

Instagram Use, Fear of Missing Out and the Role of Self-compassion

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Abstract

Since the early 2000s, there has been an increased tendency among young adults to utilise social media (SM) websites as a means to feel a sense of connection with users worldwide. Previous research pointed out that being able to communicate within seconds on SM platforms entails various negative consequences for one's psychological well-being. The concept of self-compassion has been shown to potentially reduce the reliance on applications like Instagram and reduce the emotional attachment to being connected online. Hence, this study investigates the relationship between Instagram Use and the level of Fear of Missing Out (FoMO). It was hypothesised that self-compassion moderates this relationship. To measure this, a cross-sectional survey study was conducted. A total of 71 participants aged 18 to 29 were included in the study. The findings of the study revealed a significant positive relationship between Instagram Use and FoMO ($p < .05$). However, an insignificant moderation effect of the variable self-compassion on the relationship between Instagram Use and FoMO was identified ($p > .05$). Hence, the use of Instagram is indeed related to one's FoMO level and stresses the importance to further investigate factors that influence the relationship between Instagram Use and FoMO. The results provide a starting point for future research as the conducted research positively contributes to the understanding of the impact of SM on one's mental health.

Keywords: Instagram Use, fear of missing out, self-compassion, young adults, cross-sectional study design

Instagram Use, Fear of Missing Out and the Role of Self-compassion

Over the past two decades, the use of social media (SM) has expanded significantly, and it now includes a huge variety of social networking sites utilised by people all over the world (Auxier & Anderson, 2021). Nowadays, these websites shape how people communicate due to their steadily expanding popularity (French & Bazarova, 2017; Naslund et al., 2020). Although SM is used by the vast majority of individuals, particularly young adults, appear to be the most active and frequent users on SM platforms (Auxier & Anderson, 2021). Among this population, Instagram, Facebook, and Whats App are the most used platforms (French & Bazarova, 2017). Particularly Instagram's popularity rises among young adults who view and post pictures at least once a day (Faelens et al., 2021). Nevertheless, there is a considerable body of literature that has found a relationship between SM use and negative mental health outcomes, such as anxiety or depression (Naslund et al., 2020; Phillips & Wisniewski, 2021). In recent years, Fear of Missing Out (FoMO) has been repeatedly studied in the context of SM use (Hayran & Anik, 2021, Jabeen et al., 2023). Hence, understanding possible factors that might make using SM for well-being promotion is a primary goal in current research. This study aims to detect the extent to which Instagram users rely on SM platforms, examine how this may relate to FoMO, and identify if self-compassion influences this relationship.

Instagram Use

SM can be defined as an internet-based medium to create ideas, share content, and exchange information with followers and friends, hence fostering a sense of connection (Carr & Hayes, 2015; Auxier & Anderson, 2021). Roughly half of the world's population uses SM platforms to connect and communicate with others in everyday life (Naslund et al., 2020). For instance, Instagram is used by 1 billion individuals regularly (Faelens et al., 2021), and users fall in the age range of 18 to 29 years (Auxier & Anderson, 2021). Of these, 73% of young adults are viewing their Instagram accounts daily (Auxier & Anderson, 2021), as Instagram enables users to upload images and videos of themselves (Staniewski & Awruk, 2022). A feature that is introduced by Instagram, known as Stories, allows users to upload pictures or videos for 24 hours to their account, enabling them to share real-time glimpses of their daily experiences (Foroughi et al., 2021). Hereby, users's connection is fostered by liking or commenting on pictures, sharing photos, and following an unlimited number of people (Foroughi et al., 2021). Being updated about people's lives may initially appear positive, as social connections can benefit one's mental well-being (Vidal et al., 2020). However, being constantly connected and

habitually checking one's phone might cause users to experience various negative feelings caused by the use of Instagram (Foroughi et al., 2021; Naslund et al., 2020).

The use of Instagram causes individuals to experience negative emotions, such as social comparison, body dissatisfaction, and depression (Burnell et al., 2019; Faelens et al., 2021; Staniewski & Awruk, 2022). Faelens et al. (2021) identified that the number of followers on Instagram increases individuals' social comparison levels, leading users to think more negatively about their bodies. This means users tend to compare themselves to perfectly idealised standards on Instagram, as individuals are daily exposed to posts about other people's personal lives (Phillips & Wisniewski, 2021). The desire to match those standards leads individuals to rely more on the usage of SM (Foroughi et al., 2021). Relying on Instagram, being exposed to other people's personal lives, and comparing oneself with friends are shown to be positively correlated with depression and social anxiety (Foroughi et al., 2021). Additionally, a cross-sectional study by Burnell et al. (2019) identified a significant mediation effect of social comparison on the relationship between Instagram Use and depression. This mediation effect is caused by habitually checking images posted on SM (Burnell et al., 2019). As a result, individuals who rely on the SM website Instagram and constantly engage in social comparison, encounter the onset of mental complaints (Faelens et al., 2021; Hayran & Anik, 2021).

Instagram Use and Fear of Missing Out

Considering the prevalent display of idealised representations by individuals (Faelens et al., 2021) and the constant access to information about other people's lives, researchers have recently studied the concept of FoMO more frequently (Roberts & David, 2020; Tandon et al., 2022). This phenomenon refers to one's anxiety or worries about missing out on socially or individually fulfilling events that others may be having (Jabeen et al., 2023). Therefore, individuals are more prone to experience anxiety as they are in constant search for the best experience, and hence longing for constant connectivity to stay updated on what other people might be doing (Deniz, 2021). According to Maxwell et al. (2022), the concept of FoMO can be subdivided into state and trait FoMO. State FoMO refers to a person's fear within a specific situation, while trait FoMO can rather be explained as a personality of a person, developing over lifetime (Maxwell et al., 2022). FoMO has recently been studied rather as a state than a trait and depends on a person, based on the time of the day or a particular event that the person may experience (Maxwell et al., 2022). The term state FoMO is not just used in real-world contexts as initially but is more often applied to the online world as well (Faelens et al., 2021; Roberts &

David, 2020). Consequently, state FoMO can be triggered by various SM platforms that are used at a specific time of the day (Maxwell et al., 2022; Tandon et al., 2022).

Researchers have investigated one SM website, Instagram, in relation to FoMO and identified a positive correlation (Hayran & Anik, 2021). To stay connected as everyone else, users might rely on Instagram and use it more regularly, which on the other side, increases feelings of FoMO (Foroughi et al., 2022; Roberts & David, 2020). Instagram has a feature of posting stories daily which remain visible for 24 hours. As shown by Hayran & Anik (2021) and Jabeen et al. (2023), regularly seeing stories leads users to compare their lives to the experiences of others. Similarly, Foroughi et al. (2022) identified that high pressure to follow the modelled standards within the online world increases by relying on Instagram. Hence, comparing one's experiences to the ones of others triggers feelings of FoMO, as users fear to miss out on events that others might be having (Jabeen et al., 2023). Specifically, during recent years of being restricted from going out, an unreachable high standard of living a perfect life increased negative feelings of Instagram users while being connected (Hayran & Anik, 2021; Venegas-Vera et al., 2020).

