Like for Like: The Effect of Idealised Instagram Photos on the Body Satisfaction of Young Girls

Rhea Milson

Supervisor: Dr Katri Cornelissen 2019

What is the Effect of Idealised Instagram Photos on the Body Satisfaction of Young Girls, and Does This Effect Depend Upon the Tendency to Make Social Comparisons?

ABSTRACT

Background: Previous research has reported that idealised photos on Instagram negatively affect the body satisfaction of teenage girls, and that social comparison tendencies mediate this effect (Kleemans, Daalmans, Carbaat & Anschütz, 2016). However, the previous research has many methodological limitations which need to be addressed. Furthermore, little research has explored this effect in younger girls.

Objectives: This study aimed to investigate how social comparison tendencies predict changes in the body satisfaction of young girls, and how exposure to edited and unedited photos influence this relationship.

Methods: An experimental multi regressional design was used for this study, to improve upon the methodological flaws of previous research. Opportunity sampling recruited 63 female participants aged 8-12 years, who completed measures of social comparison tendencies and body satisfaction. Participants were then exposed to edited or unedited Instagram photos and completed the measure of body satisfaction for a second time.

Results: The main findings were that social comparison tendencies did not significantly predict changes in body satisfaction, and exposure to edited/unedited photos did not influence this relationship.

Conclusions: Potential implications include improving education for pre-teens regarding photo retouching on Instagram, in order to reduce the negative effects of exposure to these images, during teenage years. Future research ideas include exploring a critical period during the transition from childhood to adolescence, in which girls may become more vulnerable to the effects of viewing idealised Instagram photos, due to a change in the frequency or nature of social comparisons during this critical period.

KEY WORDS:	INSTAGRAM	BODY SATISFACTION	SOCIAL COMPARISON TENDENCIES	IDEALISED PHOTOS

Introduction

It has been reported that media exposure has hugely negative effects on female body satisfaction, which refers to how happy an individual is with their body (Risica, Weinstock, Rakowski, Kirtania, Martin & Smith, 2008). Early research into the effects of exposure to traditional media, (such as television and music videos), on body satisfaction has suggested that although media images appear to be realistic, they are in fact heavily edited and idealised (Richins, 1991). Furthermore, these unrealistic images promote a thin ideal to young women, which can lead to body dissatisfaction (Thompson & Heinberg, 1999). Hargreaves and Tiggemann (2004) supported this, reporting that teenage girls who were exposed to idealised images of beauty in television commercials had increased body dissatisfaction, compared to girls who were exposed to television commercials that did not focus on appearance. This suggests that idealised media images negatively affect the body satisfaction of teenage girls.

Tiggemann and Slater (2004) furthered this, by exploring the underlying processes involved in the effect of idealised media images on the body satisfaction of young women. This study found that exposure to idealised images in music videos, induces appearance concerns and elicits the process of social comparison, (comparing oneself to others), which subsequently leads to body dissatisfaction. Therefore, this study suggests that social comparison tendencies mediate the effect of media exposure on body satisfaction. However, Botta (1999) reported contrasting findings when exploring the role of social comparisons. This study asked participants how much they compare themselves to idealised images of celebrities and models, when watching television and reported that social comparison tendencies did not significantly mediate this effect. Therefore, there are conflicting findings for the mediating effect of social comparison tendencies in relation to media exposure and body satisfaction.

Miller, Turnbull and McFarland (1988) helped to explain these contrasting findings, by suggesting that a significant mediating effect of social comparison tendencies may not have been found, due to celebrities being the target of comparison. This study suggested that in order for social comparisons to be made, the observer needs to see themselves as similar to the person they are comparing themselves too, which is in line with Festinger's (1954) social comparison theory. Furthermore, this study suggested that women are less likely to see themselves as similar to a celebrity on television, therefore, comparisons are less likely to be made. Cash, Cash and Butters (1983) supported this, reporting that when young women compared themselves to an attractive non-professional model, they had lower body satisfaction, than when they compared themselves to an attractive professional model. Furthermore, Jones (2001) suggested that teenage girls are less likely to compare their appearance to models or celebrities, as their bodies are seen as unattainable. Whereas, teenage girls are more likely to compare themselves to their peers, as peers are seen as more similar. It would therefore seem that media platforms, that enable comparisons towards peers, need to be investigated when exploring the mediating effects of social comparison tendencies, rather than traditional media platforms that only present images of celebrities and models.

More recent research has explored the role of peer comparisons within the media, suggesting that in today's society young women are becoming increasingly exposed to unrealistic and edited photos of their peers, (as opposed to just celebrities), due to social media (Bell, 2011; Harrison, 2014; Tiggemann, 2010). Social networking sites are online platforms which allow users to create a profile and interact with others in many ways (Tiggemann & Slater, 2017). One of which is sharing and posting photos, and in particular posting selfies (a photo one has taken of oneself), which other users can then 'like' (Saltz, 2014).

Tiggemann and Slater (2013) investigated the effect of social media exposure on the body satisfaction of teenage girls. This study found that participants who used Facebook (75% of the sample had a Facebook profile), were significantly more concerned with their body, than participants who did not use Facebook. This suggests that teenage girls who are exposed to social networking sites such as Facebook, are

more likely to have body dissatisfaction. However, despite these convincing findings, this study was limited as it failed to explain why this effect may be happening.

Fardouly and Vartanian (2015) expanded on the previous research by exploring why exposure to social media negatively affects body satisfaction, in female college students. In addition to reporting that Facebook usage was positively correlated to body dissatisfaction, this study also found that this association was mediated by social comparison tendencies, due to peers being the target of the comparison, as suggested by previous research (Jones, 2001; Strahan, 2006). This therefore suggests that spending time on Facebook enables greater opportunities to make comparisons with peers, which can lead to lower body satisfaction. However, as a correlational design was employed in this study, cause and effect cannot be determined.

Fardouly, Diedrichs, Vartanian and Halliwell (2015) conducted experimental research to explore the effect of social media exposure on body satisfaction, and how social comparison tendencies mediate this effect. This study found that Facebook usage had a significant direct effect on mood but not on body satisfaction in women. However, it was found that women with high social comparison tendencies, who browsed Facebook rather than an appearance-neutral website, had significantly greater appearance concerns. This supports the idea that social comparison tendencies play a mediating role between Facebook use and body satisfaction. However, this study was limited as participants were permitted to browse Facebook freely in the allotted time, meaning the content that the participants viewed was not controlled. This may have limited the findings, as Facebook provides a broad range of content, such as life experiences and status updates, not just images. Therefore, not all of the participants may have been exposed to idealised images of their peers during the allotted time. Instead, some of the participants may have been exposed to other Facebook content, meaning participants could have been comparing themselves to their peers based on their lives and experiences, rather than their appearance. Chou and Edge (2012) furthered this, suggesting that when women compare themselves to their peers based on their lives being better or happier, as opposed to comparing appearance, this can negatively affect mood but not body satisfaction. This may therefore help to explain why Facebook usage significantly predicted negative mood, in the study by Fardouly et al. (2015), but not body dissatisfaction. Furthermore, this suggests that appearance-

focused social media platforms, that provide only image-based content, need to be explored when investigating how idealised images on social media affect body satisfaction, in order to eliminate the influence of other content available on social media.

