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Can we improve self-esteem by reducing Instagram usage, via a novel online imagery intervention?

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Abstract

Self-esteem has far-reaching effects on our lives. Low self-esteem can cause negative body image and depression, and therefore it is vital for psychologists to find ways to improve individuals' self-esteem. Recent research has shown that social media usage is negatively associated with self-esteem, prompting the theory that interventions which reduce individuals' social media usage could result in higher levels of self-esteem. Our study aimed to test this theory by using a novel online imagery intervention, developed from Functional Imagery Training (FIT), to reduce Instagram usage in participants from Plymouth University. Results showed that the novel online imagery intervention was not successful in reducing Instagram usage, nor was there a significant negative correlation between Self-esteem and Instagram usage. In conclusion: This is the first study to attempt to reduce Instagram usage via an online imagery intervention and should therefore be used as a basis for further studies, despite its limitations.

Keywords: Functional Imagery Training (FIT), Novel Intervention, Self-esteem, Instagram, Body image, Social media usage, Online study.

Introduction

High self-esteem is the gift that keeps on giving. Linked to the quality of our relationships, our happiness at work, and the decisions we make (Swann et al., 2007), there is little doubt that high self-esteem is crucial for humans' overall psychological wellbeing and life satisfaction (Boden et al., 2008; Moksnes & Reidunsdatter, 2019). Far from being a vague and insubstantial notion of confidence, self-esteem is a potent measure of the faith we have in our own worth and abilities (Rosenberg, 1965). It is the evaluation, be it positive or negative, we make of ourselves (Hawi & Samaha, 2016) and therefore reflects the attitude we have towards our self-concept (everything we objectively know about ourselves; Heatherton & Wyland, 2003). Consequently, self-esteem has real and powerful effects on the direction our lives take.

Case in point, a study on African-American women experiencing intimate partner violence found that low self-esteem made women more likely to stay in their abusive relationships (Bliss, Ogleby-Oliver, Jackson, Harp & Kaslow, 2008). Furthermore, various studies have shown low self-esteem to be an important factor in the development of eating disorders (Vohs et al., 2001; Waller et al., 2002), depression (Orth et al., 2008; Sharma & Agarwala, 2014) and negative body image (Ahadzadeh et al., 2018; Paxton et al., 2006). The severity of these examples demonstrates how vitally important it is for psychologists to study the ways in which self-esteem can be increased. However, the first step to realising potential treatments for low self-esteem is to study the factors *causing* low self-esteem. Recent research (e.g., Liu et al., 2017; Wang et al., 2017) in this area has highlighted the role of social media as one such important factor.

Social media's popularity has risen rapidly in recent years, becoming a huge part of our daily lives and changing the way we communicate with others (Tobin & Chulpaiboon, 2016). More of us are engaging in scrolling, liking and photo-uploading than ever before, with statistics showing a sharp rise in Instagram users, from 800 million in September 2017 to 1 billion in June 2018 (Statista, 2021), and a staggering 2.7 billion Facebook users recorded in 2020 (Statista, 2021). With such a large amount of the world's population subscribing to social media, psychologists have inevitably become interested in the long- and short-term effects of using these online platforms. This interest has coincided with an observed rise in depression, anxiety and suicide in US adolescents since 2007 (around the time that social media apps such as Tumblr were launched, and Facebook added its 'news feed' feature, where users could view a constant stream of pictures and posts related to their friends; Attu & Terras, 2017; Curtin, 2020; DeVito, 2017). As discussed above, low self-esteem leaves us vulnerable to mental health problems, and so in their research regarding social media, psychologists have focussed on the relationship between social media use and self-esteem.

