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What is the impact of viewing social media style images in different contexts on body satisfaction and body size estimation?

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Highlights:

- Body-related may have a different effect when viewed on social media apps than elsewhere..
- Those who saw images in the app experienced changes in body satisfaction and size estimation.
- Changes to body image were related to overall social media use and underlying disordered eating.

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Abstract

Previous research indicates that viewing images of bodies on social media can have an adverse effect on how individuals feel about their own bodies. Prior research has presented stimuli in various contexts, with some studies employing a lab-based approach and others attempting to replicate the social media context. However, there has been little research that considers how seeing these images in different contexts might have different effects. Methodological issues, such as these, have been highlighted as limiting the conclusions we can draw about the impact of social media on various well-being measures, including disordered eating and body satisfaction. In this study, we recruited 230 female participants via a university participation platform and exposed them to social media-style images of bodies, either in the lab or on a social media profile that they viewed on their own device. We then measured body satisfaction and body size judgments before and after this exposure. Results indicate that seeing images in a social media context, specifically in the Instagram app, seems to have a different impact than seeing the same images in a lab setting, such that in a lab setting there were no changes to body satisfaction or size estimation, but when using the smartphone app participants experienced changes in these measures. We also note that the effect of seeing these images is related to individual social media use and underlying disordered eating thoughts and behaviours. Future research should consider in more depth the characteristics of social media platforms that might exacerbate negative effects of seeing content in these contexts.

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1. Introduction

Social media is among the most popular ways to spend time online, with roughly 70% of internet users in the UK engaging with social media platforms (ONS, 2020). Instagram is especially popular, reporting one billion users in 2018—a number that has likely increased since then (Instagram, 2018). As a photo-based sharing platform, Instagram is particularly relevant when examining the influence of social media on our perceptions of our bodies. Recent reviews have noted that certain types of content, such as fitspiration images, can have particularly harmful effects on body satisfaction and related disordered eating behaviors (Vandenbosch et al., 2022; Powell & Pring, 2024; Ladwig et al., 2024). However, earlier research in this area has been limited by a lack of ecological validity, especially regarding how stimuli are presented within the platform, a common issue in social media research (Orben, 2020). Eating disorders are serious and potentially life-threatening mental health conditions, including anorexia nervosa, bulimia nervosa, binge eating disorder, and others, characterized by a range of symptoms such as disrupted eating patterns (restriction or bingeing), preoccupation with weight or shape, engagement in compensatory behaviors (excessive exercise, purging), and more (APA, 2013). Research shows that 'sub-clinical' disordered eating is highly prevalent across various communities (Carey et al., 2019). Although disordered eating may not meet the criteria for a formal diagnosis, it can significantly impact an individual's well-being and quality of life. We use the term disordered eating to encompass these experiences, acknowledging that it is not possible to determine whether a participant meets the criteria for an eating disorder diagnosis.

Fitspiration aims to motivate followers to adopt a healthier lifestyle through good eating habits and exercise (Tiggemann & Zaccardo, 2015). It can be found by searching hashtags like #fitspiration or #fitspo, or it can appear unintentionally in a user's feed. Content analysis of what is labeled as "fitspiration" reveals that there is a predominantly one type of body displayed – one that is thin and toned (Tiggemann & Zaccardo, 2015; Nuss et al., 2024; Pryde et al., 2024). The idea that other users on Instagram are peers may lead to appearance and health-related social comparisons, which, along with easy access, could make fitspiration content especially influential on a user's body satisfaction. This content implicitly suggests that only one type of body can be healthy and attractive. Following 'health and fitness' accounts that post fitspiration on Instagram is linked to higher internalization of the thin ideal, a stronger drive for thinness, and disordered eating behaviors (Cohen et al., 2017; Xu, 2024). Much of fitspiration content consists of selfies—photos individuals take of themselves (Diefenbach & Christoforakus, 2017). Some research suggests that selfie activities, rather than general social media use, are more closely linked to body image and eating concerns (Cohen, Newton-John, & Slater, 2017). Regularly viewing selfies has also been linked to lower life satisfaction and self-esteem (Wang, Yang, & Haigh, 2017). Despite selfies being common on social media, little research has examined how viewing these images might affect body satisfaction. Selfies are unique because of the visual angle from which they are taken. The angle from which a body is viewed influences aesthetic judgments. For example, large bodies are rated as significantly less attractive from an allocentric (observer) perspective compared to an egocentric perspective (viewed as if from the eyes in the head), and bodies from an allocentric perspective are judged as weighing more than from an egocentric view, especially for larger bodies (Carey et al., 2019). Selfies are often perceived as slimmer than images of bodies taken from other angles, and differences in perceived attractiveness between perspectives relate to eating disorder vulnerability. Those who are more vulnerable tend to rate selfies as more attractive, which could put them at higher risk of negative effects on body satisfaction, particularly from selfies (Knight & Preston, 2023). Since taking and viewing selfies has been shown to negatively impact body image and self-esteem (Veldhuis, Alleva, de Vaate, Keijer, & Konijn, 2020), and selfies tend to portray bodies in a slimmer light than those seen from other angles, selfies may be especially influential on the body satisfaction of viewers.

Although a body of research highlights how fitspiration can affect our thoughts and feelings about our bodies, there has been no research to date examining whether this kind of content also influences our perception of body size. Body size estimation differs in women with eating disorders compared to women without them, as they are often found to perceive their bodies as larger than they actually are (Keizer et al., 2013; Stice, 2002; Stice & Shaw, 2002). Perception of body size is linked both behaviorally and neurologically to how we feel about our bodies (Preston & Ehrsson, 2014, 2016, 2018). Therefore, it is essential to investigate whether social media negatively impacts body size perception in the same way it affects body satisfaction, a topic that has not yet been thoroughly examined in research.