Instagram is a purely image-based social media app that enables users to edit their photos (mainly selfies), using various filters, in order to idealise the appearance of their photos, and share them instantly (Hu, Manikonda & Kambhampati, 2014). Brown and Tiggemann (2016) explored how exposure to edited photos of peers on Instagram affected the body satisfaction of female undergraduate students. This study found that idealised photo exposure led to increased body dissatisfaction, and that appearance-focused social comparisons mediated this relationship. Hendrickse, Arpan, Clayton and Ridgway (2017) supported this, reporting that engaging in Instagram activities positively predicted body dissatisfaction, and that this relationship was mediated by social comparisons. These studies therefore suggest that Instagram use negatively affects the body satisfaction of young women who frequently engage in social comparisons. However, the correlational nature of these studies limits the findings.

Burnette, Kwitowski and Mazzeo (2017) recruited 6 focus groups, to explore the effect of Instagram exposure on the body satisfaction of teenage girls. Thematic analysis identified that Instagram was the most popular social media platform, and that participants interacted with peer content more than any other content, supporting the previous research (Jones, 2001; Strahan, 2006). Endorsement of appearance comparisons also emerged as a theme, however, in many of the groups, this was also denied. This may be because of the limitations that come with focus group methodology, such as social desirability. Wood (1996) supported this, suggesting that social comparisons can be considered as socially undesirable, therefore, the participants may not have wanted to admit that they were influenced by these comparisons.

Kleemans et al. (2016) reduced the effects of social desirability, when exploring the effect of idealised Instagram images on the body satisfaction of girls aged 14-18 years. In this study, participants were exposed to either edited or unedited Instagram photos of peers, and then completed measures of body satisfaction and social comparison

tendencies. This improved upon the previous research, as this study used an experimental design and participants' responses were privately measured, rather than being shared in a focus group. Kleemans et al. (2016) found that participants exposed to edited photos had significantly lower body satisfaction than participants exposed to unedited photos. This study also found that participants with higher social comparison tendencies had significantly lower body satisfaction, than participants with lower tendencies. Finally, this study found that edited photos had a significantly greater effect on body satisfaction, for participants with higher social comparison tendencies, compared to participants with lower tendencies. These findings suggest that exposure to idealised images on Instagram negatively affect the body satisfaction of teenage girls, and that social comparison tendencies mediate this effect.

However, Kleemans' et al. (2016) study has methodological limitations, as baseline measures of body satisfaction were not taken. Therefore, it is difficult to say whether the induction of being exposed to edited/unedited photos affected body satisfaction, or whether these findings were just incidental. Furthermore, social comparison tendencies were investigated as two inappropriately split, unequal groups (high/low scorers), rather than a continuum of scores, which may have influenced the findings. As well as this, Kleemans' et al. (2016) study, along with the previously mentioned studies, only recruited teenage girls and young women. Therefore, the previous research fails to acknowledge that girls as young as 8 years old are accessing Instagram (despite the age restriction of 13 years) and are being exposed to idealised images of their peers (Ofcom, 2017). Research also suggests that girls as young as 8 years old report body dissatisfaction after playing with unrealistically thin dolls (Jellinek, Myres & Keller, 2016), and prefer the socially acceptable thin ideal (Grogan & Wainwright, 1996). This suggests that young girls are sensitive to the cultural pressures of conforming to ideal body shapes, in the same way that teenagers and young women are. Furthermore, this suggests that exposure to idealised images on Instagram may also negatively affect the body satisfaction of young girls in the same way that it affects teenage girls and young women. Therefore, further research is needed to explore this.

Overall, the previous research suggests that idealised images of peers on social media can negatively affect the body satisfaction of teenage girls and young women, and that

social comparison tendencies mediate this effect (Fardouly et al., 2015). The most recent research highlights the importance of exploring the effects of exposure to idealised images on appearance-focused social media platforms, such as Instagram (Kleemans et al., 2016). However, even the most recent research is limited as it focuses on teenage girls and young women and has not explored this effect in younger girls.

The current study aimed to replicate and further the findings by Kleemans et al. (2016), by using improved methodologies to explore whether social comparison tendencies predict changes in body satisfaction, and whether this relationship is influenced by exposure to edited/unedited Instagram photos. This study also aimed to control the effects of age on body satisfaction, in line with the previous research (Ålgars, 2009; Kleemans, 2016; Myres, 2009). The research question was “what is the effect of idealised Instagram photos on the body satisfaction of young girls, and does this effect depend upon the tendency to make social comparisons?” Firstly, it was hypothesised that as an overall sample, participants would show significantly reduced body satisfaction after viewing the photos. Furthermore, participants exposed to edited photos would show lower body satisfaction after the induction, than participants exposed to unedited photos, in accordance with findings by Kleemans et al. (2016). Secondly, it was hypothesised that participants with higher social comparison tendencies would have lower body satisfaction than participants with lower social comparison tendencies. Furthermore, participants who have higher social comparison tendencies would show a greater reduction in body satisfaction, as a consequence of the induction, compared to participants with lower social comparison tendencies, as suggested by Kleemans et al. (2016). Thirdly, it was hypothesised that participants exposed to edited photos would show a significantly greater reduction in body satisfaction, compared to participants exposed to unedited photos. Furthermore, the negative effect of edited photos on body satisfaction would be significantly greater for participants with higher social comparison tendencies, compared to participants with lower social comparison tendencies, following the suggestions by Kleemans et al. (2016). Finally, it was hypothesised that exposure to unedited photos would influence the relationship between social comparison tendencies and body satisfaction, but to a lesser extent than exposure to edited photos; expanding on the findings by Kleemans et al. (2016).

Method

Design

An experimental multi regressional design was used. A mixed model was built to investigate how social comparison tendencies predict changes in body satisfaction for participants exposed to edited photos, compared to participants exposed to unedited photos. The between groups factor was photo manipulation (edited photos/unedited photos). The repeated measures factor involved each participant being exposed to a repeated number of photos. The dependent variable was body satisfaction. The covariates were age and social comparison tendencies. Research suggests that increasing age can affect body satisfaction (Ålgars et al., 2009), and so can social comparison tendencies (Kleemans et al., 2016). Therefore, these variables needed to be controlled in the current study.