Aside from the impact of individuals' standards for living an idealised life displayed on their Instagram account, the Covid-19 pandemic can be seen as another significant influence on people's SM use (Venegas-Vera et al., 2020). During this time, social networking sites were used to help people build their social capital and support relational closeness to others through online interactions, thus fulfilling the fundamental function of connection (Venegas-Vera et al., 2020). This means, there were fewer opportunities for real-life social interactions, which led to a higher reliance on Instagram for maintaining social relationships (Foroughi et al., 2022; Roberts & David, 2020). Instagram specifically facilitates unlimited followers and friends to enable users to stay connected (Hayran & Anik, 2021; Roberts & David, 2022). Additionally, since most of the corona regulations have already been dissolved in 2022, social events can take place again (Hayran & Anik, 2021). As a result, feelings of FoMO increase and consumers' general anxiety level continues to rise in a so-called vicious cycle (Hayran & Anik, 2021; Venegas-Vera et al., 2020). Especially after the pandemic, it is commonly believed that FoMO on events is more prevalent among young adults, which brings the need to investigate a potential third factor, such as individuals' attitudes toward themselves (Samios et al., 2022).

Self-compassion

A concept that has been shown to serve as a helpful internal process, enhances mental well-being and guides individuals in dealing with specific fears, is self-compassion (Cândea et al., 2018). The concept is defined as a positive self-attitude (Modica, 2019), including support for oneself in coping with difficult situations and cultivating self-kindness to accept one's suffering (Keyte et al., 2021). According to Cândea et al., (2018), being compassionate consists of three different qualities, self-kindness, common humanity, and mindfulness.

Being more mindful of thoughts and feelings is pointed out to be effective in seeing the unjustifiability of fears and insecurities (Phillips & Wisniewski, 2021). Engaging in acts of self-kindness and recognizing one's own struggles as part of shared human experience are essential components of self-compassion, which consequently has been shown to be beneficial for coping with life experiences (Phillips & Wisniewski (2021)). Accordingly, self-compassion seems to be a strength a human can possess that positively affects individuals in coping with various difficult life situations (Keyte et al., 2021; Phillips & Wisniewski, 2021).

Practising compassionate behaviour supports individuals in coping with the pressure of living an idealised fulfilling life displayed on SM websites such as Instagram (Hayran & Anik, 2021; Tylka et al., 2015). To explain this further, previous research identified that people with high levels of self-compassion reported more emotional stability, shielding their focus from social pressure, and consequently living a more meaningful and less fearful life (Samios et al., 2022). Moreover, research has shown that self-compassion decreases general pressure on oneself and increases one's confidence level (Tylka et al., 2015). The high pressure of adapting to other people's lives presented on the internet can be alleviated by cultivating emotional stability within oneself. Hence, individuals with higher levels of self-compassion might experience a reduced inclination to constantly compare their lives to others (Phillips & Wisniewski, 2021; Samios et al., 2022).

Assessing the influence of one's self-compassionate attitude results in a more comprehensive insight into individuals' Instagram Use and feelings of FoMO. As shown by Tylka et al. (2015), being self-compassionate reduces unpleasant feelings about oneself, not just in social situations but also by mindlessly scrolling on the internet. FoMO and self-compassion are closely related concepts, whereby it helps a person to deal with negative feelings such as anxiety if they practice self-compassion regularly (Phillips & Wisniewski, 2021). To put this in other words, FoMO and self-compassion seem to be negatively associated (Modica, 2019). Furthermore, individuals using Instagram could develop negative opinions of themselves when

they get in contact with appealing, prosperous, or socially desired photographs (Foroughi et al., 2021). Based on this, self-compassion might positively motivate SM website users to treat themselves with kindness and without judgment (Keyte et al., 2021). Consequently, considering the ever-increasing use of Instagram and its impact on users' feelings of FoMO, it is important to explore the potential positive impact of individual's self-compassion level, which might serve as a buffer in the relationship between Instagram Use and FoMO.

Current Study

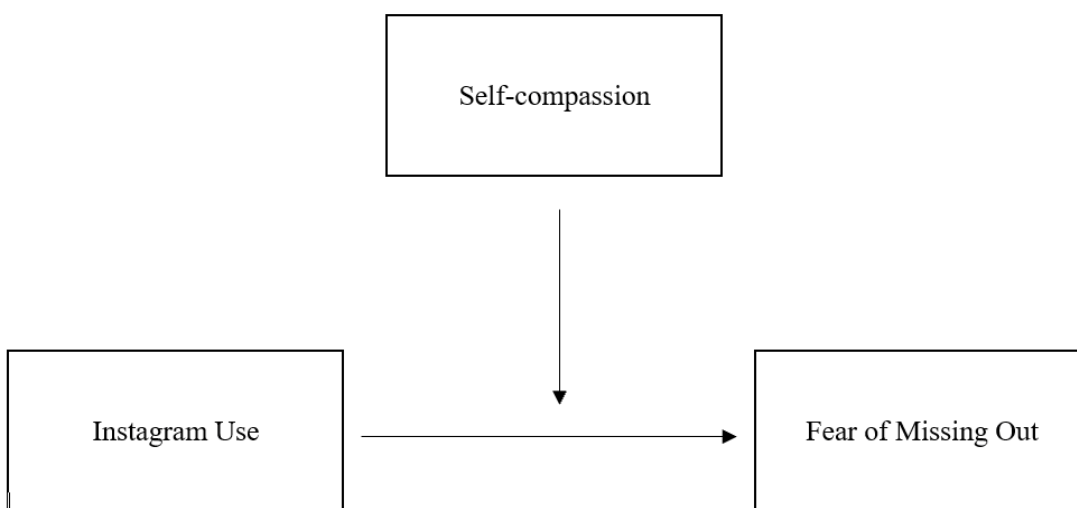
Taking the information at hand, negative mental health issues arise by using social websites regularly. This study focuses on Instagram, as it appears to be the newest application that has been widely adopted especially by young adults (Auxier & Anderson, 2021). While most research has focused on different mental health outcomes that arise from using Instagram, such as depression and anxiety (Phillips & Wisniewski, 2021; Vannucci et al., 2017; Vidal et al., 2020), this research specifically focuses on individuals' FoMO level. This phenomenon must be researched more in depth, given the recent onset of the Covid-19 pandemic (Roberts & David, 2020), and the increased usage of the Instagram application (Foroughi et al., 2022). Hence, it is crucial to investigate a third factor that people can actively work on in decreasing their FoMO on events. While other researchers have explored the influence of multiple third variables (Roberts & David, 2020; Tandon et al., 2022), this research uniquely focuses on the factor of self-compassion in influencing the relationship between Instagram Use and FoMO. In this case, self-compassion might change individuals' emotional responses toward pictures or videos posted on Instagram, decreasing one's FoMO level and one's reliance on SM applications. Accordingly, the research question can be phrased as follows: Is there a relationship between Instagram Use and Fear of Missing Out, and is this relationship moderated by self-compassion? Thus, the hypotheses to test the research question are formulated as

H1: High Instagram Use is associated with a higher level of Fear of Missing Out.