Whilst certain studies (e.g., Huang, 2016; Meier & Schafer, 2018) posit the benefits of social media, the majority of findings indicate that self-esteem decreases as social media use increases (e.g., Schmuck et al., 2019; Vogel et al., 2014; Wang et al., 2017). For example, a study by Vogel et al. (2014) used questionnaires to test university undergraduates on the frequency of their Facebook use and their self-esteem, with results displaying a negative correlation between the two. Similarly, the study by Schmuck et al. (2019) found a significant negative effect of Facebook use on self-esteem, although no significant results for Youtube, Instagram, Whatsapp or

Snapchat. Whilst this could indicate that Facebook is potentially more harmful than other social media sites, the researchers (Schmuck et al., 2019) noted that participants reported using Facebook more frequently than the other sites tested. This raises an important distinction between ordinary social media use and frequent social media use; it may be that checking and using social media only becomes harmful when it is done regularly and repeatedly. This type of social media use could be classed as addictive, in that users experience the same withdrawal, relapse and mood modification behaviours as individuals with drug and alcohol addictions (Andreasson, 2015).

For example, a review by Ryan et al. (2014) analysed 24 studies of Facebook addiction and found evidence that users checked Facebook to improve their mood, indicating an unhealthy reliance on the social media site. This level of dependence may work to reduce self-esteem in the long-term. However, there is uncertainty in this field of research as psychologists have been unable to determine whether social media addiction causes a decrease in self-esteem, or whether pre-existing low self-esteem causes an unhealthy reliance on social media. For instance, a study by Hawi and Samaha (2016) found that addictive use of social media was negatively associated with self-esteem, but it was concluded that existing low self-esteem had caused participants to use social media more frequently. Similarly, a study by Kose and Dugan (2019) found a negative correlation between social media addiction and self-esteem, but could not draw any reliable causal conclusions. To enable psychologists to establish causal relationships between social media use and self-esteem in future studies, it is imperative that experiment designs be longitudinal in nature. Nevertheless, a review by the aforementioned Andreasson (2015) concluded that whilst social media addiction does not currently have a formal diagnosis, it can have real and devastating effects on our emotions and health. As such, there is an urgent need for studies testing interventions that can reduce both Instagram usage and the symptoms of social media addiction. One such potential intervention is Functional Imagery Training.

Functional Imagery Training (FIT) is an intervention that has proven effective in reducing food, smoking, drug and alcohol cravings (e.g., Andrade et al., 2016). Consisting of guided mental exercises, FIT helps individuals create vivid images for their long-term goals (Andrade et al., 2016), working on the tenet of Elaborated Intrusion Theory (EIT; Kavanagh et al., 2005) that vivid imagery is a more pleasurable and salient form of cognitive event (May et al., 2014; Andrade et al., 2016). Fostering goal imagery that is vivid makes individuals more likely to choose behaviours that are directed towards their goal, rather than unhealthy, short-term fixes that induce pleasure in the moment but are harmful in the long-term (May et al., 2004; Andrade et al., 2016). Whilst FIT has proved a successful treatment for a variety of cravings, it has not yet been tested on social media cravings. As mentioned in Andreasson's (2015) review, this may be due to the relatively recent acknowledgement in the field of psychology of addictive social media behaviour. However, as social media addiction displays the same symptoms as other addictions (Andreasson, 2015), including the experience of cravings (Ryan et al., 2014), we can assume that it will be reduced effectively by FIT, or FIT-like imagery exercises.

The present study aims to reduce Instagram cravings and usage via a novel online imagery (NOI) intervention which is based on the principles of FIT. We propose that a reduction in Instagram usage will cause an increase in participants' self-esteem,

supporting the findings of previous studies discussed above (e.g., Schmuck et al., 2019; Vogel et al., 2014; Wang et al., 2017). We have developed the NOI intervention in response to the national lockdowns imposed by the Coronavirus pandemic, as these restrictions mean we are unable to run in-person FIT. However, NOI intervention uses shortened forms of FIT imagery exercises as a basis, as well as goal-setting tasks. The main difference between the interventions is that NOI is presented entirely as text online, with participants reading through imagery exercises rather than being guided by another person. Instagram alone was chosen as the social media site to measure, due to its growing popularity, its focus on aesthetic images (Tyer, 2016) and its lack of psychological research compared to Facebook. To avoid recruiting participants who did not use Instagram frequently (as in Schmuck et al.'s 2019 study), we set eligibility requirements which stated that sign-ups to the study must a) have an Instagram account, and b) must have a desire to reduce their Instagram usage.

