

Look At What They're Doing! Does the Fear of Missing Out (FOMO) mediate the
Relationship Between Self-Esteem and Psychological Distress?

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BPsych (Hons)

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Declarations Statement of Originality

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. I give consent to the final version of my thesis being made available worldwide when deposited in the University's Digital Repository, subject to the provisions of the Copyright Act 1968.

Acknowledgement of Collaboration

I hereby certify that the work embodied in this thesis has been done in collaboration with other researchers. I have included as part of this thesis a statement clearly outlining the extent of collaboration, with whom and under what auspices.

I contributed to the research question, statistical analysis and the interpretation of results. Dr Nicholas Harris was responsible for the development of the survey, submitting the initial application to the Ethics Committee, data collection, reimbursements of participants, and data screening.

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Lastly, I would like to express my deepest thanks to my family, friends and partner who have all supported and encouraged me over the past two years. I am forever grateful to be surrounded by such wonderful and wholesome people.

Statement of Authorship

I hereby certify that the work embodied in this thesis contains a manuscript of which I

am a joint author. I have included as part of the thesis a written statement, endorsed by my supervisor, attesting to my contribution to the joint work.

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Formatting Style Used in This Thesis

This thesis is formatted according to the *Publication Manual of the American Psychological Association, seventh edition*. The manuscript was formatted for submission to the *Journal of Social and Clinical Psychology* in line with the submission guidelines and instructions for authors which are contained in the Appendix (please see Appendix A).

Look At What They're Doing! Does the Fear of Missing Out (FOMO) Mediate the
Relationship Between Self-Esteem and Psychological Distress?

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Conflicts of Interest

All authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript.

Ethics Approval

Approval was initially granted by the Ethics Committee of Australian College of Applied Psychology (ACAP), NSW, Australia (Approval number: 353310517). Secondary approval was granted by the Ethics Committee of the University of Newcastle, NSW, Australia (Approval number: H-2020-0390). Please see Appendix B.

Consent to Participate

Informed consent was obtained from all individual participants included in the study.

Consent to Publish

The authors affirm that human research participants provided informed consent for their de-identified data to be published.

Author Contributions

SA analysed the data and wrote the thesis. NH developed the study and collected the data. RW revised the manuscript and both SA and RW interpreted the results.

Abstract

Introduction

The Fear of Missing Out (FOMO) contributes to a variety of mental health conditions and interpersonal difficulties. However, the mechanisms for these negative effects are unclear. The current study examines two mediation models exploring the relationships between FOMO, self-esteem, and psychological distress (depression, anxiety and stress).

Methods

This study was a secondary data analysis of data from 560 individuals (N=129 males, 427 females, 4 other; mean age=31.1years) who had completed an online, self-report questionnaire. Data examined included responses from the Fear of Missing Out Scale, Rosenberg's Self Esteem Scale, and the DASS-21.

Results

FOMO was negatively correlated with self-esteem and positively correlated with distress. Self-esteem was negatively correlated with distress. Mediation analyses revealed that while FOMO did not mediate the relationship between self-esteem and distress, self-esteem was a weak mediator between FOMO and distress.

Discussion

Whilst the current study found some support for the theory that individuals with low self-esteem are likely to experience FOMO and distress, there may be other factors and mediators to consider when exploring the mechanisms of self-esteem's relationship with distress (i.e., personality variables and attachment styles). This is an important area of research that has implications for both mental health services and the community.

Look At What They're Doing! Does the Fear of Missing Out (FOMO) Mediate the Relationship Between Self-Esteem and Psychological Distress?

Have you ever checked your text messages or social media accounts on your phone to see if your friends were up to something fun? Have you ever said yes to going out when you were tired? Have you ever gone to a restaurant and wanted to try all of the best foods? If your answer is yes, then you have likely experienced the Fear of Missing Out (FOMO). FOMO is a term used to describe the feeling and perception that others are having more fun and/or they are partaking in more rewarding experiences than you are (Riordan et al., 2018). For example, FOMO can be likened to that uneasy and consuming feeling that you are not part of what your friends are doing and that they are in possession of something that is superior to you (Abel et al., 2016). This feeling can be experienced both when an individual is on their own and/or when they are in a group. Thus, FOMO is identified as the psychological need to stay connected with what other people are doing and therefore, it can be understood through self-determination theory (SDT). SDT posits that FOMO arises from deficits in psychological need satisfaction. For example, deficits in need may lead to individuals reaching out and connecting to others, which could therefore lead to FOMO (Przybylski et al., 2013).

FOMO has also been likened to the expression 'keeping up with the Joneses', which describes the act of comparing yourself to others and it is driven by the desire to be constantly informed about what other people are doing. Thus, FOMO could also be thought of as an upward social comparison with your social connections and the broader society. This concept also relates to social psychological theories which highlight that humans have a desire for relationships with others as well as a need to belong, and as such they are consistently engaging in comparisons with others both inside and outside of their social groups (Baumeister, 2012; James et al., 2017).

Humans are social animals, and as such, they have a strong desire to belong to social groups. We are naturally driven by motivations to stay connected with friends and family and are curious about what is going on in the minds and lives of others (Lieberman, 2013). In contemporary society, social groups exist in both physical (face-to-face) and online platforms. Social connectedness boosts self-esteem (Howell et al., 2019) and health outcomes. However, individuals who do not feel socially connected tend to exhibit poorer mental health (e.g., depression) and physical health (Saeri et al., 2017).

FOMO and Social Media

One way of maintaining healthy relationships with others is through social contact and interaction; something facilitated by social media platforms and the widespread availability of mobile phones (James et al., 2017). Social media platforms (e.g., Facebook, Instagram, Twitter etc.) provide many ways for people to stay connected, by providing individuals with easy access to current information as well as various ways to connect with people remotely (Przybylski et al., 2013).

Given that FOMO is associated with the need to stay socially connected, previous research has predominantly focused on the link between FOMO and smartphone use including, social media (Dempsey et al., 2019; Metin-Orta, 2020; Roberts & David, 2019). The mobile phone is easily accessible due to its portable nature, and social media is also easily accessible due to mobile data coverage, and it plays a large role in many people's lives. That is, most individuals (particularly young people aged between 8 and 17 years) use social media accounts regularly (Australian Government, 2018; Burns, 2017) which allows them to effortlessly view what other people are doing and, consequently, what they may be missing out on.

It has been argued that social media accounts are mostly a positive force as they provide infinite opportunities for social interaction and connectedness with others (Przybylski et al., 2013). Social networking sites are used for a range of social factors including (but not limited to); communicating with current friends, forming new friendships and relationships, obtaining information, exchanging ideas, entertainment and having fun (uploading photos, playing games, making videos etc.) (Hamutoglu et al., 2020). While social media use has many benefits including increased belongingness (to online friends) (James et al., 2017), decreased loneliness (Pittman & Reich, 2016) and an increase in self-esteem (Valkenburg et al., 2006), it has also been associated with a range of negative consequences, such as anxiety, depression (Dalbudak & Evren, 2014), and lower levels of self-esteem (Buglass et al., 2017). Positive feedback on social networking sites (i.e., likes/comments on photos) can increase self-esteem (Valkenburg et al., 2006) but individuals may visit other peoples' online profiles where they compare and judge themselves negatively, potentially leading to decreased self-esteem (Jan, et al., 2017).

In addition, there are a range of risks that may be associated with social media sites including cyber bullying, hacking, addiction, risky behaviours, time wastage, distorted body image, over-sharing of personal information (Akram & Kumar, 2017) and exposure to negative content (Shensa, et al., 2020). These risks can also consequently lead to higher levels of psychological distress and problematic sleeping patterns/ increased fatigue (associated with use) (Milyavskaya, et al., 2018). For example, environmental stressors (i.e., bullying, hacking etc.) can be a risk factor for mental health conditions such as depression (Carr & McNulty, 2016) as individuals can be neglecting 'real life' responsibilities (i.e., household chores) due to social media use (Shensa, et al., 2020). Furthermore, people may also miss out on various rewarding experiences due to problematic social media use (Przybylski et al., 2013) and they may also experience FOMO (Hamutoglu et al., 2020).

It is important to acknowledge the positive and negative effects of social media use, as they too can have a direct impact on an individual, much like FOMO. For example, smartphones (and social media accounts) provide easy opportunities to connect with others, which can consequently lead to an increased risk of experiencing FOMO.

Previous research has also shown that there is a significant relationship between social media use and age. That is, younger adults are more likely to use social media than older adults (Bell, et.al., 2013; Duggan & Brenner, 2013). Whilst the percentage of older adults using social media has increased substantially in recent years, older adults are still less likely to use social media when compared to younger adults.

FOMO as a Broader Construct

As discussed, previous research has shown that social media use plays a role in FOMO. For example, a study completed by Roberts and David (2019), found that FOMO was positively associated with social media intensity, and they concluded that FOMO encourages the use of social media as a way of staying connected.