H2: Self-compassion weakens the association between Instagram Use and Fear of Missing Out.

Figure 1

Model of Research



Method

Study design

An online survey was conducted to examine the relationship between Instagram Use and FoMO by considering the indirect effect of self-compassion. The study design consisted of the independent variable Instagram Use, the dependent variable FoMO, and the moderating variable self-compassion.

Participants

In total, 82 participants have taken part in the study by following the link to access the questionnaire. They could either follow a link and get directed to an internet website or follow the Sona system of the University of Twente to get Sona points as a reward. Students must earn a total of 15 points to complete their bachelor's degree successfully. The recruitment process for the study was not only limited to the University of Twente Sona system, but also a snowball sampling method was applied. Specifically, potential partakers were encouraged to participate by reaching out to personal contacts, such as friends or family members. In addition, self-enrollment was facilitated by sharing the link on SM platforms such as Instagram and WhatsApp. Participants were required to be between 18 and 29, excluding 3 participants (3.66%), who exceeded the upper limit of this age range. Moreover, respondents were not included if they did not complete the study or did not provide informed consent (see Appendix A) before completing the questionnaire, resulting in the exclusion of 11 participants (13.41%). This led to a total of 71 participants out of the 82 respondents that could be included for further analysis purposes. Of

these, 46 (64.79%) were women, and 25 (35.21%) were men. 26 participants took less than 10 minutes to complete the questionnaire fully. In the survey, participants aged 18 to 29 were included, with a mean age of 21.72 (SD= 1.77). The majority of respondents were German and Dutch, comprising 88.73% in total. However, there was variability in nationality among participants, such as Finnish, Ukrainian, Mexican, Polish, and Belgian.

Materials

Next to collecting demographic data about the respondents, participants were invited to fill out the questionnaires. A phone, laptop, or computer were necessary materials for filling out the survey. Next to that, a stable internet connection to successfully get access to the link was needed. If these conditions were given, participants were asked to fill out three different questionnaires, namely the Social Media Use Integration Scale (SMUIS), Fear of Missing Out Scale (FoMOs), and the Self-compassion Scale short form (SCF-SF).

Instagram Use

The ten-item Social Media Use Integration Scale (SMUIS) was used to measure users' reliance on Instagram (Maree, 2017). To assess the level of Instagram usage, a five-point Likert scale was utilised, with 1 being representative of strongly disagree with the given condition and 5 being an indication of strongly agree. Higher scores indicate a greater integration of Instagram into one's daily routines and social behaviour. Conversely, lower scores indicate lower emotional attachment to the use of Instagram and less reliance on the application in one's daily life (Jenkins-Guarnieri et al., 2013). The questionnaire is specifically designed for young adults, perfectly applicable to this study's target group. Furthermore, the SMUIS scale comprised two distinct factors, with one factor aimed at measuring the degree of emotional attachment towards their friends and posts on SM. Participants with higher emotional attachment towards SM scored rather high on the item "I get upset when I can't log on to Instagram" (Maree, 2017). The second factor assessed an individual's integration of Instagram into one's routines. This included the extent to which an individual shares interests and activities with their followers (Sigerson & Cheng, 2018). The item "Using Instagram is part of my everyday routine" exemplifies how SM had become a habitual behaviour that is regularly incorporated into daily routines (Maree, 2017). Among the ten items included in the scale, only one item required reverse scoring to ensure consistency. The item "I don't like to use Facebook" needed to be scored in the opposite direction. Maree (2017) reported that the Social Media Use Integration Scale was adapted from two similar scales that measured Facebook usage. In this research, the wording of the items was

modified to measure Instagram usage instead, without compromising the scale's reliability (Jenkins-Guarnieri et al., 2013). Consequently, the test-retest reliability $r = .80$ indicated good reliability of this measurement tool. Regarding the scale's internal consistency, a Chronbachs alpha of .92 and .86 was found. (Sigerson & Cheng, 2018).

Fear of Missing Out

For measuring FoMO the Fear of Missing Out Scale (FoMOs) was used, which assessed the level of fear in everyday experiences (Przybylski et al., 2013). The questionnaire consisted of ten items in total, such as "I fear my friends have more rewarding experiences than me." or "When I have a good time it is important for me to share the details online" which reflects the emotional attachment to missing out on daily occasions with friends. To assess this, a five-point Likert scale was used that indicated the level of FoMO ranging from 1 (not at all true of me) to 5 (extremely true of me). Consequently, higher scores indicated higher levels of fear, a greater tendency to experience FoMO, and a greater inclination to rely on external sources to improve one's self-worth. On the other hand, lower scores suggested a more stable self-estimation without seeking external validation (Hayran & Anik, 2021; Przybylski et al., 2013). Of the ten items, no item needed to be reversed, meaning consistency within this scale was given. According to Przybylski et al. (2013), the internal consistency of the scale can be stated as $\alpha = .87$ to $.90$, which indicated good reliability of the questionnaire.

Self-compassion

The Self-compassion scale short form (SCF-SF) was used to assess the moderation variable self-compassion. As the name indicates, this scale is a short form to measure the level of self-compassion in individuals and consists of 12 items (Raes et al., 2011). These 12 items cover six topic areas that were randomly arranged in the questionnaire. The facets that are included are self-kindness, self-judgment, common humanity, isolation, mindfulness, and overidentification. An example item, representative of the aspect of self-kindness is "I try to be understanding and patient towards those aspects of my personality I don't like". Another example of self-judgment is "I'm disapproving and judgemental about my own flaws and inadequacies", the facet of common humanity was measured with the item "I try to see my failings as part of the human condition", and an example of the aspect isolation is "When I fail at something that's important to me, I tend to feel alone in my failure". Furthermore, the item "When something painful happens, I try to take a balanced view of the situation" measured mindfulness and lastly, the item "When I fail at something important to me I become consumed by feelings of inadequacy"

indicated the level of over-identification. The negative subscale items, namely self-judgment, isolation, and overidentification, needed to be reversed to compute the overall self-compassionate score of participants. To measure this, a five-point Likert scale was used, ranging from 1 (almost never) to 5 (almost always). As a result of this, participants could score low from 1 to 2.5, which was an indication of a rather low self-compassion score, 2.5-3.5 was indicative of a moderate level, and 3.5-5.0 was an indication of an extremely high self-compassion score (Raes et al., 2011). In other words, obtaining lower scores on the scale suggest that an individual was prone to self-judgment and demonstrated a reduced level of kindness towards themselves, whereas higher scores tend to indicate that the individual had a greater acceptance of their experiences as a natural part of human nature. The SCF-SF has been tested and found to be both reliable and valid for further use. Internal consistency was assessed by testing the scale among a wide range of individuals. According to Raes et al. (2011), a Chronbach's alpha of .86 and a very good correlation of $r = .97$ were identified.