Many body size estimation tasks that aim to tap into perceptual experiences of the body may actually be more related to attitudes toward the body (Cornelissen, Johns & Tovée, 2013). The door aperture task might avoid this (Keizer et al., 2013; Guardia et al., 2010). In this more implicit task, participants view door apertures

projected on a screen in front of them and must decide whether they can pass through the door without turning their shoulders (Guardia et al., 2010). Participants with anorexia turn their bodies for apertures 40% wider than their own shoulders (both in terms of judgments and actual actions), whereas healthy participants only start turning their bodies for doors that are 25% wider than their own shoulders (Guardia et al., 2010; Keizer et al., 2013). This suggests that body size perception, as well as body satisfaction, differs for people with an eating disorder. Based on this, it appears that individuals who are more vulnerable to an eating disorder and, therefore, more susceptible to negative body attitudes from social media, may also exhibit related changes in body size perception.

There are many potential barriers to accurately understanding how social media influences our thoughts and feelings about our bodies; social media platforms are constantly changing, and each person's feed is unique to them. Furthermore, how we use social media, such as messaging versus viewing images, likely affects its impact on us (Engeln et al., 2020). It is challenging to study these experiences in a way that accurately reflects real life, as controlling certain variables in experiments alters the actual social media experience. For this reason, previous research in this area has been criticized for lacking sufficient control or ecological validity to be meaningful (Orben, 2020). For example, a prior study by Fardouly et al. (2015) asked participants to browse their own Facebook accounts. However, this browsing was done via desktop in a laboratory setting, which may not accurately replicate the typical experience of using a smartphone. Different platforms also tend to deliver different types of content, which can influence results. Instagram, being an image-based platform, is also associated with more exposure to body-related content than Facebook (Engeln et al., 2020). The authors of the above paper suggest that future research should focus on maintaining naturalistic viewing and ecological validity. However, in doing so, they did not control or monitor the specific elements of Facebook or the types of posts participants viewed during their 10-minute browsing session (e.g., pictures of friends, status updates).

To build on previous findings, we specifically control which images participants are exposed to in a lab setting (Experiment 1) and maintain a more naturalistic social media viewing experience by allowing participants to use their own devices (Experiment 2). By regulating the type of posts viewed, we aim to examine whether participants experience changes in body satisfaction and related shifts in body size perception after viewing fitspiration images from different visual viewpoints (allocentric, egocentric, and selfies). Including both lab-based and real-world settings helps us understand the importance of considering context when viewing social media images. We also evaluate vulnerability to disordered eating thoughts and experiences to determine if those with such experiences are at higher risk when exposed to this type of content.

When trying to understand the potential impact of various factors, including social media use, on eating vulnerability, it is crucial to ensure that the correct construct is being measured. Many of the measures used in both clinical and community samples have been questioned for their psychometric properties. This is particularly important because the broadened criteria for eating disorders introduced in DSM-5 (American Psychiatric Association, 2013) suggest that assessments should not be based solely on symptoms related to anorexia and bulimia nervosa (Carey et al., 2019). Therefore, we used a recently validated factor structure (Carey et al., 2019) of the “Eating Disorder Examination Questionnaire” to assess Eating Disorder vulnerability. Based on the findings related to traditional and social media mentioned above, it is hypothesized that body satisfaction will decrease in both a lab-based and more ecologically valid setting after viewing fitspiration-style images. Furthermore, because selfies are perceived as slimmer than images from other perspectives, it is anticipated that reductions in body satisfaction will be greater in participants who view selfie (and selfie-stick) images compared to those who view allocentric and egocentric images. It is also hypothesized that viewing fit-spiration-style images will influence body size perception such that, after viewing the images, participants will judge the smallest door aperture they can fit through to be larger compared to before viewing, and that this effect will be more pronounced after viewing selfies. Finally, it is hypothesized that participants who spend more time on social media in general will have lower baseline body satisfaction, experience greater decreases in body satisfaction after viewing the images, and have more disordered eating thoughts and behaviors.

2. Method

Participants

Based on the small effect sizes found in previous meta-analyses, a power analysis was conducted using R (pwr package) for general linear model analysis with three groups. This indicated that a minimum of 96 participants was needed to be sufficiently powered (power = .08, alpha = .05, f = .1). Ninety-six female participants aged 18 to 26 took part in the experiment; further demographic information can be found in Table

1. Participants were recruited through an online system allowing students on undergraduate Psychology courses to gain course credit for taking part in experiments.

Table 1. A table showing demographic information for both experiments.

	N	Gender	Race	Age	EDE-Q SWC	EDE-Q PEC	EDE-Q Restriction
Experiment 1	96	Female (100%)	87 White 3 Asian 6 Mixed Race	20.14 (1.48)	2.49 (1.60)	0.64 (0.97)	1.86 (1.70)
Experiment 2	134	Female (100%)	121 White 1 Hispanic 2 Black 6 Asian 4 Mixed Race	19.30 (2.42)	2.67 (1.67)	1.02 (1.14)	1.86 (1.55)

Participants provided informed consent through an information and consent form delivered via the Qualtrics platform. Full details of confidentiality, the right to withdraw data, and how to do so were included in both this and the debrief sheet, which was received via Qualtrics (experiment two) or in person (experiment one). In the information sheet, participants were provided with information about the purpose of the study, indicating that the way social media influences one's experiences of the body was being explored, but not with precise details about the specific factors being examined. Ethical approval was obtained from the departmental ethics committee for this project.

Equipment

An iMac computer and projector were used to project door apertures onto a large blue screen, positioned approximately 200cm away from the projector. Participants stood approximately 150cm away from the screen. Participants used a wireless keyboard to respond to the question of whether they felt they could walk through the door without turning their shoulders. Questionnaires (demographic information and Eating Disorder Examination Questionnaire 6.0) were presented via Qualtrics on the iMac computer. Images of female bodies, taken from either an allocentric, egocentric, or selfie perspective, were randomly displayed on the computer on a programme coded with Python in Psychopy (Peirce et al., 2019).