However, FOMO is a much broader construct and often occurs without social media exposure. That is, FOMO can be experienced through direct social contact and interactions with others (Milyavskaya, et al., 2018). Direct social contact can also lead to social comparisons which can additionally lead to FOMO. For example, individuals can compare themselves to others whom they believe are better off than they are, thus leading to negative feelings (including FOMO) and low self-esteem (Stets & Burke, 2014). Comparisons can be made across a wide range of areas, including (but not limited to) activities of enjoyment, employment/financial status, relationships, affiliation, materialistic possessions and attractiveness/physical characteristics (Locke, 2014).

Furthermore, research has shown that FOMO can also be related to individual factors such as anxiety, depression and boredom. Holte and Ferraro (2020) found that individuals who are bored (under stimulated) are more inclined to think they are missing out on a rewarding experience, thus leading to FOMO, as compared to individuals who are cognitively stimulated and entertained. The same study also found that boredom affects FOMO through mediating the relationship between anxiety/depression and FOMO. Individuals with anxiety/depression tend to experience lower life-satisfaction, thus leading to the fear that they are missing out on opportunities that could improve their overall life satisfaction (Holte & Ferraro, 2020).

FOMO can also have an influence on buying/purchasing behaviour. Consumers make purchases for many reasons including (but not limited to); enhanced social status, peer's attitudes and their own intrinsic personal motivations. All of these are emotional responses that can be influenced by FOMO (Good & Hyman, 2020). Thus, FOMO can significantly influence people in various situations and across a wide range of contexts.

FOMO and Mental Health

Whilst FOMO is not a mental health disorder itself, there does appear to be links between FOMO, psychological distress (e.g., depression and anxiety) and overall self-esteem (Barry & Wong, 2020; Leung, et al., 2021; Stets & Burke, 2014). Higher levels of FOMO are often associated with negative emotional responses, such as feelings of envy and/or jealousy, while on social media platforms (Harmon, 2020). This could consequently cause feelings of anxiety, stress and depression due to the individual feeling that they are missing out on events that they see as important. A growing number of researchers have investigated the direct impact of FOMO on mental health symptoms such as, anxiety and depression, using social media platforms and/or internet use as a mediator and/or contributing variable. Hunt et al.,

(2018) in a study of 143 graduates, found that limiting social media use to 10 minutes per social media platform per day for three weeks had a significant impact on the well-being of students, with reduced symptoms of loneliness, depression, anxiety, and FOMO. This study highlights the possible indirect relationship between social media use, FOMO and wellbeing.

Online studies also indicate the link between FOMO, depression and negative health outcomes. For example, Baker et al. (2016) conducted an online study with 386 undergraduate students to determine whether FOMO is associated with depressive symptoms, mindful attention and physical symptoms (e.g., somatic experiences). The results of their study showed that FOMO was positively associated with social media time, and that higher levels of FOMO were associated with more depressive symptoms, less mindful attention, and more physical symptoms. Interestingly, time spent on social media was not related to depressive symptoms and mindful attention when FOMO was controlled for, which highlights the association between FOMO and negative health outcomes (Baker et al., 2016). While these studies highlight the link between FOMO and psychological distress (i.e., depression and anxiety), they have some limitations. In particular, they did not include and assess an individual's level of self-esteem. Not including a measure of self-esteem can be seen as a weakness, as previous research has shown that self-esteem has a relationship with both psychological distress and FOMO (further discussed in the following sections). Understanding self-esteem, and its relationship with other psychological conditions is extremely valuable in helping to understand current issues faced within the community, as well as helping provide appropriate services within the community. Furthermore, these studies included social media as a variable, even though FOMO can evidently occur without social media usage. This can also be seen as a weakness, as it may lead readers to believe that FOMO can only be experienced through social media platforms.

Self-Esteem

Self-esteem refers to the evaluative component of the self and signifies how people feel about themselves (Abel et al., 2016). Thus, it incorporates the way an individual judges their abilities and capabilities to determine their degree of self-esteem. The Sociometer theory of self-esteem suggests that self-esteem is part of a psychological system that gauges the degree to which individuals perceive that they are relationally valued and socially accepted by others. That is, the Sociometer theory suggests that self-esteem scans and reacts to elements of the social environment that show changes in an individual's connection with friends, family, romantic partner and/or other important groups (Howell et al., 2019; Leary, 2005). Therefore, the motivation for enhancing self-esteem lies in an individual's societal interactions (Buran Kose & Dogan, 2019).

Higher self-esteem has been linked to a range of positive outcomes including, better life satisfaction, higher levels of optimism about the future and better physical health (Howell et al., 2019). On the other hand, low self-esteem has been linked to a range of negative outcomes including, poor mental and physical health and low economic prospects in the adolescent population (Trzesniewski et al., 2006). Low self-esteem is also a risk factor for depressive symptoms (Orth, et al., 2009) and anxiety (Sowislo & Orth, 2013) throughout the lifespan.

Low self-esteem often occurs when an individual perceives and/or experiences social rejection (Howell et al., 2019). It has been linked to higher levels of internet use, and in some instances internet addiction (Armstrong et al., 2000). Furthermore, it has been found that individuals with a large number of friends/followers on social media, more easily lose control over their usage, as they have an overarching need for connectedness and belongingness, which can consequently lead to low self-esteem (Buran Kose & Dogan, 2019).

It has also been suggested that elements of psychological distress (i.e., anxiety and depression) are also linked to self-esteem (Leary, 1990). That is because individuals who perceive rejection and/or lack of social inclusion (associated with self-esteem) experience higher levels of psychological distress as they feel unaccepted, excluded and/or avoided (Leary, 1990).

FOMO and Self-Esteem

It is important to acknowledge the positive and negative outcomes of an individual's level of self-esteem, as these outcomes could also be related to FOMO. That is, if FOMO is linked to an individual's level of self-esteem, we can also assume that FOMO is linked to these positive and negative outcomes too. Some previous research has suggested that an individual's overall degree of self-esteem can decrease due to FOMO, as the experiences that take place in other people's lives can make one's own experiences seem lacking (Luca et al., 2020). Kalpidou (2011) showed that higher usage of Facebook was negatively related to self-esteem. These results highlight that higher social media usage can lead to lower self-esteem and that low self-esteem can lead to higher social media usage. This may be because individuals with low self-esteem often look on social media to see what is happening in other people's lives, which consequently leads to them comparing and evaluating themselves against those people. From a different perspective, individuals with low-self-esteem may turn to social media as they often fear rejection, and social media allows individuals to deal with perceived rejection in an easier way than face-to-face interactions (Buran Kose & Dogan, 2019).

As FOMO refers to individuals comparing themselves to others and perceiving those others are engaging in more rewarding experiences (Riordan et al., 2018), it can be considered a type of upward social comparison. As previously mentioned, upward social

comparisons occur with social connections (and the broader society) when individuals compare their lives to others who they perceive as being better off than they are (Burnell et al., 2019). This can cause individuals to strive to improve, however, it can also have the drawback of decreasing their self-esteem if they don't reach the same level as those they are comparing themselves to. Thus, FOMO may be likened to an upwards social comparison that is driving a reduction in self-esteem if our life is comparatively "boring" or at least "not as interesting/fun" as others.

The Current Study

The current study aims to add to the existing literature by exploring the role of FOMO in psychological health. Whilst previous research has suggested that FOMO, self-esteem, and psychological health are related, there is no previous research that explores the direct relationship between them. The current study aims to examine the relationship between FOMO, psychological distress (i.e., anxiety, depression, and stress) and self-esteem using a mediation model. Based on the current literature, it is proposed that FOMO will have a negative relationship with self-esteem and positive relationship with psychological distress. Throughout the literature, some argue that low self-esteem leads to FOMO, whereas other people argue that high FOMO leads to low self-esteem. To explore this concept further, as well as the relationships between the variables, two different pathways will be investigated (Figure 1). In the first pathway, it is predicted that FOMO will partially mediate the relationship between self-esteem and psychological distress. Individuals who have low self-esteem may more frequently compare themselves to others as a means of feeling adequate and connected, thus leading to FOMO and then greater psychological distress. Alternatively, it is predicted that self-esteem will mediate the relationship between FOMO and psychological distress. Individuals who have higher FOMO may more frequently compare themselves to others, thus leading to low self-esteem and then greater psychological distress.

The current study will also control for participant age. While social media use is not directly measured, it is known that age is strongly correlated to social media use (i.e., younger people are more likely to use social media) (Bell, et.al., 2013; Duggan & Brenner, 2013), and therefore age can be considered a proxy measure of social media use. Based on this reasoning, it is predicted that FOMO will decrease as age increases.

Method

Participants

The current study is a secondary analysis of a subset of data from a study titled “The Impact of Personality and Mental Health Factors on Fear of Missing out”, which was completed by Dr Nicholas Harris at The Australian College of Applied Psychology (ACAP). Ethics was approved through ACAP in 2017 and the study open to participants until 2021. The sample consists of 514 first-year psychology students enrolled at ACAP (114 males, 396 females, 4 other), who were provided with course credit, and 46 members of the general public (15 males, 31 females), who were offered entry into a raffle draw to win one of five \$50 gift cards. The average age of participants was 31.1years (SD= 9.82). Recruitment was completed by affixing poster advertisement on the student board on the ACAP premises and through online advertisement (Facebook) for members of the general public. All participants were required to be over 18 years of age, fluent in English and residing in Australia.