Procedure

First, the platform 'Qualtrics' was used to develop the study. To then publish the study, ethical approval was required from the Ethics Committee of the BMS lab. In this case, ethical approval was necessary to ensure that participants were not exposed to any risks. After receiving approval and uploading the study to Sona, data collection could start. To provide additional demographic details, participants were directed to the Qualtrics.com platform upon clicking the link. Before proceeding with the survey, participants were required to provide informed consent, which allowed them to accept or deny their right to participate in the study. After giving informed consent, partakers were directed to the next page to indicate personal information, such as gender, age, and nationality. Lastly, a combined set of six questionnaires was presented for later assessment purposes.

Data Analysis

To analyse the data, the program R (V.4.3.0) was used (RStudio Team, 2020). For this, the complete R-script can be seen in the appendix (see Appendix B). The given data was cleaned by considering inclusion and exclusion criteria. In total 11 participants did not fall into the required age group or did not complete the study fully and were consequently excluded from the study. To determine the required sample size for this study, a G^* power analysis was conducted, revealing that a total of 34 participants were necessary (Kang, 2021). In the study, a total of 71 participants were included in the analysis, meaning that according to the power analysis, the

outcome yields statistically significant results. The significance level (α) for rejecting the null hypothesis when it is true is set at .05. Subsequently, all items that measured Instagram Use, FoMO, or Self-compassion were combined separately into one variable. In other words, for each of the three questionnaires, their respective sum scores were calculated, resulting in the creation of three variables within R. Hence, a complete data set was prepared to identify the relationship between Instagram Use and FoMO and analyse if this depends on an individual's self-compassion level.

A regression analysis was performed to test the assumptions of normality, linearity, independence, equal variance, and multicollinearity. Conducting this analysis shows that all assumptions are met if the variables can be modelled by a linear equation, the residuals are independent and not clustered, the variance of the residuals is equal, and the residuals are normally distributed. Pearson's correlation is an analysis used to assess the strength between the given variables, applicable if all assumptions were met. Pearson's correlation coefficient indicated the strength of the relationship, meaning that if the use of Instagram increases, the level of FoMO increases as well. Furthermore, a linear regression analysis was conducted. The regression analysis was used to answer the first hypothesis, which was phrased as: 'High Instagram Use is associated with a higher level of Fear of Missing Out.' Finally, to examine the potential moderating influence of the variable self-compassion, a linear multiple regression analysis was executed. This was representative of answering the second hypothesis, which was phrased as follows: 'Self-compassion weakens the association between Instagram Use and Fear of Missing Out.'

Results

Assumptions Testing

A linear regression analysis was performed to test for the assumptions, namely normality, independence, linearity, equal variance, and multicollinearity. The graph used to assess the assumption normality is slightly skewed to the right, yet interpreted as sufficient as the Shapiro Wilk test is significant ($W = .98, p > .05$). The assumption of independence was not violated, as there was no evidence of clustering in the residuals. To ensure this, the Durbin-Watson test was conducted to further test for potential violations. Therefore, it can be concluded that the residuals are independent, as no significant autocorrelations were found ($t(69) = 1.86, p > .05$).

Furthermore, a scatterplot was created to check for the assumptions of linearity, and no violation

was found. For equal variance, the Fligner-Killeen test was conducted, resultingly the assumptions did not seem to be violated as only significant p-values could be identified ($p > .05$). To examine the assumption of multicollinearity, VIF values were calculated and analysed. The assumption was met since all values were below the threshold of five. Hence, the analysis of the assumptions has revealed no violation, meaning all assumptions were met.

Descriptive Statistics

Descriptive analyses were performed to outline the characteristics of the participants in terms of three variables of interest: Instagram Use, FoMO, and Self-compassion. In Table 1 the results of the analyses are visible. With this, it is noteworthy that the scale range for both FoMO and Instagram Use spans from 10, indicating a low level, to 50, representing a high level. As a result, participants showed a low to moderate level of Instagram Use ($M = 25.2$, $SD = 7.3$), and a slightly higher level of FoMO ($M = 26.7$, $SD = 7.3$). For the level of self-compassion, participants could score between 12 and 60, with higher scores representing. Therefore, on average, a moderate level of Self-compassion was identified ($M = 37.9$, $SD = 6.9$). The descriptive statistics were used as a basis for further analysis purposes.

Table 1

Mean and Standard Deviation for SMUIS, FoMOs, SCF-SF

| Variable | <i>M</i> | <i>SD</i> |
|---------------------|----------|-----------|
| Instagram Use | 25.2 | 7.3 |
| Fear of Missing Out | 26.7 | 7.3 |
| Self-compassion | 37.9 | 6.9 |

Note. N= 71

Linear Regression Analysis

A linear regression analysis was performed to assess the relationship between Instagram Use (IV) and FoMO (DV) (Table 2). The output suggested that a statistically significant positive relationship between the two variables was present ($\beta = 0.37$, $t(69) = 3.30$, $p < .05$). The findings indicate a positive association between the use of Instagram and an increased level of FoMO, meaning that greater reliance on Instagram is related to higher levels of FoMO. Thus, the first

hypothesis can be accepted: 'High Instagram Use is associated with a higher level of Fear of Missing Out'.

Table 2

Regression Analysis of the Relationship between Social Media Use (IV) and Fear of Missing Out (DV)

| Effect | Estimate | SE | 95% CI | | p |
|---------------|----------|------|--------|------|------|
| | | | LL | UL | |
| Intercept | 17.4 | 2.93 | 11.52 | 23.2 | .00 |
| Instagram Use | 0.37 | 0.11 | 0.15 | 0.59 | .002 |

Note. CI = confidence interval; LL = lower limit; UL = upper limit

Moderation Analyses

A multiple linear regression analysis was conducted to assess the interaction effect of the variables self-compassion on Instagram Use (IV) and FoMO (DV). To assess the effect of the moderation variable, specific conditions needed to be met. It must be ensured that there exists a significant relationship between Instagram Use and FoMO, which was indeed the case ($\beta = 0.37$, $t(69) = 3.30$, $p < .05$). Secondly, the moderator variable must be related to FoMO which has been revealed to be the case ($\beta = -0.37$, $t(69) = -3.163$, $p < .05$). Next to that, there has to be an interaction effect on the dependent variable FoMO. The results suggested that the model was not significant as the regression coefficient estimate of the interaction term was ($\beta = -0.01$, $t(67) = -0.36$, $p > .05$). Thus, the second hypothesis needed to be rejected (Table 3).