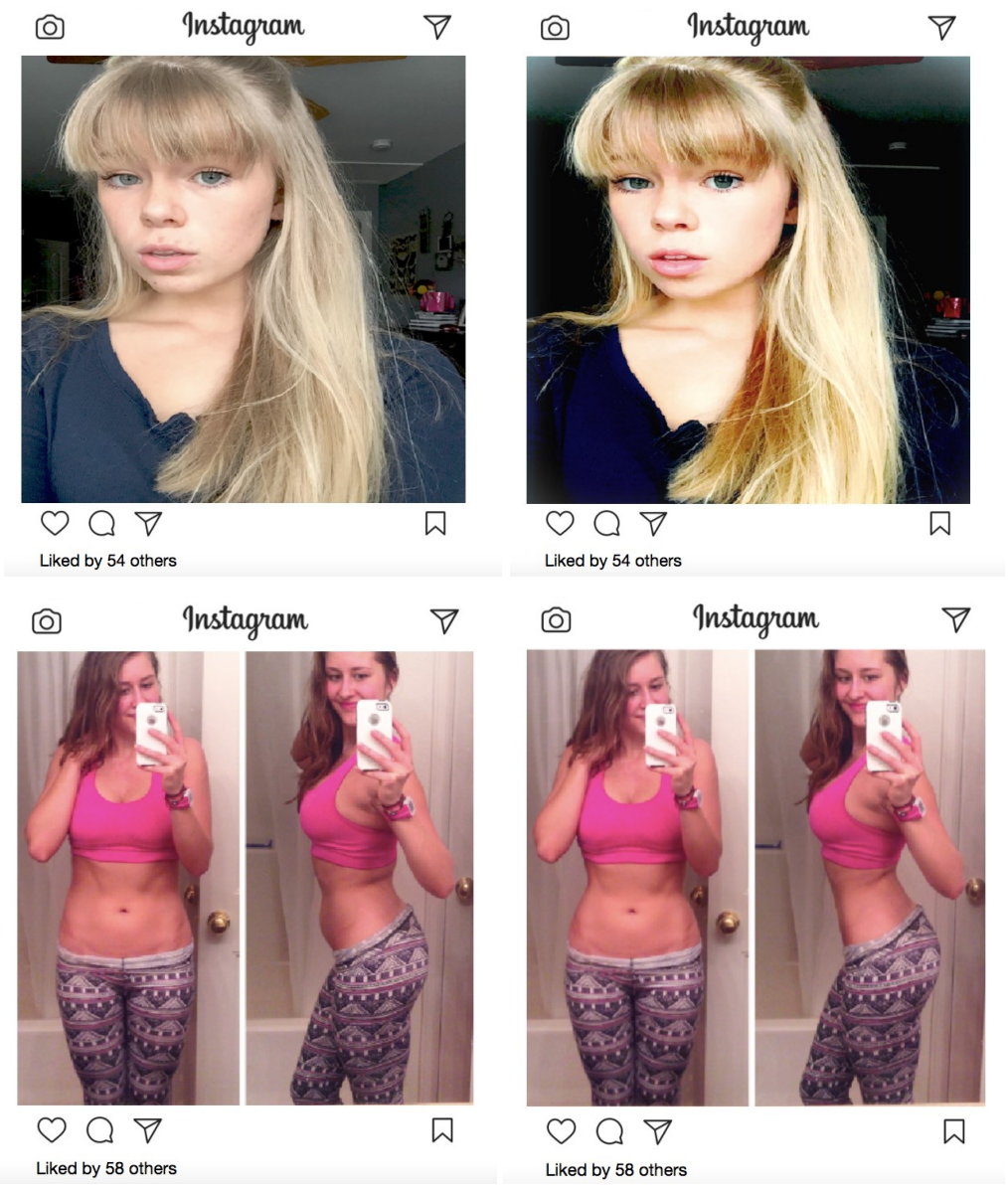
Participants

Opportunity sampling recruited 63 female participants, aged 8-12 years (M = 10.9, SD = 1.24), from a secondary school, a primary school, and two dance schools. Participants were approached by the researcher and asked to take part. Inclusion criteria included females aged 8-12 years. Exclusion criteria included anyone with a diagnosis of an eating disorder or body image disorder, due to the nature of the study, and anyone with a sight impairment, due to the task requirements. 32 participants were randomly assigned to the edited photos condition (M = 10.9, SD = 1.22). 31 participants were randomly assigned to the unedited photos condition (M = 10.9, SD = 1.28). Participants were not aware of the true purpose of the study; however, parents of the participants were aware of the true purpose of the study.

Materials

The stimuli consisted of 10 selfies of young females, which had been validated for use by Kleemans et al. (2016). Selfies were used as research suggests that selfies are the most popular type of image posted on Instagram (Hu et al., 2014). Each photo depicted one young female that represented the similar peers that young girls are exposed to on Instagram, (as opposed to celebrities or models), as Jones (2001) suggested that in order for comparisons to be made, the observer must consider themselves to be similar to the person they are observing. 5 of the stimuli emphasized the whole body,

and the other 5 emphasized the face, as Fardouly et al. (2015) suggested that exposure to selfies that emphasise the face, skin and hair can negatively affect body satisfaction, (especially when combined with high social comparison tendencies), in the same way that full body selfies can, (see Figure 1).



<u>Figure 1:</u> Examples of unedited versus edited Instagram photos, emphasising face, skin and hair (top), and the whole body (bottom).

Each photo was edited individually. The full body selfies were edited to make the waist and legs slimmer, and the facial selfies were edited to make the face slimmer, skin

smoother and hair brighter, as Chua and Chang (2016) suggested that these areas are the most common areas that are retouched on Instagram photos. Instagram editing techniques were also applied to all of the photos, including various filters to alter brightness and colour intensity. The photos were then displayed in a mock Instagram format. Chua et al. (2016) also suggested that young girls consider the number of likes on a photo to indicate a better physical appearance. Therefore, in the current study, the original and edited version of each photo were given the same number of likes, in order to exclude this as a confounding factor.

Participants were exposed to the photos via a timed PowerPoint presentation, to ensure the task was standardised for every participant, and consequently to improve the reliability of the study. The PowerPoint consisted of 11 slides. The first slide informed the participants of how many photos they would be presented with. The next 10 slides each contained one of the photos. Fardouly et al. (2015) suggested that allowing participants to freely browse social media leads to uncertainly over whether all participants have been exposed to the same number of idealised photos. Therefore, the current study controlled the number of photos that participants were exposed to, in order to keep the procedure standardised for each participant.

The Revised Comparison Orientation Measure was used to measure social comparison tendencies and consisted of 10 items. The items were taken from the Iowa-Netherlands Comparison Orientation Measure (Gibbons & Buunk, 1999), used in Kleemans' et al. (2016) study ($\alpha = .87$), but were revised to be appropriate for younger children to understand. Each item used a 5-point Likert scale, ranging from totally disagree (1) to totally agree (5). An example of the items used is as follows, "I compare myself to other people." Items 6 and 9 needed to be reversed scored before a mean score of all items was calculated. The lowest possible score was 1 and the highest possible score was 5. Higher scores indicated higher social comparison tendencies.

The Revised Body Image States Scale was used to measure body satisfaction and consisted of 6 items. The items were taken from The Body Image States Scale (Cash, Fleming, Alindogan, Steadman & Whitehead, 2002), used in Kleemans' et al. (2016) study ($\alpha = .83$), but were revised to be appropriate for younger children to understand.