Measures

FOMO was assessed by the 10-item FOMO scale (Przybylski et al., 2013) All items are answered using a 5- point Likert Scale ranging from not at all true of me to extremely true of me. The scale included questions such as “I fear my friends have more rewarding experiences than me”, “I get anxious when I don’t know what my friends are up to” and “it bothers me when I miss an opportunity to meet up with friends”. The FOMO scale has high

levels of reliability and validity ($\alpha = .90$). Please see Appendix C for a copy of the FOMO scale.

Participants completed the 10-item Rosenberg Self-Esteem Scale (Rosenberg, 1965) which measures global self-worth. All items were answered using a 4-point Likert scale ranging from strongly agree to strongly disagree. This scale has well documented reliability and validity in many settings, with an alpha coefficient of 0.86 (Rosenberg, 1965). Please see Appendix D for a copy of the FOMO scale.

The Depression, Anxiety and Stress Scale (DASS21) was used to measure participants psychological distress with subscales for Depression, Anxiety and Stress (Lovibond & Lovibond, 1995). The DASS21 comprises 21 questions requiring participants rate their symptomology over the past week on a 4-point severity/frequency scale, ranging from 0 to 3. Scale scores were created by summing the seven items for each subscale (ranging from 0 to 21). A total Distress scale score was created by summing all item responses (ranging from 0-63). Psychometric properties of the DASS21 scale are well established and documented (e.g., Antony, et al., 1998 Lovibond & Lovibond, 1995), with a Cronbach's alpha of 0.88 for the Distress scale. The Depression subscale has an alpha of 0.91, the Anxiety subscale has an alpha of 0.81 and the Stress subscale has an alpha of 0.89 (Lovibond & Lovibond, 1995). Please see Appendix E for a copy of the FOMO scale.

Procedure

Participants completed an online survey hosted on the Qualtrics platform and were required to read information pertaining to the study and give informed consent. The survey took participants approximately 20-25 minutes to complete. Following demographics, participants completed the above scales in a random order. Upon completion of the study, participants were able to view further information pertaining to the study, including the

research hypotheses. Contact details of the research investigator, as well as a range of professional mental health support organisations were provided. Please see Appendix F for the participant information form.

Data Analysis and Results

Prior to examining the data set and completing the mediation analyses, the data was thoroughly screened and analysed. As noted in the data screening section, some participants' data were removed and were considered missing data. Data was then inspected and winsorizing was used on one extreme variable and outliers were removed from the data set. A factor analysis was then completed on the FOMO scale to determine variability within the scale. Following the data screening process and upon removing some participants' responses, correlation analyses were completed between all of the variables in Jamovi Version 1.6 (The Jamovi Project, 2021). Lastly, mediation analyses were completed through the GLM Mediation Analysis module in Jamovi Version 1.6 to explore the two hypotheses/models.

Results

The following section outlines how data were screened, and descriptive and frequency analyses completed. A factor analysis of the FOMO items will be presented followed by correlational and mediation analyses employing the key variables.

Data Screening

Prior to the analysis, data were checked for normality and outliers. A total of 721 participants originally started the study however, participants' data were removed from the data set if they did not complete the study in entirety and/or if they did not complete the study within an appropriate timeframe (i.e., they completed the study in less than 5 mins. and/or more than 60 mins.). Winsorizing was used to transform one extreme (high) value within the data set (FOMO scale). Three multivariate outliers were found, and these cases were also

removed from the data. A total of 560 participants' data remained for further analysis. Table 1 shows the descriptive statistics of the variables of interest.

Descriptive Statistics, Factor Analysis and Correlations

Descriptive and frequency analyses were conducted in SPSS Version 27 (IBM Corp, 2017). Table 1 includes the skewness and kurtosis statistics for each scale variable. According to conventions, any variable with a kurtosis less than two is considered mesokurtic, with a reasonable range or spread. The self-esteem, FOMO, and anxiety variables met these criteria. Variables with a kurtosis value greater than 2 are considered leptokurtic. This included the depression, stress and distress variables. According to conventions, any variable with a skewness statistic greater than 2 is considered skewed. Depression, anxiety, stress, distress and FOMO were all positively skewed, indicating that the mean of the positively skewed data was greater than the median. Self-esteem was not skewed. A Shapiro-Wilks test was conducted to assess the normality of each variable. All variables violated the assumption of normality ($p < .001$) (Tabachnick & Fidell, 2012). Because of the nature of the constructs measured it was not considered appropriate to transform the scale scores given the analyses are robust to minor violations.

Before conducting the main analyses and given that the FOMO scale is relatively new, exploratory factor analysis using principal axis factoring was conducted on the FOMO scale to determine whether the items converged along a single underlying factor. Results of the factor analysis can be seen in Table 2. The Scree Plot suggests a single factor, which explained 45.1% of the variance among all items. All factor loadings on the unifactor solution loaded above the 0.3 minimum threshold (Tabachnick & Fidell, 2012), further suggesting that FOMO items produce a single factor. A reliability analysis conducted yielded a Cronbach's alpha of 0.89, indicating high internal consistency.

Correlations between all variables (see Table 3) were conducted in Jamovi Version 1.6 (The Jamovi Project, 2021). Age had small to moderate correlations with the other variables and was positively and weakly correlated to self-esteem and negatively and moderately correlated to FOMO and distress. Gender was not correlated with any of the variables. As expected, FOMO had moderate correlations with all of the variables and was negatively and moderately correlated with self-esteem and positively and moderately correlated to distress. As expected, self-esteem had moderate and positive correlations with the distress variable.

In regard to the DASS21 scale created by Lovibond and Lovibond (1995), the Depression scale had a mean of 7.19 (SD=6.54), the Anxiety scale had a mean of 5.23 (SD=4.83) and the Stress scale had a mean of 10.54 (SD=6.94) (Lovibond & Lovibond, 1995). The DASS21 scale within the current study produced relatively consistent results, with the Depression scale producing a mean of 4.78 (SD=4.33), the Anxiety scale producing a mean of 4.30 (SD=3.95) and the Stress scale producing a mean of 7.21 (SD=3.98). These scores indicated less symptoms of depression, anxiety and stress based on the participant responses within the current study (Table 1), as compared to the general population. In regard to the FOMO scale created by Przybylski et al. (2013), the overall FOMO scores were computed by averaging across the raw rating scores, which produced a mean of 2.56 (SD=0.82) for each question/item. The FOMO scale within the current study produced an overall mean of 20.9 (SD=7.97) when considering the FOMO scale in entirety (Table 1). The mean of 20.9 is equivalent to 2.09, which indicates fairly consistent rates of FOMO within the participant responses within the current study, as compared to the general population.

Mediation Analysis

Mediation analyses were conducted using the GLM Mediation Analysis module of Jamovi (The Jamovi Project, 2021) to examine the two different models. Four separate analyses were planned (for each pathway) to explore the mediation effects between FOMO, self-esteem and psychological distress (anxiety, depression, stress, and distress). However, given the strong to very strong correlations between these four variables, and after conducting all four mediation analyses, it was decided to report only the overarching mediation analysis involving distress here to avoid redundancy. Separate analyses for depression, anxiety and stress all produced similar results (see Appendix G). Age was included in the mediation analysis to explore its effects and as a proxy control of social media usage. Gender was excluded in the mediation analysis as it had no correlations with the other variables. Figure 2 summarises the significant findings.

FOMO, Self-Esteem and Psychological Distress

Model One

In terms of direct relationships, self-esteem had a direct, moderate to strong negative relationship with distress ($\beta = -0.53, p < .001$) and FOMO had a small, positive relationship with distress ($\beta = 0.28, p < .001$). Age also had a small, negative direct relationship with distress ($\beta = -0.07, p = 0.02$). Interestingly, but not surprising, age had a moderate, negative path to FOMO ($\beta = -0.32, p < .001$). Self-esteem had a negative and small relationship with FOMO ($\beta = -0.27, p < .001$).

The mediation analyses showed that FOMO had a very small, negative mediating effect on the relationship between age and distress ($\beta = -0.09, p < .001$) and contrary to predictions, there was only a very small mediation effect for FOMO on the relationship between self-esteem and distress ($\beta = -0.08, p < .001$). Although statistically significant, the effect size is so small as to be negligible. The total relationship between self-esteem and

distress was moderate to strong and negative ($\beta = -0.60, p < .001$) and the total relationship between distress and age was weak and negative ($\beta = -0.17, p < .001$).

Overall, these findings indicate that even though FOMO was a mediator between self-esteem and distress, the variance it explains is too small to be meaningful. Thus, it was concluded that FOMO did not mediate the relationship between self-esteem and distress.