Stimuli

Images of female bodies from the shoulders down were captured from three different perspectives (egocentric, allocentric, and selfie) against a white background. The women in the photos wore gym-appropriate clothing, such as leggings and a tight-fitting vest or T-shirt. The same eight models appeared in each perspective—one model took the allocentric photo, while the egocentric and selfie photos were taken by the models themselves. Six of these models were included in the experiment due to variations in body size; since fitspiration images mainly feature slim bodies and two of the photo sets were outliers based on BMI, their images were excluded. Research shows that exposure to images of different body sizes impacts disordered eating thoughts and behaviors differently than exposure to a narrower range of body sizes (Cohen et al., 2021). Because our focus was specifically on fitspiration-style content, we only used the six image groups that fit these criteria. The stimuli were a subset from a previous study (Knight & Preston, 2023).

Measures

Eating Disorder Examination Questionnaire 6.0 (EDE-Q)

The EDE-Q is a 28-item self-report questionnaire that assesses eating disorder symptoms (Fairburn & Beglin, 1994; 2008). It assesses disordered eating behaviors and attitudes over the last 28 days and has traditionally used four subscales (Restraint, Eating Concern, Shape Concern, and Weight Concern) as well as a global score, which is calculated from the mean of the four subscale scores. However, previous studies found a three-factor model using 14 items showed the best fit, with factors consisting of Shape and Weight Concern (SWC), Preoccupation and Eating Concern (PEC), and Restriction (Carey et al., 2019). We used this three-factor structure. Participants rate items on a 7-point Likert scale, with higher scores indicating higher eating disorder psychopathology. Six items relate to the frequency of eating disorder attitudes and behaviours in the past 28 days, which do not contribute to the subscale or global scores but provide information on some core eating

disorder behaviours such as laxative use and self-induced vomiting. These were omitted from this study. Research has established acceptable levels of internal consistency for global and subscale scores in men and women, alongside the reliability of this version of the scale (Carey et al., 2019; Knight et al., 2023; Knight & Preston, 2023).

Design

We employed a between-subjects design, with participants allocated to one of four conditions to ensure an even distribution of EDE-Q scores, based on the visual angle of the images (i.e., egocentric, allocentric, selfie, and selfie-stick). See allocation details below.

Procedure

Between 72 and 24 hours before coming to the lab for the experiment, participants received a personalized link to a questionnaire on Qualtrics that included demographic information and the EDE-Q. The results were used to assign each participant to one of three conditions (allocentric, egocentric, and selfie) to ensure a balanced distribution of EDE-Q scores across groups. In the lab, participants first completed a state body satisfaction measure using a visual analogue scale (VAS) anchored by 'Very Dissatisfied' and 'Very Satisfied'. They then performed the door aperture task, where they viewed 51 door openings ranging from 30 cm to 80 cm in width, increasing in 1 cm steps, projected in front of them (Guardia et al., 2010). Using a keyboard, they responded whether they could walk through the door at a normal pace without turning their shoulders. The experiment was programmed in PsychoPy. Afterwards, participants viewed six body images from a perspective assigned to their condition (egocentric, allocentric, or selfie) and completed a 1-back task to maintain focus, pressing the spacebar if they saw the same image twice in a row—this occurred at least twice per participant. The images were randomized within each condition, each shown for 2 seconds, and repeated six times. Then, participants completed post-manipulation measures of body satisfaction (VAS) and body size judgments (the door aperture task). At the end, the experimenter measured each participant's shoulder width with a tape measure, along with their height. Participants also recorded their own weight using a set of scales.

Data Analysis

Body satisfaction scores before and after viewing images were calculated using the VAS, and critical apertures for both conditions were determined by finding the aperture corresponding to a 50% positive 'yes' response (Guardia et al., 2010). This was done for each trial for each participant. EDE-Q scores were computed by averaging the relevant items for each participant. All data were normally distributed. A MANOVA was employed to identify potential differences in EDE-Q scores between conditions. To directly test the hypotheses that body satisfaction decreases after viewing fitspiration images and that selfies have the biggest impact, we conducted a 2x3 mixed ANOVA on body satisfaction scores with the within-subject factor of time (pre and post) and the between-subject factor of condition (egocentric, allocentric, and selfie-stick). Similarly, to test whether viewing fitspiration images influences body size perception and if selfies exert the largest effect, we performed a 2x3 mixed ANOVA on critical aperture in the door aperture task with the within-subject factor of time (pre and post) and the between-subject factor of condition (egocentric, allocentric, and selfie-stick). Based on previous research indicating that shape and weight concerns may underlie differences in judgments across social media content from different perspectives (Knight & Preston, 2023), we also explored these models with levels of shape and weight concern controlled for (mixed ANCOVA). Reliability values for the EDE-Q were both more than acceptable: $\omega = 0.954$, $\alpha = 0.948$. All statistical analyses were conducted in Jamovi (The Jamovi Project, 2025).

3. Results-Experiment One

To directly test the hypothesis that viewing social media style images will influence body size estimations, and that selfies will have the largest effect, a mixed 2x3 ANOVA was run in order to establish whether there was an effect of exposure to stimuli or stimuli type (selfie, allocentric, or egocentric) on critical aperture. There was no significant effect of exposure to stimuli on critical aperture ($F_{(1, 91)} = 1.32$, $p = .254$, $\eta 2 = 0.002$). When controlling for SWC, there was also no significant effect of exposure to stimuli on critical aperture ($F_{(1, 91)} = 13.07$, $p = .425$, $\eta 2 = 0.000$). There was also no significant effect of stimulus type on critical aperture ($F_{(2, 91)} = 0.07$, $p = .936$, $\eta 2 = 0.001$).