The 6 items tapped into different domains of body satisfaction, including happiness with body shape, weight and overall physical appearance, as well as current feelings of appearance compared to how one usually feels, and current feelings of appearance relative to how the average person looks. Each item used a 9-point, bipolar, Likert scale, that was semantically anchored at each point. 3 of the items were presented in a negative-positive direction, ranging from extremely unhappy (1) to extremely happy (5). The other 3 items were presented in a positive-negative direction, ranging from extremely happy (1) to extremely unhappy (5). The questionnaire instructions stated that participants should respond to each item based on how they are feeling right now. Items 2, 4, and 6 needed to be reversed scored, before a mean score of all items was calculated. The lowest possible score was 1 and the highest possible score was 9. Higher scores indicated higher body satisfaction. Likert scales were used in both questionnaires to allow for easy analysis of the data.

Procedure for Study

Ethical clearance for all procedures was approved by the Undergraduate Psychology Ethics Committee at Northumbria University (see Appendix A). Firstly, four schools were approached and asked if they would be happy to give consent for their students to take part, (see Appendix B). Following this, parents were approached and shown an information sheet explaining the true purpose of the study, (see Appendix C). Parents were then asked to sign a consent form, giving permission for their child to participate, (see Appendix D). Participants were then approached and asked if they would be happy to take part. Participants were shown a revised information sheet which described a cover story, (see Appendix E), as it was important that participants were not influenced by the true purpose of the study. Fardouly et al. (2015) explored the effects of social media usage on body satisfaction and reported that if participants were to guess the true purpose of the study, this could influence their responses to the questionnaires. Therefore, in the current study, participants were told that the aim of the study was to explore how different facial expressions and body language are perceived on social media. Participants were then asked to give verbal consent and were each given a random participant number. Following this, participants were asked to individually fill out The Revised Comparison Orientation Measure, (see Appendix F). Participants were then asked to fill out The Revised Body Image States Scale, (see Appendix G), in order to gain a baseline measure of body satisfaction for each

participant. Participants were then randomly assigned to the edited photos condition or the unedited photos condition. Participants in the edited photos condition watched a PowerPoint presentation on a laptop, containing the 10 edited photos, and participants in the unedited photos condition watched a PowerPoint presentation on a laptop, containing the 10 unedited photos. Following this, participants individually filled out The Revised Body Image States Scale for a second time. Participants were then debriefed, (see Appendix H), and the true purpose of the study was explained. Participants were also given a parental debrief sheet and were asked to share this with their parents (see Appendix I). Participants were then informed about how to withdraw their data and thanked for their time. The procedure took approximately 10-15 minutes for each group, however, there was not a strict time frame.

Results

Treatment of Data

The data from each of the three questionnaires was treated separately. For the Revised Comparison Orientation Measure, a mean score was calculated for each participant. Higher scores indicated higher social comparison tendencies. For the Revised Body Image States Scale (time point 1), a mean score was calculated for each participant. This was also the case for time point 2 scores. Higher scores indicated higher body satisfaction. The data was manually entered into IMB SPSS Statistics 25 and Cronbach's alpha was calculated for the three questionnaires, which showed acceptable alpha levels for the Revised Comparison Orientation Measure ($\alpha = .77$), the Revised Body Image States Scale 1 ($\alpha = .80$), and the Revised Body Image States Scale 2 ($\alpha = .89$). Following this, descriptive statistics were calculated, (see Table 1).

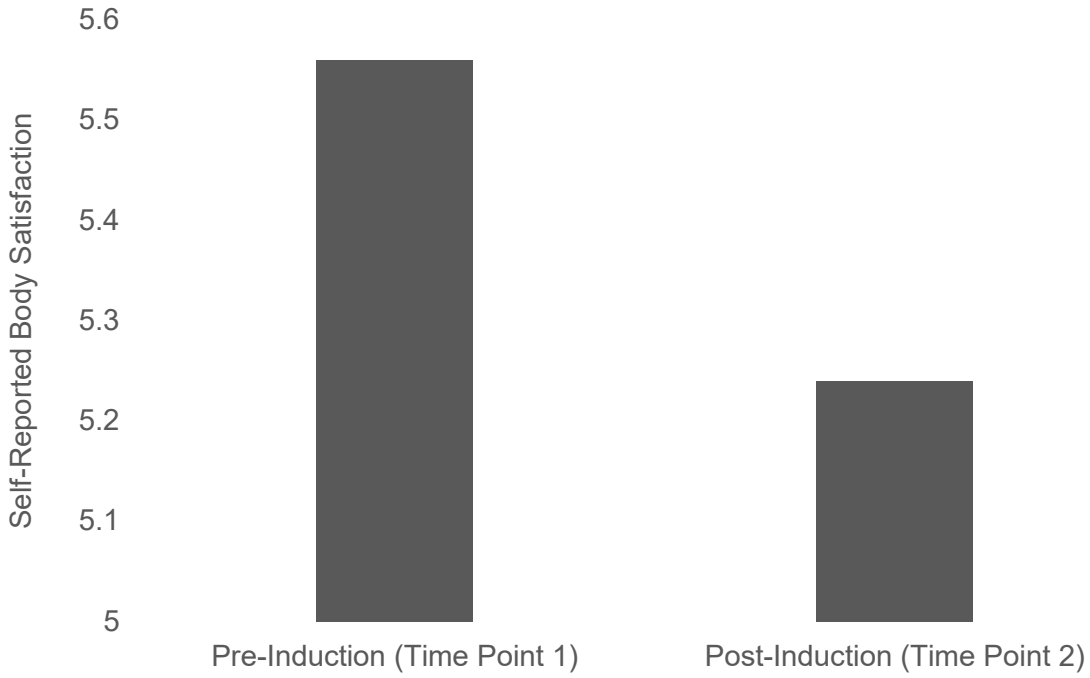
Table 1: Means and Standard Deviations of participants' age, for whole sample (n = 63), group 1 sample (n = 32), and group 2 sample (n = 31).

	All Participants (n = 63)	Group 1 (Edited Photos) (n = 32)	Group 2 (Unedited Photos) (n = 31)
Mean	10.91	10.94	10.87
Standard Deviation	1.241	1.217	1.284

Hypothesis 1

In accordance with the findings by Kleemans et al. (2016), the first hypothesis was that as an overall sample, participants would show significantly reduced body satisfaction after viewing the photos. Furthermore, participants exposed to edited photos would show lower body satisfaction after the induction, than participants exposed to unedited photos. To test the first part of this hypothesis a one-way repeated measures ANOVA was conducted. The dependent variable was body satisfaction and the repeated measures factor was time (pre-induction/post-induction).

The ANOVA revealed that there was a significant effect of time on body satisfaction ($f(1,62)=10.304$, $p=.002$). Overall, participants showed significantly reduced body satisfaction at time point 2 (post-induction) ($M = 5.24$) compared to time point 1 (pre-induction) ($M = 5.56$). This can be seen in Figure 2.



<u>Figure 2:</u> Body satisfaction of overall sample before exposure to photos (pre-induction) and after exposure to photos (post-induction), (n = 63).

A one-way independent groups Analysis of Covariance (ANCOVA) was conducted to test the second part of this hypothesis. An ANCOVA was conducted, as opposed to a t-test, due to Kleemans et al. (2016), highlighting the importance of controlling the factor of age. The dependent variable was body satisfaction, the independent groups factor was photo manipulation (edited/unedited), and the covariate was age.

