to discontinue participation and exit the questionnaire.

Contact information for relevant support services are provided below and at the end of the questionnaire.

Will taking part be confidential and what will happen to my data?

The questionnaire is anonymous, it is not possible to identify a participant based on their responses to the questionnaire. All data collected for the study will be treated in the strictest confidence. Only the researcher and academic supervisor will have access to the data collected. Responses to the questionnaire will be stored securely in a password protected/encrypted file on the researcher's computer. Data will be retained for 5 years in accordance with the NCI data retention policy.

What will happen to the results of the study?

The results of this study will be presented in my final dissertation, which will be submitted to National College of Ireland.

Who should you contact for further information?

Séaghan Fisher (Researcher): x18104347@student.ncirl.ie

Dr Robert Fox (Supervisor): Robert.Fox@ncirl.ie

Support services

50808: Text "HELLO" to 50808 for anonymous text support.

Samaritans: Call 116 123 for over the phone support.

Pieta: Call 1800 247 247 or text "HELP" to 51444 for suicidal and self-harm support.

1. Have you read and understood the consent form?

   ◯ Yes

   ◯ No

2. Are you aged over 18 years old?

   By clicking "Yes" below, you attest that you are 18 years old or above.

   ◯ Yes

   ◯ No

3. Do you consent to participation in this study?

   By clicking "Yes" below, you are freely giving your consent to participate in this study.

   ◯ Yes

   ◯ No

Appendix G

Debrief sheet

Thank you for taking part in this study. The purpose of this study was to examine whether certain personality traits can predict the negative psychological effects of Instagram. During this survey, we measured social media usage, personality traits, self-esteem, and depressive symptoms. The information recorded during this survey is in no way identifiable to the participant. After reaching the required number of participants, we will analyse the collected data to answer the research questions. The results will then be presented in the researcher's dissertation, which will then be submitted for review.

Thank you again for taking part. If there is anything you would like to discuss in relation to this study, please feel free to do so by contacting the researcher or supervisor. If any of the questions asked during this survey caused feelings of distress, please use the support services provided below.

Contact Information

Séaghan Fisher (Researcher): x18104347@student.ncirl.ie

Dr Robert Fox (Supervisor): Robert.Fox@ncirl.ie

Support services

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