To directly test the hypothesis that viewing social media-style images affects body satisfaction, and that selfies have the greatest effect, a second mixed 2x3 ANOVA was conducted to determine whether exposure to

stimuli or stimulus type has an impact on body satisfaction. There was no significant effect of viewing the stimuli on body satisfaction ($F_{(1, 90)} = 0.25$, $p = .618$, $\eta 2 = 0.000$). There was also no effect of exposure to the stimuli on body satisfaction when controlling for SWC ($F_{(1, 90)} = 0.80$, $p = .373$, $\eta 2 = 0.000$). There was no significant effect of stimuli type on body satisfaction ($F(2, 90) = 1.51$, $p = .227$, $\eta 2 = 0.032$).

Discussion – Experiment One

There was no significant effect of viewing social media style images on measures of body size estimation or body satisfaction. The angle that the images had been taken from also did not elicit a significant effect on body size estimation or satisfaction. No differences in body size estimation or satisfaction were found when individual levels of shape and weight concern were controlled for. None of the hypothesized effects were found in experiment one.

Previous research indicates that differences in aesthetic judgements of social media style images from various perspectives may be driven by differences in shape and weight concern (Knight & Preston., 2023). Based on this, we controlled for shape and weight concern when exploring the effects of exposure to stimuli on body satisfaction and size estimation. Even when shape and weight concern was controlled for, there were no differences in body satisfaction and size estimation following viewing these images. This may indicate that transient exposure to social media style stimuli is not sufficient to elicit changes in body satisfaction and body size estimation. It may be that only more consistent, long-term viewing of this kind of content affects how we feel about our bodies.

Some previous studies have found significant increases in body dissatisfaction after viewing social media images in a laboratory setting (Tiggemann & Zaccardo., 2015) however we did not replicate this finding in experiment one. Results in the aforementioned study were found to be mediated by state appearance comparison; it may be that our sample in experiment one did not have high levels of appearance comparison, something that we did not measure. Furthermore, in the 2015 study images were presented on an iPad and no attention task was used, unlike in our experiment in which images were presented on a desktop and participants were asked to engage in an attention task. These manipulations may have influenced results with the previous task (Tiggemann & Zaccardo., 2015) potentially reflecting a more naturalistic social media-type viewing context.

However, much of the previous literature exploring the effect of viewing social media style content on body satisfaction has exposed participants to this stimuli within lab conditions, with the images being presented on a computer in various ways (e.g., Robinson et al., 2017; Tiggemann & Zaccardo., 2015). However, social media platforms themselves have unique features that cannot be captured by presenting participants with these images outside of the platform's overall context. This may include, for example, comments and likes that are visible by other users, or other contextual cues such as one's own profile. It may be that the context that images are seen in also influences how participants feel about their body. In order to examine this more closely, in experiment two we will present fitspiration style images on the Instagram application itself. To achieve this, participants will complete the experiment on their own smartphones. Although body satisfaction can be measured in the same way in experiment two, using a VAS scale, participants will not be able to complete the door aperture task in their home environment. Therefore, to assess changes in body size estimation, the Photographic Figure Rating Scale (PFRS) will be used (Swami, Salem, Furnham & Tovee, 2008).

Methods - Experiment Two

Participants

Based on the small effect sizes found in previous meta-analyses, a power analysis was conducted using R (pwr package) for general linear model analysis with four groups. This indicated that a minimum of 112 participants were needed to be sufficiently powered (power = .08, alpha = .05, f = .1). One hundred and thirty-four female participants aged 18 to 35 took part in the experiment, further demographic information can be found in Table 1. All participants were recruited through an online system allowing students on undergraduate Psychology courses to gain course credit for taking part in experiments.

Equipment

Participants accessed the questionnaire via a Qualtrics link on their smartphones and used the Instagram app to view the images.

Stimuli

The same stimuli were used for this experiment as in the first experiment, as described above, however in this experiment we also included an extra set of selfie images, taken with a selfie-stick. These were included in order to more accurately capture the kind of fitspiration content commonly seen in the Instagram app at the time as well as being taken at a similar distance from the body as the allocentric condition. The extra condition was not included in the first experiment due to time constraints for an in-person experiment.

Measures

The EDE-Q was used in experiment two, as described above.

The Photographic Figure Ratings Scale was used as a measure of body size estimation. This body image assessment scale was developed to improve on typically used line-drawn scales by overcoming issues of realism and poor ecological validity (Swami et al., 2008). Research indicates that the instrument demonstrates acceptable levels of reliability and validity (Swami et al., 2008; Swami et al., 2012). Participants are presented with a series of ten standardized photos of women's bodies, which range from the BMI category 'emaciated' to the BMI category 'obese'. They are asked to select the image that they feel best matches their own body.

Weekly social media use was also collected by asking participants to report their average weekday social media use in hours and their average weekend day social media use in hours. There are some issues with self-report measures of social media use, so we attempted to account for differences between weekends and weekdays to obtain a weekly measure (Verbeij et al., 2021).

Procedure

Participants followed the link to the questionnaire via social media or an online participant recruitment platform. They were presented with the study information and consent sheet before completing the initial measures of body satisfaction. This consisted of a visual analogue scale (VAS) asking them how satisfied they were with their body at that moment: 'How satisfied are you with your body right now?'. The VAS was anchored by 'Very Dissatisfied' and 'Very Satisfied', as in Experiment One. Body perception was measured using the Photographic Figure Ratings Scale, replacing the door aperture task, which could not be completed outside the lab environment. Then participants were directed to one of four Instagram profiles (depending on which condition they had been allocated to), which contained the stimulus photos from one condition (selfie, selfie-stick, allocentric, and egocentric). They were instructed to browse and engage with these profiles for five minutes. We instructed participants to view only the linked profile, to control the type of content being observed; however, it is not possible to confirm whether they followed these instructions. Whether participants clicked on the link and the time spent away from the Qualtrics survey was recorded. Those who did not click on the link or spent less than the mandated five minutes on the platform (measured by the time taken to progress to the next question, which was recorded via Qualtrics) were excluded. The body satisfaction and size perception tasks were then repeated. Finally, participants completed the EDE-Q and recorded their height and weight. At the end of the questionnaire, participants were presented with a debrief sheet that provided details of the study's purpose and signposts to sources of further support and information.