The homogeneity of regression slopes assumption was tested by examining the interaction between the independent groups factor (edited or unedited photos) and the covariate (age). The interaction was not significant ($f(1,59)=.506$, $p=.480$). Therefore, the assumption was not violated.

Table 2: Means and Standard Deviations of body satisfaction for participants exposed to edited and unedited photos (n = 63).

	Group 1 (Edited Photos) (n = 32)	Group 2 (Unedited Photos) (n= 31)
Mean	5.35	5.12
Standard Deviation	1.534	1.914

The ANCOVA revealed that there was a non-significant effect of photo manipulation on body satisfaction, when the covariate of age was controlled ($f(1,60)=.340$, $p=.562$). This can be seen in Table 2. Additionally, the ANCOVA revealed that the covariate of age had a non-significant effect on body satisfaction ($f(1,60)=2.996$, $p=.089$).

Hypothesis 2

Consistent with findings by Kleemans et al. (2016), the second hypothesis was that participants with higher social comparison tendencies would have lower body satisfaction than participants with lower social comparison tendencies. Furthermore, participants who have higher social comparison tendencies would show a greater reduction in body satisfaction, as a consequence of the induction, compared to participants with lower social comparison tendencies.

Firstly, distribution analysis was conducted, showing that the social comparison tendencies scores were normally distributed. Following this, outlier analysis was conducted, which identified four outliers. These outliers will be addressed later. Two categorical groups were then created for social comparison tendencies (higher/lower) by using a median split (Median = 2.9). A median split was used as opposed to a mean split, (as used by Kleemans et al., 2016), as this is an appropriate method to identify

two populations when the scores are normally distributed. This method also avoids unequal group sizes, unlike a mean split.

A one-way independent groups ANCOVA was conducted to test the first part of this hypothesis. Once again, an ANCOVA was conducted, as opposed to a t-test, due to Kleemans et al. (2016), highlighting the importance of controlling the factor of age. The dependent variable was body satisfaction (time point 1), the independent groups factor was social comparison tendencies (higher/lower) and the covariate was age.

The homogeneity of regression slopes assumption was tested by examining the interaction between the independent groups factor (higher or lower tendencies) and the covariate (age). The interaction was not significant ($f(1,59)=.957$, $p=.332$). Therefore, the assumption was not violated.

Table 3: Means and Standard Deviations of body satisfaction for participants with higher social comparison tendencies and lower social comparison tendencies (n = 63).

	Higher Social Comparison Tendencies (n = 33)	Lower Social Comparison Tendencies (n= 30)
Mean	5.36	5.78
Standard Deviation	1.509	1.319

The ANCOVA revealed that there was a non-significant effect of social comparison tendencies on body satisfaction, when the covariate of age was controlled ($f(1,60)=1.532$, $p=.221$). This can be seen in Table 3. Additionally, the ANCOVA revealed that the covariate of age had a significant effect on body satisfaction ($f(1,60)=4.788$, $p=.033$).

Following this, one-way independent groups ANCOVAs (with the covariate of age), and ANOVAs (without the covariate of age), were conducted, with the removal of three participants who scored the median score for social comparison tendencies, the removal of four participants whose score for social comparison tendencies were outliers, and the removal of both at the same time. The effect of social comparison tendencies on body satisfaction (time point 1) remained non-significant for all of the ANCOVAs. This eliminated the possibility that the non-significant finding was influenced by outliers or median scorers.

To test the second part of this hypothesis, a one-way independent groups ANCOVA was once again conducted. The dependent variable was change in body satisfaction from time point 1 to time point 2, the independent groups factor was social comparison tendencies (higher/lower) and the covariate was age.

The homogeneity of regression slopes assumption was tested by examining the interaction between the independent groups factor (higher or lower tendencies) and the covariate (age). The interaction was not significant ($f(1,59)=.369$, $p=.546$). Therefore, the assumption was not violated.

Table 4: Means and Standard Deviations of change in body satisfaction for participants with higher social comparison tendencies and lower social comparison tendencies (n = 63).

	Higher Social Comparison Tendencies (n = 33)	Lower Social Comparison Tendencies (n= 30)
Mean	.45	.16
Standard Deviation	.882	.653

The ANCOVA revealed that there was a non-significant effect of social comparison tendencies on the change in body satisfaction, when the covariate of age was controlled ($f(1,60)=2.198$, $p=.143$). This can be seen in Table 4. Furthermore, the ANCOVA revealed that the covariate of age had a non-significant effect on change in body satisfaction ($f(1,60)=.002$, $p=.962$).

Once again one-way independent groups ANCOVAs (with the covariate of age), and ANOVAs (without the covariate of age), were conducted, with the removal of three participants who scored the median score for social comparison tendencies, the removal of four participants whose score for social comparison tendencies were outliers, and the removal of both at the same time. The effect of social comparison tendencies on the change in body satisfaction remained non-significant for all of the ANCOVAs. This once again eliminated the possibility that the non-significant finding was influenced by outliers or median scorers.

Hypothesis 3

Following the findings by Kleemans et al. (2016), the third hypothesis was that participants exposed to edited photos would show a significantly greater reduction in body satisfaction, compared to participants exposed to unedited photos. Furthermore, the negative effect of edited photos on body satisfaction would be significantly greater for participants with higher social comparison tendencies, compared to participants with lower social comparison tendencies.

Although Kleemans et al. (2016) attempted to investigate interaction effects between photo manipulation and time, this study did not take pre-induction measures of body satisfaction. Therefore, a change in body satisfaction following the induction could not be assessed, meaning any findings were incidental. Therefore, the current study measured body satisfaction prior to the participants being exposed to edited/unedited photos (time point 1), as well as after the induction (time point 2), in order to appropriately measure the change in body satisfaction and explore the interaction between photo manipulation and time. To test the first part of the hypothesis, a 2 x 2 mixed ANCOVA was conducted. The dependent variable was change in body

satisfaction, the independent groups factor was photo manipulation (edited/unedited), the repeated measures factor was time (pre-induction/post-induction), and the covariate was age.

The homogeneity of regression slopes assumption was tested by examining the interaction between the independent groups factor (edited or unedited photos) and the covariate (age). The interaction was not significant ($f(1,59)=.046$, $p=.831$). Therefore, the assumption was not violated.