The study comprises three 15-minute sessions, each occurring one week apart (Week 1, Week 2 and Week 3). The design is stepped-wedge, with two conditions: Immediate and Delayed. This type of longitudinal design allows us to identify causal relationships between variables. Our hypotheses are as follows:

- **H1** = Participants' Instagram usage will decrease as a result of receiving a novel online imagery intervention.
- **H2** = Participants' Instagram cravings will decrease as a result of receiving novel online imagery intervention.
- **H3** = As participants' Instagram usage decreases, their self-esteem will increase.

Methodology

Participants and Design

Participants were undergraduate students studying Psychology at Plymouth University. We recruited 30 participants aged 18-41 years by advertising our study on the Plymouth University online Participation Points portal, called SONA. Participants received course credits in return for completion of the study (1.5 points in total, 0.5 points for each session of the study). However, before individuals could sign up for the study, our eligibility requirements stated that participants must use Instagram and must want to cut down on their usage. Due to some participants not completing all parts of the study, there were only 25 (21 female, 4 male) participants' data included in the final data analysis.

Overall, our study comprised of three sessions, each lasting roughly 15 minutes. Session 2 was conducted one week after Session 1, and Session 3 was conducted one week after Session 2. The study used a 'stepped-wedge' design, whereby half of participants received NOI in Session 1, the other half in Session 2. Therefore, the participants receiving NOI in Session 1 were the Immediate condition, the rest were the Delayed condition. In terms of assigning participants to each condition, we worked as follows: Both myself and my partner Naomi Cowdry created two study adverts each on SONA. If participants clicked on advert A they were assigned to the Immediate condition, if they clicked on advert B they were assigned to the Delayed condition. In the final data analysis, there were 13 participants in the Immediate condition and 12 in the Delayed condition.

Materials

Instagram Cravings:

We measured participants' cravings for Instagram by amending the Social Media Craving Scale (SMCS; Savci & Griffiths, 2019), swapping out the term "social media" for the term "Instagram". For example, "*In the past week, how often have you thought about using Instagram or about how good using Instagram would make you feel?*". This is a 5-item unidimensional scale, with possible answers on a scale of 0-7 (defined differently on each question). Each question measures a different aspect of cravings, all of which have been detailed as evidence of addictive behaviour (Andreasson, 2015; Ryan et al., 2014), and therefore are valid in the analysis of our H2 (Hypothesis 2).

Self-esteem:

We measured participants' self-esteem using the Rosenberg Self-Esteem Scale (RSeS; Rosenberg, 1965). This is a 10-item unidimensional scale, with answers using a 4-point Likert scale ranging from, 'strongly agree' to 'strongly disagree'. For example, "*At times I think I am no good at all*" and "*I feel I have a number of good qualities*". The RSeS is well-known and much-used, and has been assessed for reliability and validity.

Novel Online Imagery (NOI) intervention:

Our NOI intervention was developed using the imagery tasks included in Functional Imagery Training (FIT; Andrade, Khalil, Dickson, May & Kavanagh, 2016) as a basis. We adapted these sections of FIT to focus on Instagram use. The intervention was delivered online using sections of text (questions and imagery tasks) and answer boxes in a Qualtrics survey. An example from our imagery-intervention is as follows: "*Imagine yourself using Instagram...what you can see...hear...what you can touch...and how you feel about yourself. Now imagine your ideal self, where you are using Instagram less and noticing the improvements*" (see Appendix A for the full intervention).

Timeline Followback (TLFB) method:

The TLFB method (Sobell & Sobell, 1992) was originally developed to measure drug and alcohol use, utilising memory prompts to help individuals remember their substance use. Our study used the TLFB method to measure participants' Instagram usage for the previous three days, at four points in the day (before breakfast; between breakfast and lunch; between lunch and dinner; after dinner). Memory prompts included asking participants to "*remember what they had for breakfast/lunch/dinner yesterday*", which led on to questions about Instagram use, e.g., "*Can you remember if you used Instagram before breakfast/lunch/dinner?*" (see Appendix B for full TLFB method).