Table 3

Multiple Linear Regression Analysis of Social Media Use (IV), Fear of Missing Out (DV), and Self-compassion (Moderator Variable)

| Effect | Estimate | SE | 95% CI | | p |
|-----------|----------|-------|--------|-------|-----|
| | | | LL | UL | |
| Intercept | 25.54 | 15.74 | -5.88 | 56.96 | .11 |

| | | | | | |
|-------------------|-------|------|-------|------|------|
| Instagram Use | 0.54 | 0.58 | -0.61 | 1.7 | .36 |
| Self-compassion | -0.20 | 0.40 | -0.98 | 0.59 | .62 |
| Instagram Use | -0.01 | 0.01 | -0.03 | 0.02 | .718 |
| *Self-compassion* | | | | | |

Note. CI = confidence interval; *LL* = lower limit; *UL* = upper limit

Discussion

The purpose of this study was to determine the relationship between Instagram Use and FoMO. In addition, the influence of a moderation effect as a potential third factor, namely self-compassion was tested. A cross-sectional study design was used to investigate these relationships, which revealed two main findings and interesting results about the descriptive statistics.

Implications

By examining the sample, and analysing the measurement scales for Instagram Use, FoMO, and Self-compassion, noteworthy findings emerged. First, the sample consisted of 71 participants in total, an overall higher number of women (64.79%, $n=46$), compared to men (35.21%, $n= 25$) was found, and 88.3% of the participants were German or Dutch. The mean age of 21.72 was rather low for representing the target group of young adults aged between 18 to 29 ($SD= 1.77$). In this regard, interestingly Phillips & Wisniewski (2021) have conducted a similar study. In their study, the self-compassion level differed significantly between high and moderate SM users, meaning individuals using SM regularly showed lower levels of self-compassion. Although the level of self-compassion was similarly measured in this study with the SCF-SF, Phillips & Wisniewski (2021) conducted a more comprehensive measurement of the variable SM by evaluating factors such as time spent on social media, frequency of SM, and emotional responses towards SM. Hence, the measurement method might explain the distinctive results of the current study, as only moderate levels could be identified in the three variables Instagram Use ($M = 25.2$, $SD = 7.3$), FoMO ($M = 26.7$, $SD = 7.3$), and Self-compassion ($M = 37.9$, $SD = 6.9$). Additionally, Phillips & Wisniewski (2021) have included a wider age range of participants aged 19 to 71, which is significantly different compared to this study, as only Instagram users aged 18 to 29 were included. Furthermore, a pre-post measurement study conducted by Căndea et al.

(2018) has revealed a significant impact of one's self-compassion on individuals' mental well-being. In this study, a two-week self-compassion pre-post online training was executed to identify the influence of individuals' self-compassion levels. Hence, factors such as the measurement methods, a broader age range, and the study design have been differently addressed in this research compared to other studies. Nevertheless, two main findings can be drawn based on the results of this research study.

The first hypothesis was accepted after conducting a linear regression analysis. A significant effect was found between the independent variable Instagram Use and the dependent variable FoMO. This means the two variables are positively correlated, as more Instagram Use indicates higher levels of FoMO. These findings are in line with other researchers' results. According to Roberts & David (2020), and Tandon et al. (2022), evidence supports the existence of a positive association between SM use and FoMO. In another study conducted by Keyte et al. (2021), a relation of one's intensity of Instagram Use indeed impacts an individual's psychological well-being. Therefore, based on the findings of this study, it can be concluded that a person's reliance on Instagram Use induces feelings of FoMO. Thus, the finding yields practical implications for the platform Instagram, as a balanced SM usage can be promoted by encouraging self-reflection and personal boundaries, for instance. Next to that, given the established relationship between Instagram Use and FoMO, a foundation for investigating in a potential third influential factor is provided.

Regarding the second hypothesis, it was expected that the third-factor self-compassion weakens the association between Instagram Use and FoMO and has a moderating effect on this relationship. This study's results indicated no significant interaction effect, meaning that the hypothesis needs to be rejected. This is not in line with previous studies, which identified self-compassion as an important factor that protects SM users from experiencing mental health symptoms (Phillips & Wisniewski, 2021). Additionally, in the study by Keyte et al. (2021), a mediating effect was found between Instagram Use, self-compassion, and one's well-being. Hence, differences between the studies must be detected to explain the underlying reason for these findings. In line with other studies, questionnaires were used to assess the moderation effect on individuals' well-being (Keyte et al., 2021; Phillips & Wisniewski, 2021). However, other studies have often referred to anxiety or depression as one's negative mental health outcome, while this study specifically addressed FoMO (Keyte et al., 2021; Phillips & Wisniewski, 2021; Vidal et al., 2020). Since FoMO can be seen as a specific state a person is

experiencing at a specific time of the day (Maxwell et al., 2022), it might be challenging to address this mental health state solely with questionnaires accurately (Strijker et al., 2020). In other words, FoMO can be experienced at a specific point in time, such as after using Instagram, and if the questionnaire is filled out randomly during the day, the influence of users' self-compassion level might not be as accurately assessable (Cândeia et al., 2018). Thus, the choice of the research design might explain the distinctive results of this study compared to others. Nevertheless, various strengths and limitations need to be addressed, to evaluate the results.

Strengths and Limitations

The present study showed several strengths that are important to consider. Firstly, the chosen measurement methods for the variables Instagram Use, FoMO, and self-compassion show good validity and reliability. The scales are widely used, and all indicate good internal consistency (Przybylski et al., 2013; Raes et al. 2011; Sigerson & Cheng, 2018). Next to that, the sample size of 71 participants was considered sufficient, as the statistical power analysis identified 34 necessary participants for achieving significant results. Furthermore, while most researchers have focused on mental health outcomes such as depression and anxiety in relation to either Instagram Use or SM use (Keyte et al., 2021; Phillips & Wisniewski, 2021; Vidal et al., 2020), this research specifically assesses the variable FoMO. Considering the time the study is conducted, and the various functions offered by the application Instagram, people seem to be most at risk for developing FoMO symptoms (Foroughi et al., 2022; Roberts & David, 2020). Thus, the findings are important to consider by evaluating the influence of SM on young individual's mental health nowadays. In addition, some limitations need to be taken into account.