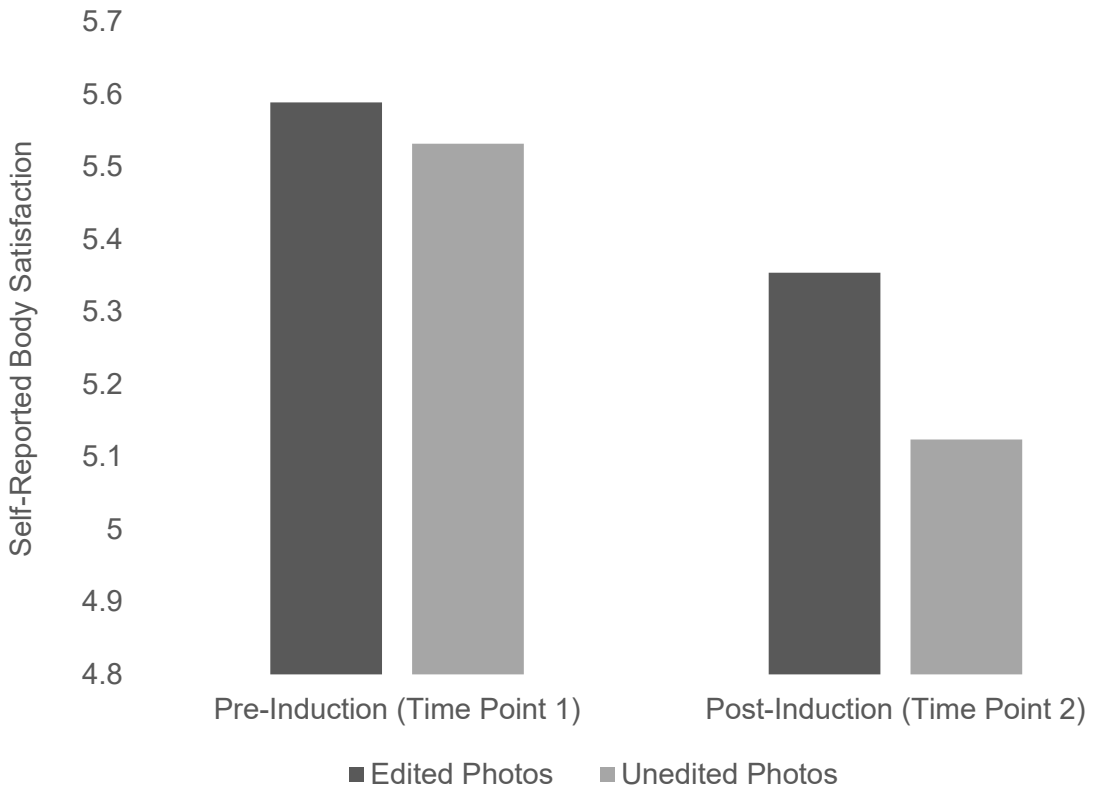
Firstly, the mixed ANCOVA revealed that there was a non-significant effect of photo manipulation on the change in body satisfaction, when the covariate of age was controlled, ($f(1,60)=.186$, $p=.668$). Secondly, there was a non-significant effect of time on the change in body satisfaction, when the covariate of age was controlled, ($f(1,60)=.166$, $p=.685$). Additionally, the covariate of age had a non-significant effect on the change in body satisfaction, ($f(1,60)=3.889$, $p=.053$). As well as this, there was a non-significant interaction between time and photo manipulation, ($f(1,60)=.745$, $p=.392$). This was also the case for the interaction between time and age, ($f(1,60)=.003$, $p=.960$).

To test the second part of the hypothesis, a 2 x 2 mixed ANCOVA was conducted once again. The dependent variable was change in body satisfaction, the independent groups factor was photo manipulation (edited/unedited), the repeated measures factor was time (pre-induction/post-induction), and the covariates were age and social comparison tendencies.

The homogeneity of regression slopes assumption was tested by examining the interaction between the independent groups factor (edited/unedited photos) and the covariate (age), ($f(1,56)=.007$, $p=.935$), and the interaction between the independent groups factor (edited or unedited photos) and the covariate (social comparison tendencies), ($f(1,56)=.143$, $p=.707$). As both interactions were non-significant, the assumption was not violated.

Firstly, the mixed ANCOVA revealed that there was a non-significant effect of photo manipulation on the change in body satisfaction, when the covariates of age and social comparison tendencies were controlled, ($f(1,59)=.030$, $p=.862$). Secondly, there was

a non-significant effect of time on the change in body satisfaction, when the covariates of age and social comparison tendencies were controlled, (f(1,59)=.035, p=.853). Additionally, the covariate of age had a significant effect on the change in body satisfaction, (f(1,59)=4.024, p=.049), whereas, the covariate of social comparison tendencies did not, (f(1,59)=3.663, p=.060). As well as this, there was a non-significant interaction between time and photo manipulation, (f(1,59)=.471, p=.495). This was also the case for the interaction between time and age, (f(1,59)=.003, p=.955), and the interaction between time and social comparison tendencies, (f(1,59)=1.587, p=.213). This can be seen in Figure 3.



<u>Figure 3:</u> The effects of edited versus unedited photos on body satisfaction before exposure to photos (pre-induction) and after exposure to photos (post-induction), whilst controlling the effects of age and social comparison tendencies (n = 63).

A mixed 2 x 2 ANOVA was also conducted, to test the interaction effects between photo manipulation and time, without the covariates of age and social comparison tendencies. The dependent variable was change in body satisfaction, the independent

groups factor was photo manipulation (edited/unedited), and the repeated measures factor was time (pre-induction/post-induction).

The mixed ANOVA revealed that there was a significant effect of time on the change in body satisfaction (f(1,61)=10.350, p=.002). Overall, participants exposed to edited photos showed significantly reduced body satisfaction at time point 2 (post-induction) (M = 5.35) compared to time point 1 (pre-induction) (M = 5.59), and participants exposed to unedited photos also showed significantly reduced body satisfaction at time point 2 (post-induction) (M = 5.12) compared to time point 1 (pre-induction) (M = 5.53). However, the mixed ANOVA also revealed that there was a non-significant effect of photo manipulation on the change in body satisfaction (f(1,61)=.136, p=.713). Furthermore, there was a non-significant interaction between time and photo manipulation, (f(1,59)=.760, p=.387).

This suggests that there is only a significant effect of time on the change in body satisfaction, when the covariates of age and social comparison tendencies are removed, and that photo manipulation has no effect on the change in body satisfaction, with and without the covariates of age and social comparison tendencies.

Hypothesis 4

In order to expand on the findings by Kleemans et al. (2016), the fourth hypothesis was that exposure to unedited photos would influence the relationship between social comparison tendencies and body satisfaction, but to a lesser extent than exposure to edited photos. To test this hypothesis, a dummy regression model was built up to try and predict body satisfaction from social comparison tendencies, and to explore whether the induction of being exposed to edited/unedited photos influenced this relationship. The dummy variable was photo manipulation (edited/unedited), the explanatory variable was social comparison tendencies, the outcome variable was change in body satisfaction, and the covariate was age. This new analysis improved upon Kleemans' et al. (2016) analysis (which explored between group differences of social comparison tendencies), by enabling the current study to explore variation within the participant group, due to using a continuum of social comparison tendencies scores, as well as identifying the difference in relationships.

Firstly, the photo manipulation variable was recoded to 0 (exposure to unedited photos) and 1 (exposure to edited photos), in order to represent the two groups, as a dummy variable. Following this, a matrix scatter plot was used to examine the distribution of the data and to check for any outliers and multicollinearity was also tested. Bivariate correlations were then calculated. This can be seen in Table 5.

Table 5: Bivariate correlations between age, social comparison tendencies, photo manipulation and change in body satisfaction (n = 63).

None of the variables possessed high multicollinearity as all Tolerance scores were greater than .1. The minimum tolerance score was .981.