Model Two

In terms of direct relationships, FOMO had a direct, small positive relationship with distress ($\beta = 0.28, p < .001$). Age had a small, negative direct relationship with distress ($\beta = -0.08, p = .002$) and a small, positive relationship with self-esteem ($\beta = -.13, p = .002$). Self-esteem had a moderate, negative relationship with distress ($\beta = -0.53, p < .001$) and FOMO had a moderate, positive relationship with self-esteem ($\beta = -.30, p < .001$).

The mediation analyses showed that self-esteem had a small, negative mediating effect on the relationship between age and distress ($\beta = -0.07, p = .002$). Contrary to predictions, there was only a small mediation effect for self-esteem on the relationship between FOMO and distress ($\beta = 0.16, p < .001$). Again, although statistically significant, the effect size is very small. However, there is a superficially larger effect in model two compared to model one. The total relationship between age and distress was small and negative ($\beta = -0.15, p < .001$) and the total relationship between FOMO and distress was small to moderate and positive ($\beta = 0.44, p < .001$). Overall, these findings indicate that self-esteem was a weak mediator between FOMO and distress.

Discussion

The current study aimed to address a gap in the existing literature by examining the relationship between FOMO, psychological distress and self-esteem using a mediation model. Although it was confirmed that FOMO had a negative relationship with self-esteem and a

positive relationship with psychological distress, the mediation hypotheses were not totally supported. Both self-esteem and FOMO independently predicted psychological distress with self-esteem as a weak mediator of FOMO.

Relationships Between FOMO, Self-Esteem and Psychological Distress

Prior to examining the relationships between the variables of interest, the factor analysis completed on the FOMO scale verified that, with this sample, it is indeed a coherent, single construct, consistent with the previous literature (Przybylski et al., 2013). With respect to the correlations, firstly the small negative relationship found between FOMO and self-esteem is consistent with the literature (Luca et al., 2020) and will be further addressed below, along with some potential explanations. Secondly, the current study predicted that FOMO would have a positive relationship with psychological distress, and this was also supported. Interestingly, there were no apparent differences in the relationships between FOMO and anxiety, depression, and stress when the analyses were conducted independently and therefore, a single factor of distress was presented. The moderate positive relationship between FOMO and distress was consistent with previous findings, whereby FOMO had been linked to a range of negative emotional responses such as anxiety, loneliness, less mindful attention, and depression (Baker et al., 2016; Hunt et al., 2013). The relationship between FOMO and distress was an important result to replicate as it has clinical implications for mental health providers as well as the community. For example, ensuring access to a range of appropriate information and services within the community and ensuring that services are targeted to the unique needs within the community.

The current study also found a negative, moderate to strong relationship between self-esteem and psychological distress. This finding is also consistent with previous literature which had found that individuals with lower levels of self-esteem significantly predicted

mental distress (i.e., depression and anxiety related symptomology) (Knowlden et al., 2015). Self-esteem relates to how individuals feel about themselves (Abel et al., 2016) and gauges the degree to which individuals perceive that they are relationally valued and socially accepted by others. Individuals with low self-esteem may be more susceptible to the impacts of life stressors because their coping resources are low, which consequently leads to an increase in overall distress (Marcussen, 2006).

Results of ancillary analysis showed that there was a moderate negative relationship between FOMO and age. While this was not the focus of the current study, it's a relationship that has been previously reported. Most of the previous research in this field has focused on the relationship between FOMO and adolescents and has found that adolescents experience high levels of FOMO, which has been predicted to occur due to problematic social media use (Beyens & Eggermont, 2016; Coskun & Karayagiz, 2019). While the present study did not focus on adolescents, results showed that as age increased reports of FOMO decreased. These results are consistent with the findings from Przybylski et al., (2013) who found that FOMO was negatively related to age. The same study also found that age was negatively related to social media use, meaning that older participants were less engaged with social media, and they also reported higher levels of overall life satisfaction (Przybylski et al., 2013). The finding that age and FOMO are linked, in conjunction with the findings discussed above, suggests that older people may be less susceptible to psychological distress (Australian Institute of Health and Welfare, 2015) and FOMO. Whilst the current study did not include a direct measure of social media use, age may be considered a proxy measure of social media use.

It may be the case that FOMO tends to be a phenomenon primarily grappled with by younger people. This may be because adolescence is a formative period where they are more connected with technology and popular culture (i.e., music, fashion etc.), they have turbulent

relationships with others, difficulties with self-regulation and are beginning to form their identity (National Research Council, 2011). Whereas older adults are less connected with technology and tend to have different values than the adolescent population (Das & Gupta; 1995), which could consequently lead to less FOMO and distress. As technology continues evolving, future research may consider exploring the cohort effect between individuals and technology use and the impact of technology use over time using longitudinal data collection. This is important to know as young people are more vulnerable and are increasingly presenting to mental health clinics and professionals (Australian Institute of Health And Welfare, 2021).

The Mediating Role of FOMO Between Self-Esteem and Psychological Distress

To explore the mediating relationship between the variables, two individual pathways were examined. Both mediation analyses revealed that FOMO had direct relationships with self-esteem (small negative) and psychological distress (moderate positive). However, the mediation analysis showed that the mediated relationships in both pathways were small.

Model One (FOMO Mediates the Relationship Between Self-Esteem and Distress)

Some have argued that individuals with low self-esteem are more likely to experience FOMO as they often compare and evaluate themselves against others (Luca et al., 2020). To explore this concept, model one predicted that individuals with low self-esteem would have higher FOMO and then higher psychological distress as a result. In this pathway, the small, negative relationship found between FOMO and self-esteem is consistent with previous research that shows that individuals with low self-esteem are more likely to experience FOMO. A previous study found that higher Facebook use was negatively related to self-esteem (Kalpidou et al., 2011) and this may have occurred because individuals with low self-esteem tend to browse social media which often leads to social comparisons, thus leading to

FOMO. Contrary to predictions, results from pathway one found that FOMO was a very weak partial mediator of the relationship between self-esteem and distress and added very little to the variance explained in distress.

Model Two (Self-Esteem Mediates the Relationship Between FOMO and Distress)

In comparison to model one, some have argued that individuals with high FOMO are more likely to experience low self-esteem due to upward social comparisons (Luca et al., 2020). To explore this concept, pathway two predicted that individuals with high FOMO would have low self-esteem and psychological distress. In this pathway, the small negative relationship found between FOMO and self-esteem is consistent with the literature that shows an individual's overall degree of self-esteem can decrease due to FOMO (Luca et al., 2020). As previously mentioned, this often occurs due to upward social comparisons (Burnell et al., 2019) whereby self-esteem is decreased if the individual perceives they do not reach the same level as those they are comparing themselves to. This concept also relates to FOMO, whereby FOMO reduces self-esteem if we feel our life is comparatively "not as fun" as others. It could be that individuals with high FOMO tend to compare themselves to others, thus leading to low self-esteem and then increased psychological distress as a result. Results from model two found that self-esteem was a weak partial mediator of the relationship between FOMO and distress. Although the results were considered weak, the effect found in model two was somewhat larger than the effect found in model one. Thus, the results from the current study provide evidence that self-esteem is more likely to mediate the relationship between FOMO and distress compared to FOMO mediating the relationship between self-esteem and distress.

The current study only considered a limited range of factors and thus, there are several areas that future research may consider. One potential factor is personality. There is a growing body of research highlighting the relationship between FOMO and personality

(Hamutoglu et al., 2020; Rozgonjuk et al., 2021), self-esteem and personality (Marcionetti & Rossier, 2016; Wagner & Gerstorfe, 2017) and distress and personality (Benzi et al., 2019; Compare et al., 2016). Given that personality has been linked to the three separate constructs of FOMO, self-esteem and distress, it is possible that personality will have a relationship with the variables in the current study. For example, individuals who are high on agreeableness could experience high FOMO as they are more social and aim to please others, which could then lead to a reduction in self-esteem and an increase in distress. Therefore, future research may consider including personality as an additional variable (i.e., The International Personality Item Pool) (Goldberg, 1992) to explore in the mediation analyses.

A second potential factor that could be explored is attachment. Attachment theory holds that humans have a desire to be close, either physically and/or emotionally with someone that they love as the result of an instinctual behavioural system that evolved to keep infants in close proximity to their caregivers. While attachment theory has been traditionally been used to understand infant and caregiver relationships, it is also an important framework for understanding adolescent and adult relationships (Gillath et.al., 2016). Attachment to others and attachment systems/behaviours can change and evolve over time and impact relationships and bonds with others (i.e., friends, partners, family members etc) (Allen & Tan, 2018). Previous research has demonstrated a relationship between self-esteem and attachment (Gorrese & Ruggieri, 2013) and distress and attachment (Mallinckrodt & Wei, 2005). Additionally, research has also shown a relationship between attachment and FOMO via smartphones/social media platforms (Liu & Ma, 2019; Mannion & Nolan, 2020). That is, investigating the relationship (and impact) of attachment styles on social media use (i.e., to form connections with people online), with social media use then leading to FOMO. Thus, it is also possible that attachment would have a relationship with the variables in the current study. For example, individuals with an insecure attachment style tend to seek constant

reassurance and attention which could increase FOMO, thus leading to reduced self-esteem and increased distress. Whereas someone with a secure attachment style may experience less FOMO and have higher self-esteem and lower distress as they are more satisfied with their relationships. Therefore, future research may also consider including attachment as an additional variable.