By analysing the sample and evaluating the three questionnaires, important limitations were noticed. Firstly, a notable disparity in participation of the number of women (64.79%, $n = 46$) compared to men (35.21%, $n = 25$) was observed. Although the imbalance of more women participating might have influenced the analysis, it was not considered in the study (Fioravanti et al., 2020). Another limitation that was not taken into account by analysing the data was the consideration of the time it took to complete the questionnaire. Some participants had unusually quick response times that are significantly representative of poor data quality. In total, 26 participants took less than 10 minutes to complete the questionnaire fully. The completion of six questionnaires within a relatively short timeframe indicates a noteworthy limitation that could have been prevented by incorporating an attention question within the survey. Thereby,

participants' careful engagement would have been ensured, and insignificant responses would have been excluded in advance. Next to that, it is worth noting that the mean age of 21.72 is rather low for representing the target population which encompasses individuals aged 18 to 29. The mentioned factors were not accounted for in the analysis, which shows limitations in the representation of the sample population, along with other potential shortcomings.

The limitations extend beyond the representation of the sample and encompass the study design that was used. A cross-sectional study design measures the correlation of variables at a single point in time. In this study, a pre-post measurement would have given more accurate indications about the second hypothesis, as comparing individuals' self-compassion levels at two different points in time might yield different results (Wan, 2021). Furthermore, a noticeable limitation is the research method that was used. Quantitative research simplifies complex phenomena into accessible variables to draw justifiable conclusions from the data (Strijker et al., 2020). This is visible in the research since, within the three variables, significant deviations between the participant's scores were observed. Upon measuring the variable self-compassion, a relatively high standard deviation of 6.9 was identified, which potentially be due to the diverse interpretations of the items by participants. Similarly, for Instagram Use and FoMO a standard deviation of 7.3 was observed, indicating that participants might have subjectively evaluated the questionnaire. This represents a certain lack of precision in the measurement tools, as well as the research method (Strijker et al., 2020). Thus, it is beneficial for future researchers to consider multiple different aspects before conducting a study.

Implications for further research

Future research could consider conducting a qualitative research approach rather than using a quantitative study which might effectively explore the concept of the three variables differently. In other words, researchers could consider conducting interviews to facilitate more specific information regarding the subjective meaning of the three variables. Specifically, by delving deeper into how individuals define self-compassion and how participants practice self-compassionate behaviour daily, it becomes possible to examine how this factor might influence the reliance of users on Instagram (Cândeia et al., 2018; Strijker et al., 2020). Hence, a qualitative study design is needed to operationalize the variable self-compassion, as participants' subjective meaning would be clearer. Nevertheless, not just the variable self-compassion could be measured more specifically with a qualitative study, but the variable Instagram Use would also have been more accurately measured (Strijker et al., 2020). Some individuals might use

different functions within the application or post pictures more regularly on their account, which might have had a different influence on users' FoMO level. This could be identified by directly asking participants and conducting interviews. Furthermore, a pre-post measurement can be used, to show the influence of a self-compassion attitude more accurately (Cândeia et al., 2018). This means comparing one's self-compassion level before and after executing a self-compassionate behaviour would have given more accurate results (Cândeia et al., 2018). Thereby, possible biases can be avoided that might arise by simply using a ten-item questionnaire once to assess the variables (Strijker et al., 2020). Additionally, an experience sampling method would indicate more accurate results of a person's feelings of state FoMO, as with this, individual's emotions would be measured right after using Instagram (Wan, 2021). Consequently, a qualitative study might effectively explore specific aspects of the third variable self-compassion, as well as pre-post measurements, and the experience sampling method might enable a more comprehensive understanding of the significance in relation to mental health issues, such as FoMO (Strijker et al., 2020; Wan, 2021). However, since this study did not reveal any significant effects of the variable self-compassion, it is important to even consider different third factors that might influence the relationship.

The conducted research positively contributed to the understanding of the impact of Instagram Use on one's FoMO level but did not reveal a significant effect of the variable self-compassion. More research is necessary to investigate multiple third factors by specifically focusing on the moderation role, as this would indicate the strength of the relationship between Instagram Use and FoMO. Thus, the presence of a third variable might decrease the intensity of an individual's FoMO symptoms and in turn, lessen the reliance on Instagram Use (Maxwell et al., 2022; Roberts & David, 2020; Tandon et al., 2022). Additionally, broadening the variety of the sample population by considering the gender, and broadening the age range, potentially yields different results. The usage of SM does not only increase in young adults (Auxier & Anderson, 2021), which raises the importance of reconsidering the target group. However, the primary focus should be placed on additional factors that decrease the relationship between SM and FoMO. Since the ever-increasing usage of especially Instagram (Faelens et al., 2021), it is crucial to identify not just one factor that influences user's reliance on SM websites.

Concludingly, the study results can be seen as a preliminary exploration of the relationship between Instagram Use and FoMO. Nevertheless, future researchers should carefully select the study design, measurement method, and sample by considering the mentioned limitations.

Conclusion

The ever-increasing use of SM websites cannot be denied, which generates mental health consequences, that specifically Instagram users between the age of 18 to 29 seem to be most at risk. Thus, this study focused on examining the relationship between Instagram Use and FoMO, and the moderating role of individuals' self-compassionate level. The findings confirmed that users' reliance on Instagram is related to their FoMO level. This finding reveals practical implications for the SM website Instagram, as features that promote balanced usage could be implemented. However, no significant effect was found with regard to the moderator variable self-compassion. Nevertheless, the study results serve as a basis for exploring additional factors that influence the relationship between SM use and users' well-being. Thus, future researchers should consider the sample population and incorporate a qualitative study design that might provide deeper insights into users' subjective experiences of self-compassion.

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Appendix A

Informed consent

Dear participant,

You are invited to participate in an online survey “The Relationship between Social Media Use and Mental Health”. From this, you have the right to withdraw at any time without any negative consequences or providing any reasons. For that, please note that there are no right or wrong answers so it is about indicating your own subjective view. You will be asked to provide demographic information. The research procedure consists of a questionnaire which will take approximately 15 minutes. The results will be saved for later investigation purposes. The data we collect will be handled confidentially. The analysis of the data will be anonymous and only for purposes of the research. After completing the project, the data will be deleted. Thus there are no expected risks within the participation in our study. You need to be at least 18 years old to participate.