Data Analysis

Body satisfaction scores for before and after viewing images were calculated from the VAS and body size estimation scores from the Photographic Figure Ratings Scale. EDE-Q scores were calculated for each participant by taking the mean of the relevant items for each subscale. All data were normally distributed. A MANOVA was used to identify potential differences in EDE-Q scores between conditions. To directly test the hypotheses that body satisfaction will decrease following viewing fitspiration images and that selfies will have the biggest effect, we conducted 2x4 mixed ANOVA for body satisfaction scores with the within factor of time (pre and post) and between factor of condition (egocentric, allocentric, selfie, and selfie-stick). In order to directly test the hypotheses that viewing fitspiration images will impact body size perception and that selfies will have the biggest effect, we conducted a 2x4 ANOVA for body figure rating scale with the within factor of time (pre and post) and between factor of condition (egocentric, allocentric, selfie, selfie-stick.) Reliability statistics for the EDE-Q were both more than acceptable: $\omega = 0.951$, $\alpha = 0.947$. All statistical analysis was carried out in Jamovi (The Jamovi Project, 2025).

To test the hypotheses that those who spend more time on social media will have lower body satisfaction, a greater negative affect of viewing the images, and higher eating disorder thoughts and behaviours, we combined data from experiments one and two to increase power. Pearson's correlation coefficient was used to examine relationships between reported weekly social media and baseline body satisfaction (body satisfaction

measure before viewing the stimuli), change in body satisfaction (the difference between pre- and post-body satisfaction scores), and EDE-Q scores. The change in body satisfaction scores was calculated by subtracting the pre-exposure body satisfaction scores from the post-exposure scores, such that negative scores represented decreases in body satisfaction and positive scores represented increases in body satisfaction.

In Experiment 1, participants were allocated to a condition based on their EDE-Q scores, ensuring an equal spread of scores across conditions. Given the non-significant results in Experiment 1, as well as the ethical and logistical considerations of group allocation for an online study, we did not follow this procedure in Experiment 2.

Results – Experiment Two

To directly test the hypothesis that viewing social media images affects body size perception, with selfies having the greatest impact, a mixed 2x4 ANOVA was conducted to determine whether stimulus exposure or stimulus type (selfie, selfie-stick, allocentric, or egocentric) influences FGRS. A significant difference in FGRS was observed from pre-exposure (M = 4.43, SD = 1.64) to post-exposure (M = 4.63, SD = 1.69) to stimuli ($F_{(1, 128)}$ = 4.66, p = .033, η2 = 0.001), as shown in Figure 1. Controlling for SWC, however, there was no significant effect of stimulus exposure on FGRS ($F_{(1,128)}$ = 2.69, p = 103, η2 = 0.000). Additionally, stimulus type did not significantly affect FGRS ($F_{(3, 128)}$ = 0.09, p = .967, η2 = 0.001).

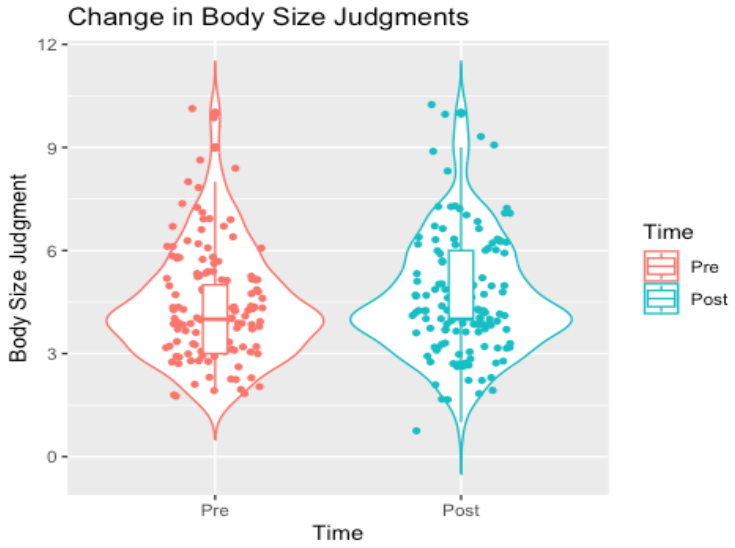

Figure 1. Showing the significant change in body size judgement from pre to post exposure to stimuli.

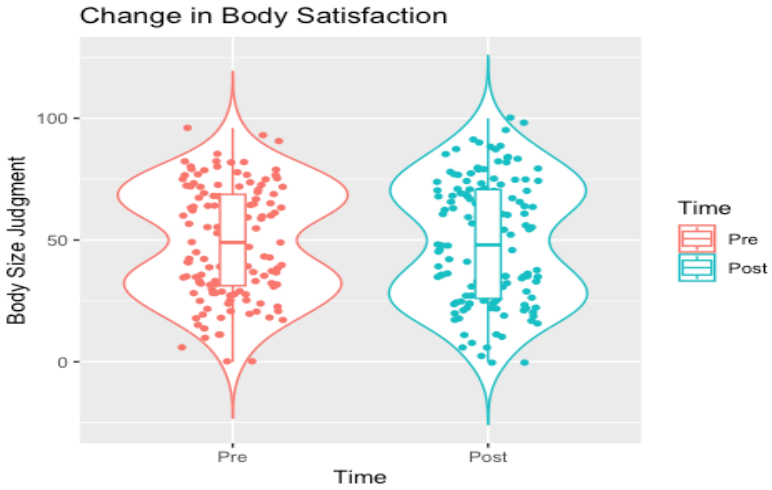

Figure 2. Showing the significant change in body satisfaction from pre-to-post exposure to stimuli.