A third potential factor to consider in future research is social comparisons. As previously mentioned, FOMO can be thought of as an upward social comparison, due to the innate need of humans to stay socially connected with others (Baumeister, 2012; James et al., 2017). Given that social comparison theory has been linked to FOMO, it is possible that social comparisons will have a relationship with the other variables within the current study. For example; individuals who engage in frequent social comparisons, may evaluate themselves negatively against others, thus leading to a reduction in self-esteem and poorer mental health. Therefore, future research may also consider including a measure of social comparison as an additional variable.

In terms of clinical implications, future research is required to further explore the relationship between FOMO, self-esteem, and distress. In the current study, there is not strong enough evidence to suggest that individuals who have low self-esteem are more likely to experience FOMO and psychological distress (model one). However, there is some evidence to suggest that individuals with high FOMO may be more likely to experience low self-esteem and psychological distress (model two). This is important to note as healthy self-esteem is an important component of recovery and positive health outcomes (Howell et al., 2019). For example; self-esteem contributes to good mental health and physical health, and poor self-esteem contributes to a range of factors, including, but not limited to; depression, anxiety, alcohol/drug abuse, unhealthy eating, criminality and poor performance (Schiraldi,

2016). Therefore, even though the mediation analyses were not as strong as predicted, it is still important to address self-esteem.

Limitations

There are several limitations to the present study. Firstly, it is cross-sectional and correlational, meaning that the study only captured participants' responses at one time point and thus, no causal relationships can be concluded. This may also be problematic as an individuals' degree of self-esteem, distress and FOMO can vary and change over time as a response to various factors (i.e., external factors, environmental/psychosocial challenges, social interactions etc.). Future research would benefit from longitudinal data collection as this would allow for a better understanding of the nature of the relationships between the variables (i.e., data collected sequentially over a 6–12-month period).

It is also important to consider that some of the data for this study was collected in the context of the COVID-19 pandemic. As COVID-19 is a relatively recent health issue (i.e., less than 3 years), there is limited longitudinal data available. However, there is a growing body of research that has shown an increase in mental health problems such as depression and anxiety since COVID-19 (Gao et al., 2020). It is also possible that COVID-19 may have affected some of responses within the current study. An opportunity for future research may be to examine whether there are any changes in participants' responses over time because of COVID-19.

Thirdly, the present study focused on a non-clinical sample of participants who typically reported lower levels of psychological distress. Furthermore, most participants were in early adulthood (i.e., average age of participants was 31.1 years) and there was a significantly higher proportion of females than males (129 males, 427 females). While the current study had a generous sample size, the results did not show any gender effects. This could be due to the discrepancy between male and female participants or the sample of

participants itself. Therefore, future research should ensure a balanced sample of both male and female participants to explore whether there are any underlying gender effects between the variables. Furthermore, whilst some of the participants were from the general community, most of the participants were first-year psychology students from ACAP. It is important to study these variables in community samples and clinical samples as the mediating effect of FOMO may manifest with high levels of distress which our study did not capture.

Fourthly, the present study relied on self-reports. Whilst there are many advantages of self-report measures (i.e., accessibility, cost effectiveness etc.) there are also some potential issues that could influence self-report ratings. For example, participants may provide socially desirable responses (Bersoff & Bersoff, 1999). To combat these limitations in future research there are a few potential options that could be considered. Firstly, it may be beneficial to use a mixed methods approach whereby, participants complete self-reports, face-to-face interviews and/or observational/physiological measures. Secondly, future research could include a measure of social desirability and impression management in the questionnaires to determine this impact on the data. Thirdly, future research may choose to use more direct measures of the variables. Whilst the DASS has well established psychometric properties (Lovibond & Lovibond, 1995) it is a screening measure and not optimised for distinguishing between depression, anxiety and stress. More focused measures that have strong psychometric properties such as; Beck's Depression Inventory (Beck et al., 1961), Beck's Anxiety Inventory (Beck et al., 1988) and/or The Perceived Stress Scale (Cohen et al., 1983) may better help to evaluate and distinguish the separate constructs of depression, anxiety and stress. This would be important to determine whether there are any differences between depression, anxiety and stress and their relationship/s with the other variables. The current study created the single construct of distress because separate analyses for depression,

anxiety and stress all produced similar results. Perhaps this occurred due to the DASS21 not accurately capturing the unique differences between each construct.

Finally, as the current study used a subset of data, it only included a limited range of factors. Consequently, the current study did not include a direct measure of social media use. As mentioned, previous research in this area includes social media usage to examine the relationship among variables and thus, not including social media could be considered a limitation of the current study. However, the current study does include a measure of age, which could be seen as a proxy measure of social media use. However, future research may consider using a more direct measure of social media use to explore its relationship between the variables.

Strengths

The present study has several strengths. Whilst previous research has suggested that FOMO, self-esteem, and distress are related, there are no studies that examine these variables simultaneously, as well as the direct relationship between them. Another strength of the current study was the sample size. Whilst the previous section discussed some potential limitations to the sample (i.e., non-clinical sample), the overall sample size was quite generous (total participants, 560). The sample size and younger population could be considered a strength for the purposes of the current study as FOMO is most prevalent in the younger population.

Conclusion

The current study is the first to examine the direct and mediated relationships between self-esteem, FOMO and psychological distress. It provides evidence of small to moderate relationships between FOMO, self-esteem and distress. Contrary to predictions FOMO had a small negative effect on the relationship between self-esteem and distress however, the variance explained was small and thus it was concluded that FOMO did not effectively

mediate the relationship between self-esteem and distress. Also contrary to predictions, self-esteem had a small negative effect on the relationship between FOMO and distress. While we found some support for the theory that individuals with low self-esteem are likely to experience FOMO and distress, our research suggests that there may be other factors and mediators to consider when exploring the mechanisms of self-esteem's relationship with distress. This is an important area of research that has implications for both mental health services and the community. Results from the present study and recommendations for future research will hopefully encourage researchers to continue exploring the relationships between these constructs.

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Table 2*Factor Analysis/Loadings for the FOMO Scale.*

	Factor	Uniqueness
	1	
Item 1	0.719	0.483
Item 2	0.709	0.497
Item 3	0.811	0.343
Item 4	0.767	0.412
Item 5	0.591	0.651
Item 6	0.655	0.571
Item 7	0.672	0.548
Item 8	0.425	0.819
Item 9	0.737	0.457
Item 10	0.537	0.712

Table 3*Pearson correlations between age, gender, FOMO, Self Esteem, Distress, Anxiety, Depression and Stress.*

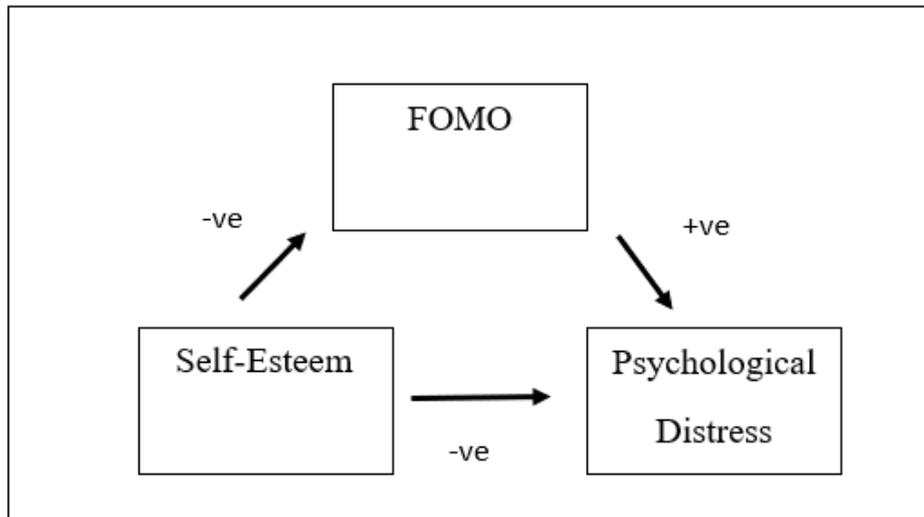
Variable	1	2	3	4	5	6	7
1. Age							
2. FOMO	-0.387***	—					
3. Self Esteem	0.247***	0.349***	—				
4. Distress	-0.315***	0.493***	-0.645***	—			
5. Anxiety	-0.342***	0.468***	-0.513***	0.903***	—		
6. Depression	-0.288***	0.443***	-0.686***	0.910***	0.728***	—	
7. Stress	-0.225***	0.430***	0.544***	0.903***	0.734***	0.728***	—