If you have any further questions, feel free to contact us:

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Appendix B

R-script

```
#### Set working directory ####
setwd("/Users/Maliiii/Downloads")

##load packages##
library(readxl)
library(foreign)
library(lavaan)
library(lavaanPlot)
library(dplyr)
library(haven)
library(ggpubr)
library(knitr)
library(semPlot)
library(MVN)
library(tidyr)
library(tidyverse)
library(WriteXLS)
library(ltm)
library(outliers)
library(EnvStats)
library(broom)

#### Import data ####
Bachelor_survey <- read_xlsx("Bachelor_survey_02.05.2023.xlsx")
View(Bachelor_survey)
summary(Bachelor_survey)

####clean the data####

## Delete rows where the value in "my_column" is "False"##
TEST_bachelor <- Bachelor_survey[Bachelor_survey$Finished != "False",]
```

```

### Remove columns ###

# Remove multiple columns from the data set #
TEST_bachelor <- TEST_bachelor[, !(names(TEST_bachelor) %in% c("Status", "IPAddress",
"Progress", "RecordedDate", "Responseid", "RecipientLastName", "RecipientFirstName",
"RecipientEmail", "ExternalReference", "LocationLatitude", "LocationLongitude",
"DistributionChannel", "UserLanguage"))]

###Remove other scales###

# SONTUS scale #
columns_to_remove_SONTUS <- grep("^SONTUS", names(TEST_bachelor), value = TRUE)
TEST_bachelor <- TEST_bachelor[, !(names(TEST_bachelor) %in%
columns_to_remove_SONTUS)]

# Q14 #
columns_to_remove_Q14 <- grep("^Q14", names(TEST_bachelor), value = TRUE)
TEST_bachelor <- TEST_bachelor[, !(names(TEST_bachelor) %in%
columns_to_remove_Q14)]

# PHQ-9 #
columns_to_remove_PHQ <- grep("^PHQ", names(TEST_bachelor), value = TRUE)
TEST_bachelor <- TEST_bachelor[, !(names(TEST_bachelor) %in%
columns_to_remove_PHQ)]

## filter data to include only ages between 18 and 29 ##
data_cleaned <- TEST_bachelor[TEST_bachelor$Age >= 18 & TEST_bachelor$Age <= 29, ]

####delete non-numeric items SMUIS_8####
data_cleaned$SMUIS_8 <- as.numeric(gsub("[^0-9.-]", "", data_cleaned$SMUIS_8))

##reverse item SMUIS_8##
data_cleaned$SMUIS_8 <- 6 - data_cleaned$SMUIS_8

```

```
####delete non-numeric items SCF-SF####
```

```
data_cleaned$`Self-compassion_1` <- as.numeric(gsub("[^0-9.-]", "",
data_cleaned$`Self-compassion_1`))
```

```
##reverse item Self-compassion_1##
```

```
data_cleaned$`Self-compassion_1` <- 6 - data_cleaned$`Self-compassion_1`
```

```
####delete non-numeric items SCF-SF####
```

```
data_cleaned$`Self-compassion_4` <- as.numeric(gsub("[^0-9.-]", "",
data_cleaned$`Self-compassion_4`))
```

```
##reverse item Self-compassion_4##
```

```
data_cleaned$`Self-compassion_4` <- 6 - data_cleaned$`Self-compassion_4`
```

```
####delete non-numeric items SCF-SF####
```

```
data_cleaned$`Self-compassion_8` <- as.numeric(gsub("[^0-9.-]", "",
data_cleaned$`Self-compassion_8`))
```

```
##reverse item Self-compassion_8##
```

```
data_cleaned$`Self-compassion_8` <- 6 - data_cleaned$`Self-compassion_8`
```

```
####delete non-numeric items SCF-SF####
```

```
data_cleaned$`Self-compassion_9` <- as.numeric(gsub("[^0-9.-]", "",
data_cleaned$`Self-compassion_9`))
```

```
##reverse item Self-compassion_9##
```

```
data_cleaned$`Self-compassion_9` <- 6 - data_cleaned$`Self-compassion_9`
```

```
####delete non-numeric items SCF-SF####
```

```
data_cleaned$`Self-compassion_11` <- as.numeric(gsub("[^0-9.-]", "",
data_cleaned$`Self-compassion_11`))
```

```
##reverse item Self-compassion_11##
```

```
data_cleaned$`Self-compassion_11` <- 6 - data_cleaned$`Self-compassion_11`
```

```

####delete non-numeric items SCF-SF####
data_cleaned$`Self-compassion_12` <- as.numeric(gsub("[^0-9.-]", "",
data_cleaned$`Self-compassion_12`))

##reverse item Self-compassion_12##
data_cleaned$`Self-compassion_12` <- 6 - data_cleaned$`Self-compassion_12`

###summarize values###

##SCF-SF##

#delete all non-numeric responses#
data_cleaned$`Self-compassion_2` <- as.numeric(gsub("[^0-9.-]", "",
data_cleaned$`Self-compassion_2`))
data_cleaned$`Self-compassion_3` <- as.numeric(gsub("[^0-9.-]", "",
data_cleaned$`Self-compassion_3`))
data_cleaned$`Self-compassion_5` <- as.numeric(gsub("[^0-9.-]", "",
data_cleaned$`Self-compassion_5`))
data_cleaned$`Self-compassion_6` <- as.numeric(gsub("[^0-9.-]", "",
data_cleaned$`Self-compassion_6`))
data_cleaned$`Self-compassion_7` <- as.numeric(gsub("[^0-9.-]", "",
data_cleaned$`Self-compassion_7`))
data_cleaned$`Self-compassion_10` <- as.numeric(gsub("[^0-9.-]", "",
data_cleaned$`Self-compassion_10`))

# Create a new variable called 'SCF_total' that is the sum of all 12 items #
data_cleaned$SCF_total <- rowSums(data_cleaned[, c("Self-compassion_1",
"Self-compassion_2", "Self-compassion_3", "Self-compassion_4", "Self-compassion_5",
"Self-compassion_6", "Self-compassion_7", "Self-compassion_8", "Self-compassion_9",
"Self-compassion_10", "Self-compassion_11", "Self-compassion_12")])

# View the new variable
data_cleaned$SCF_total

###SMUIS###

```

```

#delete all non-numeric responses#
data_cleaned$`SMUIS_1` <- as.numeric(gsub("[^0-9.-]", "", data_cleaned$`SMUIS_1`))
data_cleaned$`SMUIS_2` <- as.numeric(gsub("[^0-9.-]", "", data_cleaned$`SMUIS_2`))
data_cleaned$`SMUIS_3` <- as.numeric(gsub("[^0-9.-]", "", data_cleaned$`SMUIS_3`))
data_cleaned$`SMUIS_4` <- as.numeric(gsub("[^0-9.-]", "", data_cleaned$`SMUIS_4`))
data_cleaned$`SMUIS_5` <- as.numeric(gsub("[^0-9.-]", "", data_cleaned$`SMUIS_5`))
data_cleaned$`SMUIS_6` <- as.numeric(gsub("[^0-9.-]", "", data_cleaned$`SMUIS_6`))
data_cleaned$`SMUIS_7` <- as.numeric(gsub("[^0-9.-]", "", data_cleaned$`SMUIS_7`))
data_cleaned$`SMUIS_9` <- as.numeric(gsub("[^0-9.-]", "", data_cleaned$`SMUIS_9`))
data_cleaned$`SMUIS_10` <- as.numeric(gsub("[^0-9.-]", "", data_cleaned$`SMUIS_10`))

#create a new variable called SMUIS_total that is the sum of all 10 items#
data_cleaned$SMUIS_total <- rowSums(data_cleaned[, c("SMUIS_1", "SMUIS_2",
"SMUIS_3", "SMUIS_4", "SMUIS_5", "SMUIS_6", "SMUIS_7", "SMUIS_8", "SMUIS_9",
"SMUIS_10")])

# View the new variable
data_cleaned$SMUIS_total

###FoMO##

#delete all non-numeric responses#
data_cleaned$`Fear of Missing Out _1` <- as.numeric(gsub("[^0-9.-]", "", data_cleaned$`Fear of
Missing Out _1`))
data_cleaned$`Fear of Missing Out _2` <- as.numeric(gsub("[^0-9.-]", "", data_cleaned$`Fear of
Missing Out _2`))
data_cleaned$`Fear of Missing Out _3` <- as.numeric(gsub("[^0-9.-]", "", data_cleaned$`Fear of
Missing Out _3`))
data_cleaned$`Fear of Missing Out _4` <- as.numeric(gsub("[^0-9.-]", "", data_cleaned$`Fear of
Missing Out _4`))
data_cleaned$`Fear of Missing Out _5` <- as.numeric(gsub("[^0-9.-]", "", data_cleaned$`Fear of
Missing Out _5`))
data_cleaned$`Fear of Missing Out _6` <- as.numeric(gsub("[^0-9.-]", "", data_cleaned$`Fear of