To directly test the hypothesis that viewing social media images influences body satisfaction, and that selfies have the greatest effect, a mixed 2x4 ANOVA was conducted to determine whether exposure to stimuli or the type of stimuli (selfie, selfie-stick, allocentric, or egocentric) affects body satisfaction. There was a significant difference in body satisfaction from pre-exposure to stimuli (M = 49.35, SD = 22.93) to post-exposure (M = 49.32, SD = 25.49) ($F_{(1, 129)}$ = 9.14, p = .003, η2 = 0.002), as shown in Figure 2. There was also a significant effect of exposure to stimuli on body satisfaction when controlling for SWC ($F_{(1, 129)}$ = 13.11, p < .001, η2 = 0.002). There was no significant effect of condition on body satisfaction ($F_{(3, 129)}$ = 0.32, p = .808, η2 = 0.002).

Social Media Use (Collapsed Over Experiments One and Two)

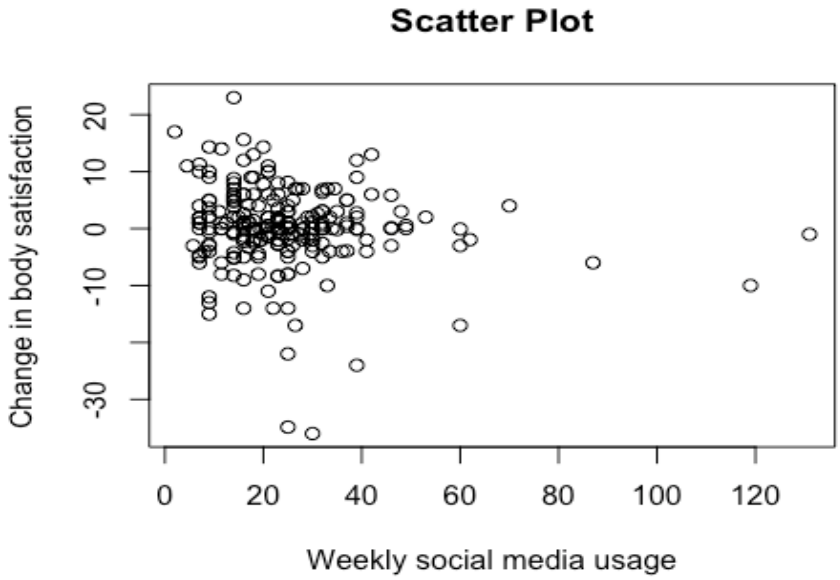

Figure 3. Showing the significant weak correlation between weekly social media use and change in body satisfaction.

As was hypothesized, Pearson's correlations revealed a significant weak negative correlation between weekly social media use and baseline (pre) body satisfaction scores, such that higher weekly social media use was related to lower body satisfaction scores (r = -0.14, p = .038). There was also a significant weak negative correlation, as hypothesized, between weekly social media use and change in body satisfaction, such that higher social media use was linked to greater decreases in body satisfaction after viewing the images (r = -0.14, p = .041), as shown in Figure 3. Finally, weekly social media use was significantly positively correlated with EDE-Q scores, such that as weekly social media use increased, so did EDE-Q scores. This was the case for Restriction (r = 0.16, p = .018), Shape and Weight Concern (r = 0.21, p = .001), and Preoccupation and Eating Concern (r = 0.16, p = .013) subscales. All these relationships represent small effects.

Experiment Two Discussion

As hypothesized, there was a significant increase in FGRS, a measure of body size perception, after viewing the stimuli, as evidenced by the rise in this score following image exposure. However, when controlling for shape and weight concerns, this difference was no longer significant. Body satisfaction scores also decreased significantly after viewing the stimuli, even when accounting for concerns about shape and weight. There was no significant effect of stimulus type on either measure.

Controlling for SWC did not affect the observed decrease in body satisfaction after exposure to the stimuli; however, controlling for this factor did remove the change in PFRS. This may relate to the different aspects of body satisfaction and size estimation experiences we are examining. The PFRS was used to measure body size perception, and SWC may influence how a person judges their body size. In fact, previous research shows that people with anorexia nervosa are poor at assessing their body size (Keizer, 2013) and tend to have more unstable body size estimates (Espeset et al., 2012). These findings could help explain why this occurs; perhaps concerns about shape and weight affect the accuracy of body size estimation, with more negative feelings about our body dimensions linked to greater perceptual instability. More research is needed to clarify this. The fact

that controlling for SWC did not prevent the decrease in body satisfaction suggests that SWC alone does not cause social media-related changes in body satisfaction. Body satisfaction is a complex, multifaceted phenomenon, and many other factors likely influence this in the context of social media. These factors may include the tendency to make social or appearance-based comparisons, other disordered eating thoughts and behaviors (e.g., preoccupation and eating concerns), or factors related to overall social media use or even temporary mood states. These areas were outside the scope of the current study, and further research is necessary to explore them more fully.

Interestingly, these results suggest that viewing images within the app may have a slightly different effect compared to viewing the same images in a laboratory setting. The context in which an image is viewed may include social cues that influence body satisfaction and perception. Alternatively, priming effects from previous experiences in environments like Instagram could play a role. In the future, researchers might want to explore more specifically what features of the app context—such as likes and comments—contribute to this effect.