* $p < .05$, ** $p < .01$, *** $p < .001$

Figures

Figure 1

The Hypothesised Partial Mediation Model One



The Hypothesised Partial Mediation Model Two

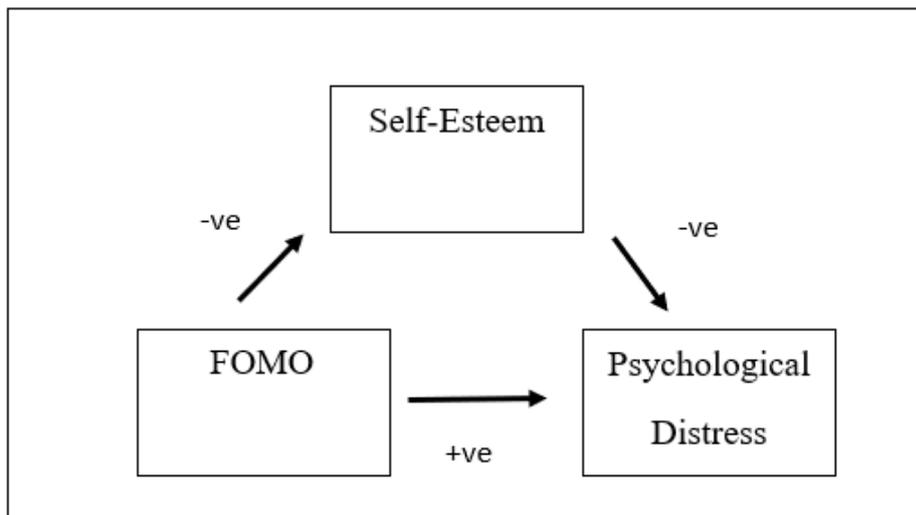
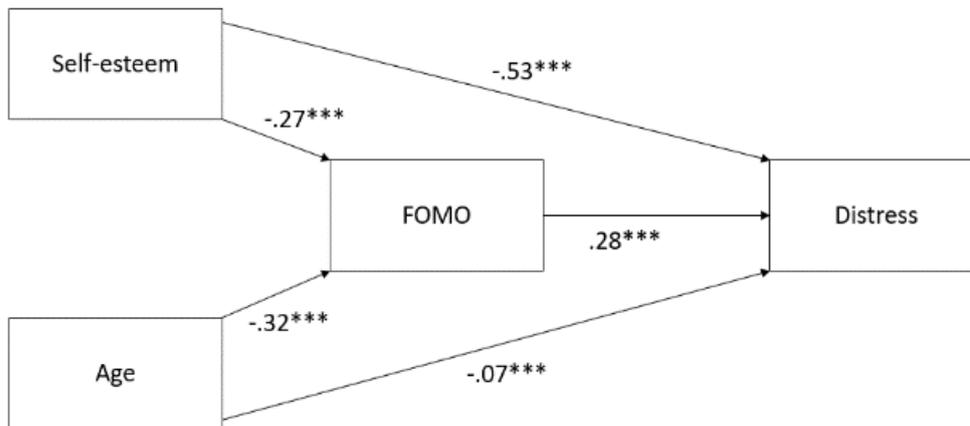


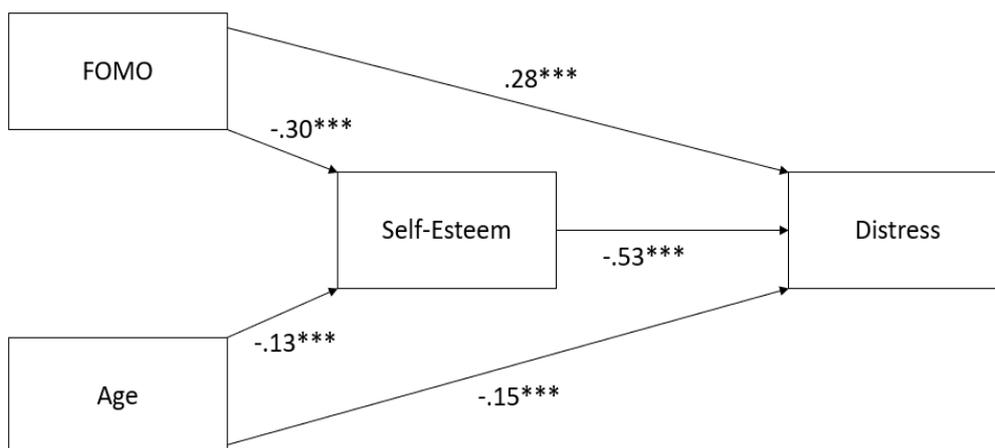
Figure 2

The Observed Mediation model of FOMO Mediating the effect between Self-Esteem and Distress- Model One.



* $p < .05$, ** $p < .01$, *** $p < .001$

The Observed Mediation model of FOMO Mediating the effect between Self-Esteem and Distress- Model Two.



* $p < .05$, ** $p < .01$, *** $p < .001$

Appendix A: Journal Submission Requirements.

Retrieved 7th July 2021 from:

<https://www.guilford.com/periodicals/jnscinst.pdf>

Instructions for Authors

The *Journal of Social and Clinical Psychology* is devoted to the application of theory and research from social psychology toward the better understanding of human adaptation and adjustment, including both the alleviation of psychological problems and distress (e.g., psychopathology) and the enhancement of psychological well-being among the psychologically healthy. Topics of interest include (but are not limited to) traditionally defined psychopathology (e.g., depression), common emotional and behavioral problems in living (e.g., conflicts in close relationships), the enhancement of subjective well-being, and the processes of psychological change in everyday life (e.g., self-regulation) and professional settings (e.g., psychotherapy and counseling). Articles reporting the results of theory-driven empirical research are given priority, but theoretical and review articles are also welcome. Articles describing the development of new scales (personality or otherwise) or the revision of existing scales are not appropriate.

All submissions must be made electronically (preferably in Microsoft Word format) to **Thomas E. Joiner** at joiner@psy.fsu.edu. Only original articles will be considered. Articles should not exceed 8,000 words (text and references). Exceptions may be made for reports of multiple studies. Authors desiring an anonymous review should request this in the submission letter. In such cases identifying information about the authors and their affiliations should appear only on a cover page.

ABSTRACTS must be structured (**Introduction, Methods, Results, Discussion**) and succinct.

TABLES should be submitted in Excel. Tables formatted in Microsoft Word's Table function are also acceptable. (Tables should not be submitted using tabs, returns, or spaces as formatting tools.)

FIGURES must be submitted separately as graphic files (in order of preference: tif, jpg, bmp, gif; note that PowerPoint and PDFs are not acceptable) in the highest possible resolution. Figure caption text should be included in the article's Microsoft Word file. All figures must be in black and white.

PERMISSIONS: Contributors are responsible for obtaining permission from copyright owners if they use an illustration, table, or lengthy quote (100+ words) that has been published elsewhere. Contributors should write both the publisher and author of such material, requesting nonexclusive world rights in all languages for use in the article and in all future editions of it.

SUPPLEMENTAL MATERIALS: Supplemental materials will run **online-only** and should be no longer than the manuscript itself. If the material you wish to include is longer than the article, we will instead include a note that all supplemental material can be obtained, by request, from the author. Supplemental materials in the form of tables and figures must comply with the above table and figure instructions for the main article. Remember to include

call-outs for all figures and tables within the supplemental material. Supplemental material files will be uploaded online as supplied. They will not be checked for accuracy, copyedited, typeset or proofread.

REFERENCES: Authors should consult the publication manual of the American Psychological Association for rules on format and style. All research papers submitted to the Journal of Social and Clinical Psychology must conform to the ethical standards of the American Psychological Association. Articles should be written in nonsexist language. **Any manuscripts with references that are incorrectly formatted will be returned to the author for revision.**

SAMPLE REFERENCES

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Appendix B: Ethics Approval

HUMAN RESEARCH ETHICS COMMITTEE



Notification of Expedited Approval

To Chief Investigator or Project Supervisor:	Associate Professor Ross Wilkinson
Cc Co-investigators / Research Students:	Miss Shannen Aungiers
Re Protocol:	The impact of personality and mental health factors on fear of missing out
Date:	08-Mar-2021
Reference No:	H-2020-0390

Thank you for your Response to Conditional Approval submission to the Human Research Ethics Committee (HREC) seeking approval in relation to the above protocol.

Your submission was considered under Expedited review by the Ethics Administrator.

We are pleased to advise that the decision on your submission is **Approved** effective 08-Mar-2021.

In approving this protocol, the Human Research Ethics Committee (HREC) is of the opinion that the project complies with the provisions contained in the National Statement on Ethical Conduct in Human Research, 2007, and the requirements within this University relating to human research.

Approval will remain valid subject to the submission, and satisfactory assessment, of annual progress reports. *If the approval of an External HREC has been "noted" the approval period is as determined by that HREC.*

The full Committee will be asked to ratify this decision at its next scheduled meeting. A formal *Certificate of Approval* will be available upon request. Your approval number is H-2020-0390.

If the research requires the use of an Information Statement, ensure this number is inserted at the relevant point in the Complaints paragraph prior to distribution to potential participants You may then proceed with the research.