Participants were required to answer either, 'Yes' or 'No', to questions about Instagram use. During analysis, 'Yes' answers were scored as 1 point and 'No' answers were scored as 0 points, thereby giving us a result from 0-12 for each participant, for each week of the study. The TLFB method is highly reliable, both in person and online (Pedersen, Grow, Duncan, Neighbours & Larimer, 2012), having been adapted for use in multiple studies on cravings and behaviours (e.g., Andrade, Khalil, Dickson, May & Kavanagh, 2016; Valshtein, Oettingen & Gollwitzer, 2020).

Procedure

We recruited 30 eligible participants for our study and randomly assigned them to either the Immediate or Delayed NOI group. The study consisted of three sessions, each delivered one week apart and lasting roughly 15 minutes each. Participants were required to attend all three sessions of our study. As the study was delivered entirely online, participants accessed each weekly session via a link on SONA. This link took them to a Qualtrics survey corresponding to either the Delayed or Immediate condition.

In the first session, all participants were required to read through the brief and give their consent to beginning the study. They then completed the Social Media Craving Scale (SMCS; Savci & Griffiths, 2019), Rosenberg Self-esteem Scale (RSeS; Rosenberg, 1965) and Timeline Followback Method. The Immediate FIT group also completed the NOI intervention and were encouraged to use the imagery exercises in their daily life in the following week.

In the second session, delivered one week later, participants once again completed the SMCS (Savci & Griffiths, 2019), RSeS (Rosenberg, 1965) and Timeline Followback Method. The Delayed group also completed the NOI intervention and were encouraged to use the imagery exercises in the following week.

In the third and final session, participants completed the SMCS (Savci & Griffiths, 2019), RSeS (Rosenberg, 1965) and the Timeline Followback Method. The last page of the survey contained a 'thank-you' message for completing the study, with a Debrief section where researchers' names and email addresses were given, along with the dissertation supervisor's name and email address, in case participants wished to ask questions about the experiment.

Results

The dependent variable 'TLFB scores' has been renamed as 'Instagram Usage' in the following analyses and graphs. The dependent variable 'RSeS scores' has also been renamed as 'Self-Esteem scores' in the following analyses and graphs.

To assess whether Instagram Usage scores decreased across the study, a related samples t-test was conducted with Instagram Usage scores from the Immediate and Delayed conditions' respective pre- and post-imagery intervention weeks. Average scores for Instagram Usage were higher pre-imagery intervention than post-imagery intervention (.675 and .565 respectively), and results of the t-test showed that this was a significant change, albeit with a small size effect, $t(24) = 3.34$, $p = .003$, $d = 0.44$. Overall, these results indicate that participants from both conditions saw a decrease in their Instagram Usage (see Figure 1).