4. General Discussion

This study investigated the impact of viewing social media content (via Instagram and in the lab) on participants' body satisfaction and body size estimation, as well as the relationship between time spent on social media and these perceptions. We found no significant impact of viewing fitspiration content in the lab regarding body satisfaction and size estimation. However, when participants viewed the same images on their own smartphones using the Instagram app, their body satisfaction decreased significantly, and their body size estimates increased significantly. Nonetheless, the difference in size estimates was no longer significant after controlling for shape and weight concerns. Contrary to expectations, the angle from which a photo was taken did not influence body satisfaction or size estimation in either experiment. Combining results from both experiments, we observed that participants who spent more time on social media each week reported lower initial body satisfaction and experienced larger decreases after viewing the stimuli. Additionally, those who spent more time on social media scored higher on measures of disordered eating thoughts and behaviors.

In both experiments one and two, there was no significant effect of the visual perspective from which images were taken on any outcome measures. This was somewhat surprising, given previous research suggesting that the visual angle from which images are taken influences aesthetic judgments of bodies and may involve different levels of self-referential processing, thereby more readily implicating the self (Knight & Preston, 2023). It is possible that this finding might be explained by the objectification inherent in social media-style images, which could reduce the extent to which viewing these images involves the self, making all types of bodies equally impactful on body satisfaction. However, it is also possible that, because the observed effects were not large and may disproportionately affect individuals who spend more time on social media and are already vulnerable to eating disorders (as suggested by our correlation results), we may not have had sufficient power to detect such effects. Future studies might consider specifically recruiting participants with low body satisfaction or those who are intensive social media users.

In experiment one, the lab-based study, there was no significant change in body satisfaction after viewing fitspiration images, and the perspective from which the bodies were viewed did not affect body satisfaction scores. However, there was an effect of viewing the same images on the Instagram app in experiment two. This suggests that short exposure to fitspiration content does not cause significant changes in body satisfaction in laboratory conditions but does in more ecologically valid settings, such as on the Instagram app on participants' own smartphones. Social comparison theory, which indicates that we compare ourselves to others as a form of self-exploration, suggests that media and social media may be especially ripe for comparisons, since we perceive other users as peers (McComb et al., 2023). Making upward social comparisons might be inspiring in the short term but harmful to well-being over the long term (Meier & Johnson, 2022). It may be that the context in which we view images, rather than the images themselves, plays a key role in any social comparisons we make. The environment of the Instagram app may be particularly conducive to upward social comparisons, potentially leading to decreases in body satisfaction. Our previous study, which found differences in slimness judgments based on the viewing angle of these same images in a laboratory setting, measured this in a laboratory environment (Knight & Preston, 2023). It would be valuable to determine whether viewing the same images in a more ecologically valid environment would produce similar differences in appearance judgments. This could help clarify whether the social media context influences the appraisal of appearance or appearance comparisons. Suppose it is appearance comparisons, not appraisal, that are affected by context, as suggested by social comparison theory. In that case, this might also explain the null results regarding stimuli type in this

study—that is, our tendency to make upward comparisons rather than overall judgments of attractiveness or slimness that affect body satisfaction when viewing idealized bodies. However, since we did not directly measure social comparison here, this explanation remains speculative.

Viewing these images in the Instagram app led to a change in body size estimations, with participants judging their bodies as slightly larger after exposure to the stimuli. This was not observed when the same images were viewed in the lab. Research indicates that individuals with disordered eating and low body satisfaction may also exhibit changes in their body size perception. Furthermore, a neural link exists between body satisfaction and body perception in healthy controls (Keizer et al., 2011; Keizer et al., 2013; Preston & Ehrsson, 2016). These findings suggest that brief exposure to fitspiration-style content, especially on Instagram, does alter an individual's body size estimates. However, this effect disappeared when controlling for concerns about shape and weight. This underscores the complexity of the relationship between body satisfaction, size estimation, social media exposure, and disordered eating thoughts and behaviors. It may be that individuals already vulnerable to negative thoughts and feelings about their bodies are more likely to experience changes in body size estimation after viewing appearance-related content on social media, as previous meta-analyses have suggested (Ferguson, 2013). Additionally, this measure appears more influenced by attitudes toward the body rather than body perception itself, unlike the door aperture task in experiment one, which was a more implicit measure of perceived body size. Nevertheless, the slight differences observed between body satisfaction and body size estimations suggest they assess somewhat different constructs.

Decreases in body satisfaction after viewing stimuli on Instagram could not be attributed to underlying disordered eating thoughts and behaviors. This indicates that brief exposure to appearance-related social media content on Instagram alone can reduce people's satisfaction with their bodies, regardless of their baseline concerns. Since these effects are specific to the app and do not occur when viewing the same images in isolation, other elements of social media content, such as comments, likes, and captions, might influence body satisfaction more than the images themselves. In the second experiment, participants were told they could interact with the photos as they would with other social media content, such as liking or commenting. Some participants did engage in this interaction, but due to anonymity, it's unclear which ones. There may be something about the social context of a social media platform that could intensify the negative effects of viewing these types of images. Very little research has directly compared the effects of viewing the same images in a lab setting versus on social media, which future studies should address. Research shows that making attractiveness judgments in a lab is similar to doing so in real life (Tovee et al., 2017); however, the same may not apply to the effects of interacting with social media content on the platforms themselves. It's worth noting that in this experiment, we focused specifically on the role of viewing the body; stimuli did not display the models' heads. Previous research indicates that the face and body contribute independently to attractiveness (Peters, Rhodes & Simmons, 2007), but how social comparisons are made using the face and body has not been explored in this research. Nevertheless, selfies are often taken to showcase the model's face, and common filters and enhancements on social media—such as those used with apps like Facetune and Perfect365—contour the face, enlarge lashes and lips, and add volume to hair. Including the face in selfies could amplify the negative impact these stimuli have on viewers, with the effect of viewing the body alone being minimal. Future studies should directly compare the effects of viewing selfies of just the body, just the face, and those that feature both. Although selfies are often judged as slimmer than other images, this does not appear to significantly increase the risk of body dissatisfaction for viewers (at least not to an extent detectable in these experiments). Still, these results suggest that even viewing the body on platforms like Instagram might have harmful effects. Additionally, the way stimuli are presented could influence how viewers are affected, which may help explain previous inconsistent findings.