```

```

Missing Out _6`))
data_cleaned$`Fear of Missing Out _7` <- as.numeric(gsub("[^0-9.-]", "", data_cleaned$`Fear of
Missing Out _7`))
data_cleaned$`Fear of Missing Out _8` <- as.numeric(gsub("[^0-9.-]", "", data_cleaned$`Fear of
Missing Out _8`))
data_cleaned$`Fear of Missing Out _9` <- as.numeric(gsub("[^0-9.-]", "", data_cleaned$`Fear of
Missing Out _9`))
data_cleaned$`Fear of Missing Out _10` <- as.numeric(gsub("[^0-9.-]", "", data_cleaned$`Fear
of Missing Out _10`))

#create a new variable called FoMO_total that is the sum of all 10 items #
data_cleaned$FoMO_total <- rowSums(data_cleaned[, c("Fear of Missing Out _1", "Fear of
Missing Out _2", "Fear of Missing Out _3", "Fear of Missing Out _4", "Fear of Missing Out _5",
"Fear of Missing Out _6", "Fear of Missing Out _7", "Fear of Missing Out _8", "Fear of Missing
Out _9", "Fear of Missing Out _10")])

# View the new variable
data_cleaned$FoMO_total

####descriptive statistics####
data_cleaned %>% summary()
#SCF-sd#
data_cleaned$SCF_total %>% sd
#SMUIS-sd#
data_cleaned$SMUIS_total %>% sd
#FoMO-sd#
data_cleaned$FoMO_total %>% sd

####regression analysis (test for assumptions)####
#making model of IV and DV (interchange for yours)
model <- data_cleaned %>%
  lm(SMUIS_total ~ FoMO_total, data = .)

```

```
#add resid and pred
data_cleaned <- data_cleaned %>%
  add_residuals(model)
data_cleaned <- data_cleaned %>%
  add_predictions(model)

## Normality ##
data_cleaned %>%
  add_residuals(model) %>%
  ggplot(aes(x = resid)) +
  geom_histogram()
# Perform Shapiro-Wilk normality test on the residuals #
shapiro.test(residuals)

## Independence ##
library(ggplot2)
install.packages("lmtest")
library(lmtest)

model1 <- lm(SMUIS_total ~ FoMO_total, data = data_cleaned)
model2 <- lm(SCF_total ~ FoMO_total, data = data_cleaned)
model3 <- lm(FoMO_total ~ SMUIS_total, data = data_cleaned)

dwtest(model1)
dwtest(model2)
dwtest(model3)

## Linearity ##
#residual vs fitted plot for linearity #
# Fit the linear regression model #
model <- lm(SMUIS_total ~ FoMO_total, data = data_cleaned)
model2 <- lm(SCF_total ~ FoMO_total, data = data_cleaned)
```



```
model3 <- lm(FoMO_total ~ SMUIS_total, data = data_cleaned)
# Create the residuals vs. fitted plot #
plot(model$fitted.values, model$residuals, xlab = "Fitted Values", ylab = "Residuals", main =
"Residuals vs. Fitted Plot")
abline(h = 0, col = "red", lwd = 2)
plot(model$fitted.values, model2$residuals, xlab = "Fitted Values", ylab = "Residuals", main =
"Residuals vs. Fitted Plot")
abline(h = 0, col = "red", lwd = 2)
plot(model$fitted.values, model3$residuals, xlab = "Fitted Values", ylab = "Residuals", main =
"Residuals vs. Fitted Plot")
abline(h = 0, col = "red", lwd = 2)

## Equal variance ##
# Perform Fligner-Killeen test
fligner_test1 <- fligner.test(SMUIS_total ~ FoMO_total, data = data_cleaned)
fligner_test2 <- fligner.test(SCF_total ~ FoMO_total, data = data_cleaned)
fligner_test3 <- fligner.test(FoMO_total ~ SMUIS_total, data = data_cleaned)
# Extract the p-value from the test result
p_value1 <- fligner_test1$p.value
p_value2 <- fligner_test2$p.value
p_value3 <- fligner_test3$p.value

## Multicollinearity ##
# Install and load the "car" package
install.packages("car")
library(car)

# Fit your regression model
model4 <- lm(SMUIS_total ~ SMUIS_1 + SMUIS_2 + SMUIS_3 + SMUIS_4 + SMUIS_5 +
SMUIS_6 + SMUIS_7 + SMUIS_8 + SMUIS_9 + SMUIS_10, data = data_cleaned)

# Calculate VIF values
vif_values <- vif(model4)
```

```
# Print the VIF values
print(vif_values)

#calculate Pearson's correlation coefficient#
correlation_coefficient <- cor(data_cleaned$FoMO_total, data_cleaned$SMUIS_total, method =
"pearson")
# Print the result of pearsons correlation coefficient
print(correlation_coefficient)

#### Fit the linear regression model ####
model3 <- lm(FoMO_total ~ SMUIS_total, data = data_cleaned)
## Print the summary of the regression model ##
summary(model3)
## Calculate the confidence intervals ##
confint(model3)

# fit a linear regression analysis with SCF and FoMO #
model4 <- lm(FoMO_total ~ SCF_total, data = data_cleaned)
## Print the summary of the regression model ##
summary(model4)
## calculate the confidence interval ##
confint(model4)

# Fit the linear multiple regression model with interaction effect #
model11 <- lm(FoMO_total ~ SMUIS_total + SCF_total + SMUIS_total:SCF_total, data =
data_cleaned)
# Print the summary of the linear multiple regression model #
summary(model11)
# Calculate the confidence intervals for all coefficients #
confint(model11)
```