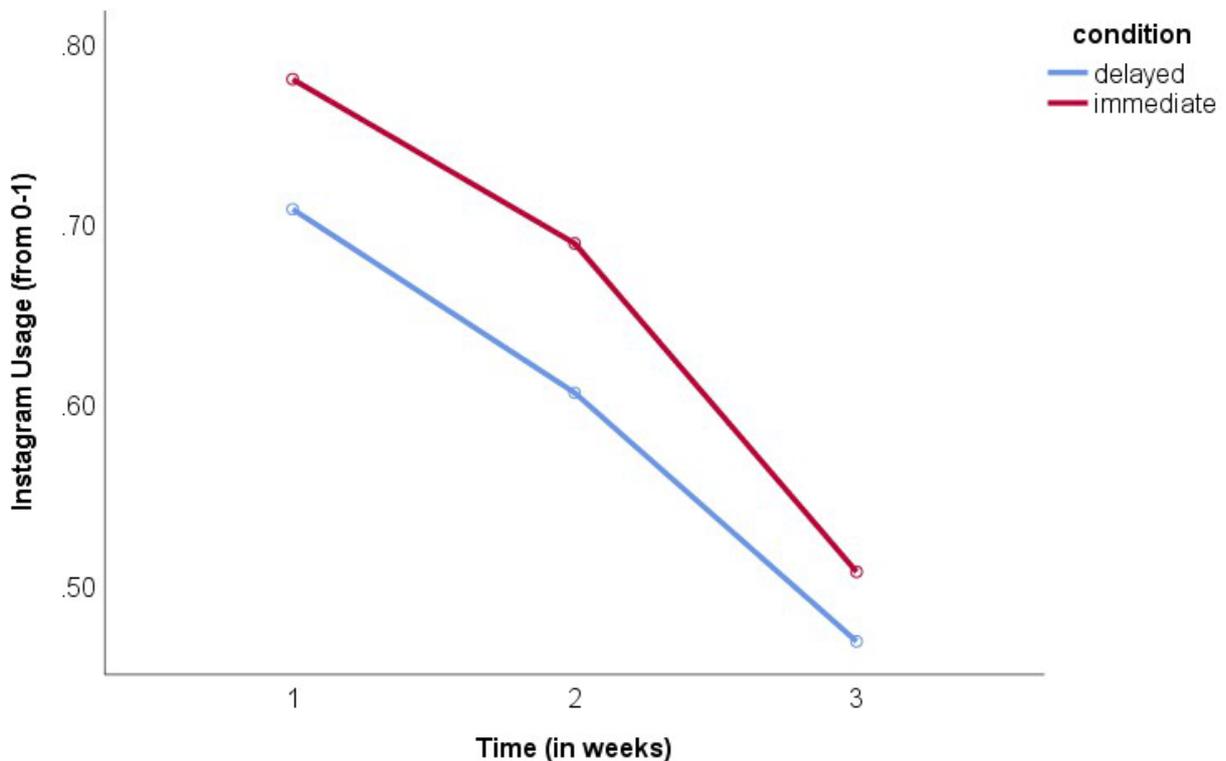


Figure 1: Line graph showing a significant decrease in Instagram Usage for both Immediate and Delayed conditions. Please note that participants in the Delayed condition began the study with lower existing Instagram Usage than the Immediate condition.

To test our H2 that Instagram Cravings decreased as a result of the NOI intervention, we first compared pre- and post-imagery intervention scores for the SMCS (2019) measures in both the Immediate and Delayed conditions. Results showed no significant differences for Thoughts About Using Instagram, $t(23) = 1.45$, $p = .162$, Strength of Craving, $t(23) = 1.60$, $p = .124$, Time Spent Thinking About Instagram, $t(24) = 1.00$, $p = .327$, and Overall Average Craving, $t(23) = 1.60$, $p = .124$. However, there was a significant difference in pre- and post-imagery intervention scores for the Difficulty to Resist measure, $t(24) = 3.17$, $p = .004$. Overall, these results indicate that Instagram Cravings were not reduced across the course of the study, and therefore our Hypothesis 2 remains unsupported. To assess whether Self-Esteem increased across the study, a related samples t-test was conducted using the average Self-Esteem scores for both the Immediate and Delayed conditions in their respective pre- and post-imagery intervention weeks. Results showed that Self-Esteem did increase slightly (2.81 post-imagery and 2.62 pre-imagery) but this was not a significant result. To provide a visual representation of this, a line-graph was produced (see Figure 2).