We also only recruited female participants for this study. Some research indicates that gender may influence how social media affects thoughts and feelings about the body (Mahon & Heavey, 2021). Men might experience more concerns related to muscularity after appearance-related social media use, rather than traditional disordered eating thoughts and behaviors (Lonergan et al., 2021). Since research suggests that social media effects are probably affected by gender, our focus was on female participants viewing bodies presented as female. However, future research should examine effects on men and explore whether they are similar to those observed in women. We also did not recruit more participants than what the power analysis recommended. This may have limited our findings due to individual differences in social media use and disordered eating thoughts and behaviors. Nevertheless, over-recruiting could have made interpretations less solid and increased the risk of overinterpreting very small effects, so a cautious approach seemed wise. Future studies might consider how to interpret power analysis in relation to variables like social media use and disordered eating measures or target specific demographics to identify who might be especially vulnerable to social media content.

Research on how social media influences various mental health experiences faces similar challenges, especially regarding how to assess these behaviors in a way that is both ecologically valid and experimentally controlled (Orben, 2020). We used the Photographic Figure Rating Scale to see if body size estimation changed (measured via the door aperture task in the lab-based study). However, there is limited psychometric evidence supporting the reliability of this scale, so results should be interpreted with caution (Swami et al., 2012). It is important for researchers to work toward developing reliable experimental measures that can effectively capture these complex phenomena in a way that is accessible for social media research and prioritizes ecological validity. As highlighted throughout this article, accurately capturing the experience of social media use and its impact on disordered eating thoughts and behaviors is difficult due to the complexity of these phenomena. A key goal for future research should be the collaborative development of these paradigms to facilitate accurate and rigorous investigation in this area. Participants who reported spending more time on social media on average each week also reported lower baseline body satisfaction. Although this is only a weak correlation, it supports previous findings suggesting that social media might influence body satisfaction, albeit to a small extent (Fiorovanti et al., 2022). Additionally, a weak relationship was found between social media use and changes in body satisfaction after viewing fitspiration images, with more time spent on social media associated with a greater decrease in body satisfaction following the images. Recent research generally finds no direct effects of social media use on body satisfaction; however, indirect effects are observed, such as social comparisons mediating the relationship over time. Higher social media use predicts more social comparisons, which in turn lead to lower body satisfaction (Jarman, McLean, Slater, Marques & Paxton, 2021). The correlations we identified support the idea that these factors may be connected in the long term. Given the complexity of body satisfaction, it is reasonable to assume that any contributing factors would likely play small but significant roles (Cash, 2004). Increased time on social media was also weakly associated with greater shape and weight concerns, preoccupation, eating concerns, and restriction-related thoughts and behaviors. This aligns with previous studies showing that overall social media use can relate to disordered eating concerns, possibly through appearance comparisons (Griffiths et al., 2018; So & Kwon, 2023). Alternatively, it may be that individuals experiencing higher levels of disordered eating thoughts and behaviors spend more time on social media. Future research will need to explore the direction of this relationship. Replicating complex behaviors, such as using social media, in experimental conditions is incredibly challenging. Even when asking participants to browse the images on their own devices, the act of doing so was undoubtedly not the same as naturalistic social media use. As a result, it is challenging to determine whether these findings can be applied more broadly to actual social media use. For example, the effect of the closeness of a relationship an individual has with the person whose images they are viewing, or whether there is an impact from surrounding information such as captions, likes, and comments, is not captured here. Furthermore, social media is constantly evolving, and much of the body-related content currently consumed is in the form of reels rather than still images. In addition, the participants were predominantly young white women, so the study did not capture a representative range of experiences, given the impact that social identity may have on body satisfaction and size estimation.

This research suggests that viewing images in social media contexts has a unique impact on body satisfaction, whereas viewing the same images in isolation does not produce the same effects. Seeing these kinds of images on social media platforms may also influence perceptions of body size, but this is more likely due to underlying disordered eating thoughts and behaviors related to shape and weight concerns. Individuals more vulnerable to body image issues are likely to experience a greater effect on their overall body satisfaction from viewing appearance-related content on social media. Future research could investigate the specific characteristics of the social media environment that enhance its impact on body satisfaction.

Statement of Researchers

Researchers' contribution rate statement:

First author: conceptualization, data curation, formal analysis, investigation, methodology, writing – original draft.

Second author: supervision, conceptualization, validation, writing – review and editing.

Conflict statement:

The authors declare that they have no conflict of interest.

Data Availability Statement:

Anonymized data are freely available via the OSF repository. osf.io/bhj5c/

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This study was approved by the University of York's Institutional Research Ethics Committee (Approval No. 886) on September 15, 2020

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Ruth completed a PhD in Psychology at the University of York followed by a postdoctoral position with Converge at York St John University. She joined York St John University as a Lecturer in 2022 and was promoted to Senior Lecturer in 2024. Ruth's research focuses on mental health experiences in marginalized communities, with a particular interest in the experiences of disordered eating. She uses co-produced, mixed methods approaches.

Catherine completed a Ph.D in Psychology at the University of Nottingham followed by postdoctoral positions in Nottingham and Karolinska Institutet, Stockholm. During her postdoc she was awarded two fellowships: the Wenner Gren foreign researcher fellowship and Marie Curie Intra European Fellowship. Catherine started a Lecturership at the University of York in 2015, being promoted to Associate Professor in 2022. Catherine's research focuses on body representations, including body perception, interoception, neural mechanisms and emotional experience of the body. In 2024 Catherine was elected as co-chair of the Body Representation Network (BRNet)

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