Conditions of Approval

This approval has been granted subject to you complying with the requirements for *Monitoring of Progress, Reporting of Adverse Events, and Variations to the Approved Protocol* as detailed below.

PLEASE NOTE:

In the case where the HREC has "noted" the approval of an External HREC, progress reports and reports of adverse events are to be submitted to the External HREC only. In the case of Variations to the approved protocol, or a Renewal of approval, you will apply to the External HREC for approval in the first instance and then Register that approval with the University's HREC.

- *Monitoring of Progress*

Other than above, the University is obliged to monitor the progress of research projects involving human participants to ensure that they are conducted according to the protocol as approved by the HREC. A progress report is required on an annual basis. Continuation of your HREC approval for this project is conditional upon receipt, and satisfactory assessment, of annual progress reports. You will be advised when a report is due.

- *Reporting of Adverse Events*

1. It is the responsibility of the person first named on this Approval Advice to report adverse events.
2. Adverse events, however minor, must be recorded by the investigator as observed by the investigator or as volunteered by a participant in the research. Full details are to be documented, whether or not the investigator, or his/her deputies, consider the event to be related to the research substance or procedure.
3. Serious or unforeseen adverse events that occur during the research or within six (6) months of completion of the research, must be reported by the person first named on the Approval Advice to the (HREC) by way of the Adverse Event Report form (via RIMS at <https://rims.newcastle.edu.au/login.asp>) within 72 hours of the occurrence of the event or the investigator receiving advice of the event.
4. Serious adverse events are defined as:
 - Causing death, life threatening or serious disability.
 - Causing or prolonging hospitalisation.
 - Overdoses, cancers, congenital abnormalities, tissue damage, whether or not they are judged to be caused by the investigational agent or procedure.
 - Causing psycho-social and/or financial harm. This covers everything from perceived invasion of privacy, breach of confidentiality, or the diminution of social reputation, to the creation of psychological fears and trauma.
 - Any other event which might affect the continued ethical acceptability of the project.
5. Reports of adverse events must include:
 - Participant's study identification number;
 - date of birth;
 - date of entry into the study;
 - treatment arm (if applicable);
 - date of event;
 - details of event;
 - the investigator's opinion as to whether the event is related to the research procedures; and
 - action taken in response to the event.
6. Adverse events which do not fall within the definition of serious or unexpected, including those reported from other sites involved in the research, are to be reported in detail at the time of the annual progress report to the HREC.

- *Variations to approved protocol*

If you wish to change, or deviate from, the approved protocol, you will need to submit an *Application for Variation to Approved Human Research* (via RIMS at <https://rims.newcastle.edu.au/login.asp>). Variations may include, but are not limited to, changes or additions to investigators, study design, study population, number of participants, methods of recruitment, or participant information/consent documentation. Variations must be approved by the (HREC) before they are implemented except when Registering an approval of a variation from an external HREC

which has been designated the lead HREC, in which case you may proceed as soon as you receive an acknowledgement of your Registration.

Linkage of ethics approval to a new Grant

HREC approvals cannot be assigned to a new grant or award (ie those that were not identified on the application for ethics approval) without confirmation of the approval from the Human Research Ethics Officer on behalf of the HREC.

Best wishes for a successful project.

Human Research Ethics Committee

For communications and enquiries:

Human Research Ethics Administration

Research & Innovation Services

Research Integrity Unit

The University of Newcastle

Callaghan NSW 2308

T +61 2 492 17894

Human-Ethics@newcastle.edu.au

RIMS website - <https://RIMS.newcastle.edu.au/login.asp>

Linked University of Newcastle administered funding:

Funding body	Funding project title	First named investigator	Grant Ref

Appendix C: FOMO Scale

Przybylski, A. K., Murayama, K., DeHaan, C. R., & Gladwell, V. (2013). Motivational, emotional, and behavioral correlates of fear of missing out. *Computers in Human Behavior*, 29(4), 1841–1848. <https://doi.org/10.1016/j.chb.2013.02.014>

Please read each statement below and indicate to what extent each statement is true of you. Try to rate each statement as honestly and accurately as possible.

The Rating Scale is as follows:

- 1- Not at all true of me
- 2- Slightly true of me
- 3- Moderately true of me
- 4- Very true of me
- 5- Extremely true of me

Item

1. I fear others having more rewarding experiences than me.
2. I fear my friends have more rewarding experiences than me.
3. I get worried when I find out my friends are having fun without me.
4. I get anxious when I don't know what my friends are up to.
5. It is important that I understand my friends "in jokes".
6. Sometimes, I wonder if I spend too much time keeping up with what is going on.
7. It bothers me when I miss an opportunity to meet up with friends.
8. When I have a good time it is important for me to share the details online (e.g. updating status).
9. When I miss out on a planned get-together it bothers me.
10. When I go on vacation, I continue to keep tabs on what my friends are doing.

Appendix D: Self-Esteem Scale

Rosenberg, M. (1965). *Society and the Adolescent Self-Image* (Princeton Legacy Library).
Princeton University Press.

Please read each statement below and indicate to what extent you agree or disagree with the statement. Try to rate each statement as honestly and accurately as possible. There is no right or wrong answer. Do not spend too much time on any statement.

The Rating Scale is as follows:

- 1- Strongly Disagree
- 2- Disagree
- 3- Agree
- 4- Strongly Agree

Item

- 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 that I could have more respect for myself.
- 9. All in all, I am inclined to think I am a failure.
- 10. I take a positive attitude toward myself.

Appendix E: Depression, Anxiety, Stress Scale

Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour Research and Therapy*, 33(3), 335–343.

[https://doi.org/10.1016/0005-7967\(94\)00075-u](https://doi.org/10.1016/0005-7967(94)00075-u)

Please read each statement and indicate how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

The Rating Scale is as follows:

- 0- Never
- 1- Sometimes
- 2- Often
- 3- Always

Item

1. I found it hard to wind down.
2. I was aware of dryness of my mouth.
3. I couldn't seem to experience any positive feeling at all.
4. I experienced breathing difficulty (eg. Excessively rapid breathing, breathlessness in the absence of physical exertion).
5. I found it difficult to work up the initiative to do things.
6. I tended to over-react to situations.
7. I experienced trembling (eg. In the hands).
8. I felt that I was using a lot of nervous energy.
9. I was worried about situations in which I might panic and make a fool of myself.
10. I felt that I had nothing to look forward to.
11. I found myself getting agitated.
12. I found it difficult to relax.
13. I felt down-hearted and blue.
14. I was intolerant of anything that kept me from getting on with what I was doing.
15. I felt I was close to panic.
16. I was unable to become enthusiastic about anything.
17. I felt I wasn't worth much as a person.
18. I felt that I was rather touchy.
19. I was aware of the action of my heart in the absence of physical exertion (eg. Sense of heart rate increase, heart missing a beat).
20. I felt scared without any good reason.
21. I felt life was meaningless.

Appendix F: Participant Information Form

The impact of personality and mental health factors on fear of missing out.

ACAP HREC Approval Number 353310517

Researcher's Name: Dr Nicholas Harris

Researcher's Relationship to ACAP: Senior Lecturer

(1) What is the study about?

You are invited to participate in a study that investigates the effect of self-esteem, neuroticism, extraversion, and obsessive-compulsive tendencies on the fear of missing out. This study involves answering questions relating to levels of depression, anxiety, personality traits, self-esteem, obsessive-compulsive tendencies, and feelings of fear of missing out. It may make you feel anxious. If you do feel uncomfortable, you can discontinue the study at any point and you can contact any of the below support services. ACAP Student Counselling Services

Sydney: (02) 9964 6355

Brisbane: (07) 3234 4429

Melbourne: (03) 8613 0630

Beyond Blue: 1300 22 4636

Lifeline: 13 11 14

(2) Who is carrying out the study?

The research is being conducted by Dr. Nicholas Harris, a lecturer at ACAP.

(3) What does the study involve?

If you decide to participate in the study, you will participate by completing an online survey. You will be asked 2 demographic questions related to age and gender. You will also be asked to complete six sections comprising 99 questions in relation to your self-esteem, extraversion, neuroticism, obsessive-compulsive tendencies, anxiety and depression, and levels of fear of missing out that you might have experienced recently. Your name and/or any other identifying information will not be included to ensure that you are not identifiable in the report resulting from your answers to the survey questionnaires.

(4) How much time will the study take?

The study will take approximately 30-60 minutes.

(5) Will I incur any costs by participating in the study?

Participation is entirely voluntary. There is no reimbursement, except for 2 SONA participation points.

(6) Can I tell other people about the study?

You can encourage other people to participate, however, to ensure that data is not contaminated, it is best if you do not discuss the details of this study with other people.

(7) Will I receive the results of the study?

If you wish to receive a summary of the results of the study, please contact Dr. Nicholas Harris at the School of Psychological Sciences at the Australian College of Applied Psychology (e-mail: Nicholas.Harris@acap.edu.au; tel. (02) 8236 8061).