Bivariate Correlations (r)

	Age	Social Comparison Tendencies	Photo Manipulation (Dummy)	Change in Body Satisfaction
Age		.001	.027	-.010
Social Comparison Tendencies			-.137	.161
Photo Manipulation (Dummy)				-.125
Change in Body Satisfaction				
Mean	10.91	2.88	.46	.31
Standard Deviation	1.241	.664	.502	.789

Block 1 (age and social comparison tendencies) was able to account for a non-significant 2.6% of the variance in the change in body satisfaction (R^2 = .026, f(2,60) = .800, p=.454). The addition of Block 2 (photo manipulation) led to a non-significant

improvement in the regression model, with an increase in R^2 of 1.1% (ΔR^2 =.011, f(1,59) = .655, p=.422). The two blocks combined explained 3.7% of the variance in the change in body satisfaction.

In the final model, age made a non-significant contribution to the regression model, β = -.008; t(59) = -.059, p = .953, as did social comparison tendencies, β = .147; t(59) = 1.136, p= .260. Photo manipulation also made a non-significant contribution, β = -.104; t(59) = -.809, p= .422.

Overall, there was a significant effect of time on body satisfaction, (when age and social comparison tendencies were not controlled), as participants showed reduced body satisfaction after being exposed to photos, compared to before this induction. However, with the inclusion of these covariates, photo manipulation did not significantly affect body satisfaction, nor did photo manipulation significantly influence the relationship between social comparison tendencies and body satisfaction. See Appendix J for all outputs.

Discussion

The aim of this study was to investigate how social comparison tendencies predict changes in body satisfaction for participants exposed to edited photos, compared to participants exposed to unedited photos, whilst controlling the effects of age. Overall, the findings revealed that social comparison tendencies did not significantly predict changes in body satisfaction. Furthermore, the findings suggested that photo manipulation did not significantly affect the relationship between social comparison tendencies and changes in body satisfaction.

The first hypothesis was that as an overall sample, participants would show significantly reduced body satisfaction after viewing the photos. Furthermore, participants exposed to edited photos would show lower body satisfaction after the induction, than participants exposed to unedited photos. The findings revealed that there was a significant effect of time on body satisfaction, (when age and social comparison tendencies were not controlled), as participants showed reduced body satisfaction after being exposed to photos, compared to before this induction.

However, when age and social comparison tendencies were controlled, photo manipulation (exposure to edited/unedited photos) did not have a significant effect on body satisfaction. Therefore, the first part of this hypothesis was supported, but the second part was not.

The second hypothesis was that participants with higher social comparison tendencies would have lower body satisfaction than participants with lower social comparison tendencies. Furthermore, participants who have higher social comparison tendencies would show a greater reduction in body satisfaction, as a consequence of the induction, compared to participants with lower social comparison tendencies. The findings suggested that social comparison tendencies did not have a significant effect on body satisfaction, when the covariate of age was controlled. Furthermore, social comparison tendencies did not have a significant effect on the change in body satisfaction, when the covariate of age was controlled. Therefore, the findings did not support the second hypothesis.

The third hypothesis was that participants exposed to edited photos would show a significantly greater reduction in body satisfaction, compared to participants exposed to unedited photos. Furthermore, the negative effect of edited photos on body satisfaction would be significantly greater for participants with higher social comparison tendencies, compared to participants with lower social comparison tendencies. The findings revealed that participants exposed to edited photos did not show a significantly greater reduction in body satisfaction, compared to participants exposed to unedited photos. Furthermore, the negative effect of edited photos on body satisfaction was not significantly greater for participants with higher social comparison tendencies, compared to participants with lower social comparison tendencies. Therefore, the third hypothesis was not supported.

The fourth hypothesis was that exposure to unedited photos would influence the relationship between social comparison tendencies and body satisfaction, but to a lesser extent than exposure to edited photos. The findings suggested that exposure to edited photos did not have a significantly greater influence on the relationship between social comparison tendencies and changes in body satisfaction, compared

to exposure to unedited photos. Therefore, the findings did not support the fourth hypothesis.

The hypotheses in the current study may not have been supported, due to the improved methodologies used. The methods employed by Kleemans et al. (2016) were flawed for many reasons. One of which was that body satisfaction was not measured prior to the induction. Hence, the findings by Kleemans et al. (2016) that suggest that exposure to edited photos leads to lower body satisfaction, than exposure to unedited photos, are incidental, as the edited photos group may have had lower body satisfaction on average than the unedited photos group prior to the induction. Therefore, it is possible that photo manipulation had no effect on the body satisfaction of the teenage girls in Kleemans' et al. (2016) sample, as the change in body satisfaction after the induction could not be measured. In the current study, baseline measures of body satisfaction were taken prior to the induction, in order to assess the change in body satisfaction after the induction. The current study found that photo manipulation did not significantly affect the change in body satisfaction of young girls. This difference in findings highlights the importance of baseline measures and supports a methodological explanation for why the hypotheses in the current study were not supported.

Previous research supports the importance of baseline measures. Posavac, Posavac, and Posavac (1998) exposed participants to either idealised or neutral images and reported that women who had lower body satisfaction prior to being exposed to idealised images, reported a reduction in body satisfaction after the induction. However, there was not a significant difference in body satisfaction

for women who did not have lower body satisfaction prior to the induction. This suggests that if women are initially satisfied with their bodies, they are less likely to be negatively affected by photo manipulation and exposure, whereas, if women are initially dissatisfied with their bodies, they are more likely to be negatively affected. Therefore, it may be the case that in Kleemans' et al. (2016) study, the sample of teenage girls were less satisfied with their bodies on average, prior to the induction, therefore explaining why photo manipulation and exposure had a significant effect on body satisfaction. Whereas, in the current study, the sample of young girls may have been more satisfied with their bodies on average, prior to the induction, which may

help to explain the non-significant findings, and why the hypotheses were not supported in the current study.

Another methodological limitation of the study by Kleemans et al. (2016), was that social comparison scores were only investigated as two groups (high/low scorers), which were calculated using a mean split. However, this mean split led to unequal group sizes, as the high tendencies group had nearly 25% more participants than the low tendencies group. Furthermore, it is possible that all the participants had high social comparison scores, but due to the mean split, the lowest of the high scorers were assigned to the lower tendencies group. Therefore, the between groups differences for the effect of social comparison tendencies on body satisfaction in teenage girls, reported by Kleemans et al. (2016), are unreliable, and may not actually be present in this sample. The current study improved upon these limitations by firstly using a median split to create two groups, as this is a more appropriate split to use, and avoids unequal groups sizes. The current study found that there was not a significant difference between higher and lower social comparison scorers, in terms of body satisfaction. The current study also explored social comparison tendencies as a continuum, in order to explore variation within the participant sample, as well as between groups differences, and found that social comparison tendencies did not significantly predict changes in body satisfaction. These contradictory findings, due to improved methods, suggest that the findings by Kleemans et al. (2016) are methodologically flawed and unreliable, and provide an explanation for why the hypotheses in the current study were not supported.