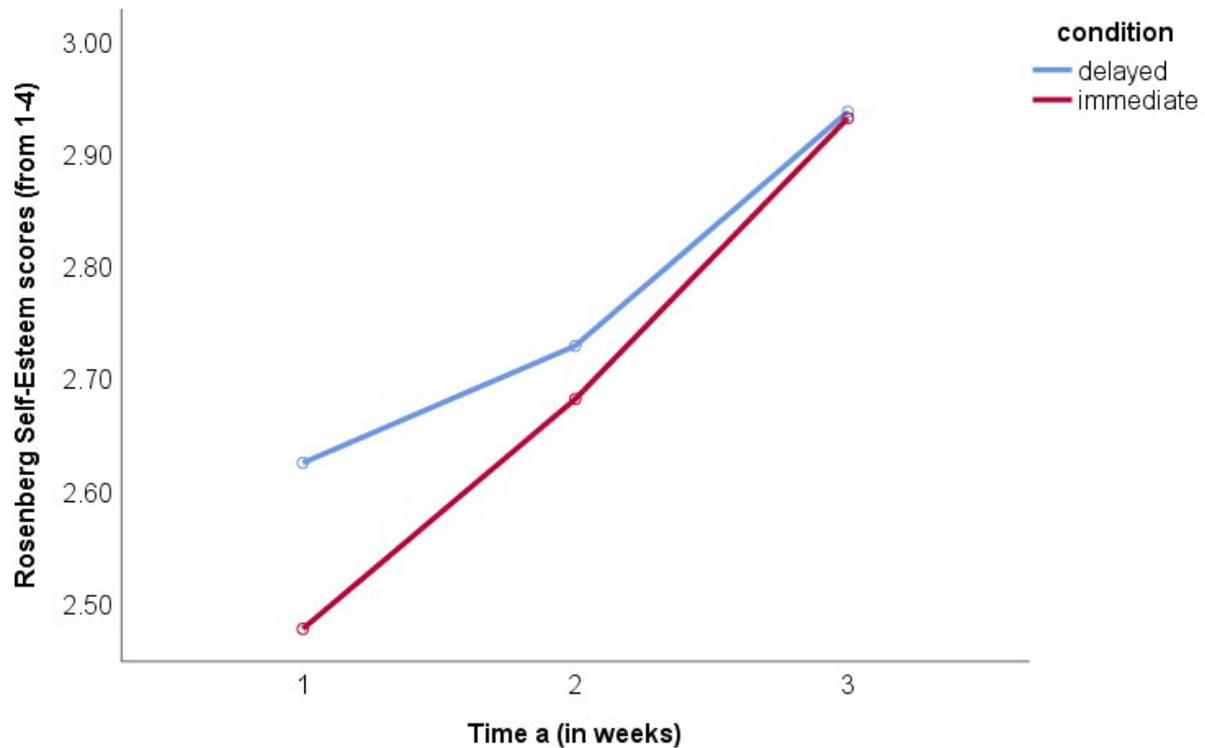


Figure 2: Line graph showing a slight increase in Self-Esteem for both the Delayed and Immediate conditions. Please note that participants in the Delayed condition began with higher existing Self-Esteem than the Immediate condition.

To test our H1 and H3, Instagram Usage and Self-Esteem scores were entered into a 2(condition) x 3(time) MANOVA. Results showed a significant relationship for Instagram Usage and Self-Esteem scores over time, $F(4,18) = 6.148, p = .002$, but no significant relationship between time and condition, $F(4,18) = .107, p = .978$. This indicates that the decrease in Instagram Usage occurred independently of our NOI intervention, rendering our H1 unsupported. To further explore the MANOVA results, Univariate tests were conducted which showed a significant change in both Instagram Usage, $F(2, 42) = 17.558, p < .001$, and Self-Esteem scores, $F(2,42) = 8.28, p = .001$, over time. However, a Bivariate Pearson correlation found no significant relationship (specifically, no significant negative correlation) between Instagram Usage and Self-Esteem scores at Week 1, $r(25) = -.094, p = .327$, Week 2, $r(25) = -.063, p = .383$ or Week 3, $r(23) = -.226, p = .149$, and though numbers indicate a negative correlation at points, our small sample size means we cannot accept this as a significant result. Therefore, our H3 remains unsupported.

Discussion

Results show that our NOI intervention was unsuccessful in reducing participants Instagram usage and Instagram cravings. Furthermore, Self-Esteem did not increase significantly as a result of a reduction in Instagram Usage. Whilst this might indicate that imagery interventions are not successful in reducing social media usage and cravings, there are multiple limitations within the present study that should be considered when drawing conclusions.

One limitation of the present study is the small sample size used. With so few participants in our study, we cannot make valid assumptions about the accuracy of our results. Therefore, if the study were replicated it would benefit from a larger sample size. Another limitation may lie in the way Instagram Usage was measured; for example, rather than measuring the frequency of Instagram use, it may have been more beneficial to measure length of time spent on Instagram. This would have given us a clearer indication of whether participants reduced the amount of time they spent on the social media site, or whether they simply checked their phone less. For example, participants may have checked Instagram less times throughout the day, but for a longer period each time. This would explain why our results showed a reduction in Instagram Usage scores, but no reduction in the measures of Instagram Craving or Time Spent using Instagram. In other words, participants may have replaced *frequency* of Instagram use for *duration* of Instagram use. Future studies should test participants on a variety of Instagram-use measures, perhaps utilising mobile apps to record time spent on social media, as well as using self-report questionnaires.