(8) Confidentiality and disclosure of information

You will not be able to be identified from your participation in this study, as your survey will contain no identifying information. Please be aware that although you cannot be identified from your survey responses, no computer transmission can be perfectly secure. Nevertheless, we have made every effort to protect the security of your data. I plan to present the results of the research at an academic conference and publish them in a reputable academic journal. In any publication, information will be provided in such a way that you cannot be identified. Data from this research will be retained for at least five years in order to be able to validate or replicate the research, and to prove ownership of intellectual property.

(9) Can I withdraw from the study?

Participation in this study is voluntary - you are not under any obligation to consent and your decision not to consent will in no way affect your relationship with the Australian College of Applied Psychology. But please be aware that submitting a completed survey is an indication of your consent to participate in the study. If you begin the survey and decide you do not want to continue, simply close the computer screen. Once you have submitted your survey anonymously, your responses cannot be withdrawn, as all data are de-identified.

(10) How can I obtain further information?

When you have read this information, Nicholas can discuss it with you further and answer any questions you may have. If you would like to know more at any stage, please feel free to contact the Dr. Nicholas Harris (e-mail: nicholas.harris@acap.edu.au; tel. (02) 8236 8061).

(11) What can I do if I have a complaint or a concern?

Any concerns or complaints about the conduct of this study should be directed to the: *ACAP HREC Secretary Australian College of Applied Psychology Locked Bag 11, Strawberry Hills NSW 2012. Email: hrecsecretary@acap.edu.au.* Any complaint will be investigated promptly, and you will be informed of the outcome. **This information sheet is for you to keep.**

Q21 A SPECIAL NOTE ABOUT THE NATURE OF THE INFORMATION COLLECTED IN THIS STUDY

In the course of this study, we will be collecting information about issues which may, at times, have an intense personal significance for some participants. If you find that you are troubled by any of the information collected in the course of this study, and need support or counselling, please be sure to pursue that external support by seeking out a counsellor and/or a social service. A sample of counselling and social services resources that are available in the Sydney and New South Wales region are as follows: Disclaimer: We do not assume any responsibility for the quality of the services offered by the following organizations. **These services provided FREE** Mental Health Line (24 hours) 1800 011 511 Mission Australia Helpline 1300 886 999 Catholic Care Relationship Counselling (02) 9283 4899 Lifeline 13 11 14 Relationships Australia (02) 9418 8800 or 1300 364 277 Salvo Crisis Line (02) 9331 2000 (suicide prevention 24 hour) Victim's Services 1800 633 063 **Other** The Lionel Davis Australian College of Applied Psychology Psychology Clinic (02) 8236-8070

Appendix G: Separate Analyses for Depression, Anxiety and Stress.**Pathway One: FOMO Mediates the Relationship Between Self-Esteem and Distress***Mediation Effects Between Self-Esteem, FOMO and Depression.*

Type	Effect	Estimate	SE	β	p-value
Indirect	Self-Esteem \Rightarrow FOMO \Rightarrow Depression	-0.0429	0.00909	-0.0570	< .001
	Age \Rightarrow FOMO \Rightarrow Depression	-0.0298	0.00590	-0.0676	< .001
Component	Self-Esteem \Rightarrow FOMO	-0.3740	0.05333	-0.2703	< .001
	FOMO \Rightarrow Depression	0.1146	0.01799	0.2110	< .001
	Age \Rightarrow FOMO	-0.2601	0.03129	-0.3205	< .001
Direct	Self-Esteem \Rightarrow Depression	-0.4491	0.02368	-0.5975	< .001
	Age \Rightarrow Depression	-0.0259	0.01412	-0.0588	0.066
Total	Self-Esteem \Rightarrow Depression	-0.4919	0.02353	-0.6546	< .001
	Age \Rightarrow Depression	-0.0557	0.01381	-0.1264	< .001

Mediation Effects Between Self-Esteem, FOMO and Stress.

Type	Effect	Estimate	SE	β	p-value
Indirect	Age \Rightarrow FOMO \Rightarrow Stress	-0.03504	0.00650	-0.08655	< .001
	Self-Esteem \Rightarrow FOMO \Rightarrow Stress	-0.05038	0.01012	-0.07300	< .001
Component	Age \Rightarrow FOMO	-0.26011	0.03129	-0.32049	< .001
	FOMO \Rightarrow Stress	0.13471	0.01905	0.27006	< .001
	Self-Esteem \Rightarrow FOMO	-0.37397	0.05333	-0.27031	< .001
Direct	Age \Rightarrow Stress	-0.00388	0.01495	-0.00959	0.795
	Self-Esteem \Rightarrow Stress	-0.30874	0.02507	-0.44740	< .001
Total	Age \Rightarrow Stress	-0.03892	0.01473	-0.09614	0.008
	Self-Esteem \Rightarrow Stress	-0.35911	0.02511	-0.52040	< .001

Mediation Effects Between Self-Esteem, FOMO and Anxiety.

Type	Effect	Estimate	SE	β	p-value
Indirect	Age \Rightarrow FOMO \Rightarrow Anxiety	-0.0363	0.00655	-0.0902	< .001
	Self-Esteem \Rightarrow FOMO \Rightarrow Anxiety	-0.0522	0.01023	-0.0761	< .001
Component	Age \Rightarrow FOMO	-0.2601	0.03129	-0.3205	< .001
	FOMO \Rightarrow Anxiety	0.1395	0.01875	0.2814	< .001
	Self-Esteem \Rightarrow FOMO	-0.3740	0.05333	-0.2703	< .001
Direct	Age \Rightarrow Anxiety	-0.0559	0.01471	-0.1389	< .001
	Self-Esteem \Rightarrow Anxiety	-0.2608	0.02468	-0.3802	< .001
Total	Age \Rightarrow Anxiety	-0.0922	0.01457	-0.2291	< .001
	Self-Esteem \Rightarrow Anxiety	-0.3130	0.02483	-0.4563	< .001

Pathway Two: Self-Esteem Mediates the Relationship Between FOMO and Distress*Mediation Effects Between FOMO, Self-Esteem and Depression.*

Type	Effect	Estimate	SE	β	p-value
Indirect	FOMO \Rightarrow Self-Esteem \Rightarrow Depression	0.0969	0.0147	0.1784	< .001
	Age \Rightarrow Self-Esteem \Rightarrow Depression	-0.0346	0.0114	-0.0785	0.002
Component	FOMO \Rightarrow Self-Esteem	-0.2158	0.0308	-0.2986	< .001
	Self-Esteem \Rightarrow Depression	-0.4491	0.0237	-0.5975	< .001
	Age \Rightarrow Self-Esteem	0.0770	0.0250	0.1313	0.002
Direct	FOMO \Rightarrow Depression	0.1146	0.0180	0.2110	< .001
	Age \Rightarrow Depression	-0.0259	0.0141	-0.0588	0.066
Total	FOMO \Rightarrow Depression	0.2115	0.0221	0.3894	< .001
	Age \Rightarrow Depression	-0.0605	0.0180	-0.1372	< .001

Mediation Effects Between FOMO, Self-Esteem and Stress.

Type	Effect	Estimate	SE	β	p-value
Indirect	FOMO \Rightarrow Self-Esteem \Rightarrow Stress	0.06664	0.01094	0.13360	< .001
	Age \Rightarrow Self-Esteem \Rightarrow Stress	-0.02379	0.00795	-0.05875	0.003
Component	FOMO \Rightarrow Self-Esteem	-0.21584	0.03078	-0.29861	< .001
	Self-Esteem \Rightarrow Stress	-0.30874	0.02507	-0.44740	< .001
	Age \Rightarrow Self-Esteem	0.07704	0.02498	0.13132	0.002
Direct	FOMO \Rightarrow Stress	0.13471	0.01905	0.27006	< .001
	Age \Rightarrow Stress	-0.00388	0.01495	-0.00959	0.795
Total	FOMO \Rightarrow Stress	0.20135	0.02061	0.40366	< .001
	Age \Rightarrow Stress	-0.02767	0.01672	-0.06835	0.098

Mediation Effects Between FOMO, Self-Esteem and Anxiety.

Type	Effect	Estimate	SE	β	p-value
Indirect	FOMO \Rightarrow Self-Esteem \Rightarrow Anxiety	0.0563	0.00963	0.1135	< .001
	Age \Rightarrow Self-Esteem \Rightarrow Anxiety	-0.0201	0.00679	-0.0499	0.003
Component	FOMO \Rightarrow Self-Esteem	-0.2158	0.03078	-0.2986	< .001
	Self-Esteem \Rightarrow Anxiety	-0.2608	0.02468	-0.3802	< .001
	Age \Rightarrow Self-Esteem	0.0770	0.02498	0.1313	0.002
Direct	FOMO \Rightarrow Anxiety	0.1395	0.01875	0.2814	< .001
	Age \Rightarrow Anxiety	-0.0559	0.01471	-0.1389	< .001
Total	FOMO \Rightarrow Anxiety	0.1958	0.01971	0.3950	< .001
	Age \Rightarrow Anxiety	-0.0760	0.01599	-0.1889	< .001