Previous research that conducted similar methods to the current study, supports this methodological explanation. Vogel, Rose, Okdie, Eckles and Franz (2015) conducted a dummy regression analysis to explore the effects of social comparison tendencies (based on the Iowa-Netherlands Comparison Orientation Measure, as used in the current study), on self-perceptions, for participants exposed to a social media profile belonging to a similar other, and participants exposed to their own social media profile. This study found that social comparison tendencies did not significantly affect self-perceptions (in the same way that social comparison tendencies do not significantly affect body satisfaction in the current study), when the scores were explored as a continuum rather than two groups. Furthermore, this supports the explanation that the

hypotheses in the current study were not supported, due to investigating social comparison tendencies as a continuum, rather than two inappropriately split groups, as conducted by Kleemans et al. (2016).
Further research, (using methods from the current study), needs to be conducted with teenage girls, in order to explore whether the difference in findings from the current study and the study by Kleemans et al. (2016), can be explained by the methodological limitations of Kleemans' et al. (2016) study. If this methodologically improved future research reveals non-significant findings for teenage girls as well as young girls, this would support these methodological explanations of why the hypotheses in the current study were not supported.

However, if this is not the case, another potential explanation for why the hypotheses in the current study were not supported, is that there is a difference between how young girls compare themselves to idealised photos on Instagram, compared to how teenage girls compare themselves. There are consistent findings for the negative effects of exposure to edited photos on the body satisfaction of teenage girls and young women, when social comparison tendencies are controlled (Kleemans; 2016; Fardouly, 2015). However, in the current study, there was no effect of photo manipulation on body satisfaction, when social comparison tendencies were included as a covariate. This suggests that young girls may not compare themselves and their body image personally to those images, in the way that teenage girls do.

Therefore, a new theory needs to be tested, regarding the possibility of a critical period during the transition from childhood to adolescence, in which girls become more vulnerable to the negative effects of exposure to edited Instagram photos, due to an increase in making personal comparisons to these images. Findings from both the current study and the study by Kleemans et al. (2016) provide a basis for this new theory, as on average the sample of young girls from the current study had lower social comparison tendencies (M = 2.88), than the sample of teenage girls from Kleemans' et al. (2016) study (M = 3.22). Vogel et al. (2015) also support this, reporting that the average social comparison tendencies score, (once again based on the Iowa-Netherlands Comparison Orientation Measure), for the sample of female undergraduate students who took part was higher (M = 3.10) than the average score from the current study. Furthermore, Gibbons et al. (1999), who developed the Iowa-

Netherlands Comparison Orientation Measure, reported that the average score for the teenage sample used, was higher (M = 3.10 in the Netherlands and 3.60 in the united states) than the average score from the current study. This therefore suggests that young girls do not compare themselves to others to the extent that teenage girls and young women do. Furthermore, this provides an explanation for why the hypotheses in the current study were not supported.

In addition to this, research also suggests that social comparisons are presented in two forms, regarding self-improvement or self-evaluation, and that the nature of the social comparisons an individual engages in, can influence whether body satisfaction is affected negatively or positively (Halliwell & Dittmar, 2005). Knobloch-Westerwick (2014) supported this by conducting a study in which young women were presented with a series of idealised media images, across five days. This study found that greater self-improvement social comparisons increased body satisfaction, whereas, greater self-evaluation social comparisons led to a reduction in body satisfaction. This suggests that the effects of idealised media exposure on body satisfaction is dependent upon the nature of the social comparisons that particular individual engages in. Therefore, it may be the case that the overall sample used in Kleemans' et al. (2016) study happened to endorse greater self-evaluation social comparisons, leading to significantly lower body satisfaction, following idealised photo exposure. Whereas, in the current study, the overall sample may have engaged in self-improvement social comparisons, which may explain the non-significant findings. In addition to this, it may also be possible that teenage girls are more likely to engage in self-evaluation social comparisons, whereas, younger girls are more likely to engage in self-improvement social comparisons. Once again, this may help to explain why photo exposure led to significantly lower body satisfaction in Kleemans' et al. (2016) study, but not in the current study. Therefore, further research needs to be conducted to test whether there is a difference between young girls and teenage girls, in regard to social comparison motives (self-improvement/self-evaluation), as well as the frequency of comparisons.

The strengths of the current study include the use of appropriate methods to test the hypotheses. Kleemans et al. (2016) did not measure body satisfaction prior to the induction, therefore, the current study improved upon this limitation by including a

baseline measure of body satisfaction, in order to appropriately measure the change in body satisfaction as a consequence of the induction. The current study also explored within group differences as well as between groups differences of social comparison scores, by exploring the continuum of scores and identifying differences in relationships, which once again improved upon the limitations of the study by Kleemans et al. (2016).

However, the current study also had limitations. One of which is that the sample of participants were largely from a middle-class background, due to recruitment taking place in middle-class schools and private dance schools. Therefore, on average participants were active and healthy, meaning they may not have represented young girls at the population level. Another limitation may be that the cover story used was not sufficient for preventing the participants from guessing the true purpose of the study. Participants were told that the study was investigating how facial expressions and body language are perceived in photos posted on social media, and that they would be shown a series of Instagram photos. However, prior to this induction, participants were asked to fill out questionnaires that were specifically related to social comparisons and body satisfaction. Therefore, demand characteristics may have played a role in the comparisons that the participants made towards these photos. Research into demand characteristics suggests that participants are more likely to make upwards comparisons when the true purpose of the study is more obvious (Mills, Polivy, Herman & Tiggemann, 2002). Therefore, if participants were able to guess the true purpose of the study after filling out the questionnaires, (prior to viewing the photos), this may have influenced how they compared themselves to the photos, and how they answered the questionnaire after the induction.

Based on the limitations of the current study, future research should be conducted with children from lower SES schools, where childhood obesity rates are higher (Lieb, 2009; O'Dea, 2014; Pereira, 2018), in order to represent a larger majority of young girls, rather than a minority of healthy and well-educated children. Future research should also try to avoid demand characteristics, in order to prevent the true purpose of the study from influencing the findings (Mills et al., 2002). This could be done by asking participants at the end of the study what they believe the purpose of the study to be, to explore how successful the cover story has been.

To conclude, the current study aimed to investigate how social comparison tendencies predict changes in body satisfaction for participants exposed to edited photos, compared to participants exposed to unedited photos, whilst controlling the effects of age. The findings revealed that social comparison tendencies did not significantly predict changes in body satisfaction, and photo manipulation did not significantly affect the relationship between social comparison tendencies and changes in body satisfaction. These non-significant findings not only highlight the importance of further research, but also have important implications. The findings have furthered the current knowledge within this research area, as the findings suggest that exposure to Instagram photos does not significantly affect the body satisfaction of young girls. This contrasts with the findings for teenage girls, which may be due to teenage girls comparing themselves to others in a different way or to a greater extent than young girls do. Therefore, education regarding the idealised nature of Instagram photos, as well as the negative effects that exposure to these photos can have on body satisfaction, needs to be specifically targeted at females during their transition from childhood to adolescence, as this may be a vulnerable period in which social comparisons become more frequent and negative. Receiving appropriate education at this critical time may then help to reduce the negative effects of exposure to idealised Instagram photos on body satisfaction when females reach their teenage years.

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