Another of the main limitations with the present study is the design of the NOI intervention. Whilst FIT provides a therapeutic style of intervention (with the presence of another person to guide the individual through imagery tasks, prompt them for goals, and ask questions; Andrade et al., 2016), our NOI had no personal element at all, consisting solely of text on a screen. Not only would this have stripped the imagery exercises of their client-counsellor-style relationship, it may also have made imagining visual scenarios very difficult, forcing participants to break their imagery state to check the time or the instructions of the exercise. Future online studies should use sensory material, such as embedded audio clips, to lend a more 'human' touch to the intervention. Researchers could also book Zoom sessions with participants in order to deliver NOI; although seemingly a time-consuming option, Zoom meetings would allow those individuals who cannot leave the house to engage fully with training.

A further limitation relates to the context surrounding sign-up for the study, and the motivation for participants to sign up. Having been forced to conduct all experiments online as a result of the pandemic, students and supervisors alike were faced with technical issues they were not accustomed to dealing with. The inability to hire rooms, or hand out paper consent forms and questionnaires, made studies harder to set up and organize. This led to a delay in the development of research projects, and a delay in the release of available studies onto the Plymouth University SONA system. By this time, Psychology undergraduates were desperate to gain enough credits to pass the year, making them more likely to sign up for all available studies, regardless of the purpose of the study, or the eligibility requirements. Therefore, they may have displayed demand characteristics in their answers to questionnaires, rather than answering truthfully. This may explain why the present study's Instagram Usage scores reduced from pre- to post-imagery intervention regardless of the NOI intervention; perhaps participants reported scores on the TLFB method which they thought would satisfy the purpose of our study. The same may be said for the increase in Self-Esteem scores over the course of the study; participants may have reported higher levels of self-esteem in the last session to confirm the purpose of our study.

However, the increase in Self-Esteem could have been due to the weekly 'checking in' on participants. Perhaps completing the Rosenberg Self-esteem scale (Rosenberg, 1965) every week drew participants' awareness to their level of self-esteem, motivating them to change their behaviour in order to improve this aspect of their psychological wellbeing. The same can be said for the Instagram Usage scores; perhaps completing a weekly TLFB method drew participants' attention to how frequently they used Instagram, motivating them to use the site less in general.

Our study has added to the literature on social media and self-esteem by testing an intervention designed to address Instagram cravings and usage. Whilst the intervention was not successful, and our results did not support our hypotheses, this study was the first of its kind in this area, and as such, should inspire other psychologists to measure ways in which online interventions can help reduce the frequency with which certain individuals use social media. Results on self-esteem contradicted previous studies (e.g., Schmuck et al., 2019; Vogel et al., 2014; Wang et al., 2017) by failing to find a significant negative correlation between frequency of social media use and self-esteem; however, it is possible that we failed to find this correlation because Instagram had benefits on participants' self-esteem. Studies mentioned briefly in the Introduction (e.g., Huang, 2016; Meier & Schafer, 2018) posit that social media has positive effects, for example, increasing sense of connectedness with others, promoting body positivity, and educating others on mental health issues. To explore this further, studies should investigate multiple social media sites, e.g., Youtube, Facebook, Snapchat and TikTok, as well as Instagram, to see whether certain sites are more damaging to self-esteem than others.

Conclusion

In conclusion, despite our failure to support our hypotheses, the present study has set a benchmark for future research on online interventions, in particular, imagery-based interventions. Whilst we cannot apply our findings to the real-world, it is important for society as a whole to understand the far-reaching benefits of high self-esteem. Whether or not self-esteem is negatively influenced by frequency of social media use may differ from person-to-person, but it is vital for individuals to become aware of the behaviours and habits that contribute to their own low self-esteem, so that they may find ways to reduce them. Importantly, this study was the first of its kind in this area, and as such, should inspire other psychologists to measure ways in which online interventions can help reduce the frequency with which certain individuals use social media.

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