

1 To cite this manuscript: Pink, A. E., Lim, P. X., Sim, A. Y., & Cheon, B. K. (2022). The  
2 Effects of Acute Social Media Exposure on Body Dissatisfaction and Eating Behavior of  
3 Male and Female Students. *Journal of Social and Clinical Psychology*, 41(4), 365-397.

4 <https://doi.org/10.1521/jscp.2022.41.4.365>

5 <https://guilfordjournals.com/doi/abs/10.1521/jscp.2022.41.4.365>

6

7

ACCEPTED

8 **The effects of acute social media exposure on body dissatisfaction and eating behavior of**  
9 **male and female students**

10  
11 **Aimee E. Pink<sup>a,d</sup>, Phoebe X. H. Lim<sup>a</sup>, Aaron Y. Sim<sup>a</sup> & Bobby K. Cheon<sup>e\*</sup>**

12 <sup>a</sup>School of Social Sciences, Nanyang Technological University, 639818, Singapore. <sup>b</sup>School of  
13 Psychology, Swansea University, Swansea, SA2 8PP, UK. <sup>c</sup>Social Cognitive Computing,  
14 Institute of High-Performance Computing, A\*STAR, 138632, Singapore. <sup>d</sup>Singapore Institute for  
15 Clinical Sciences, A\*STAR, 117599, Singapore, <sup>e</sup>*Eunice Kennedy Shriver* National Institute for  
16 Child Health and Human Development, National Institutes of Health, Bethesda, Maryland, USA,  
17 20847

18 [AEP: [pinkae@ihpc.a-star.edu.sg](mailto:pinkae@ihpc.a-star.edu.sg) – 0000-0003-1516-7922; PXHL: 0000-0002-1149-9017; BKC:  
19 [bobby.cheon@nih.gov](mailto:bobby.cheon@nih.gov) – 0000-0001-6815-619X]

20 **Corresponding author:**

21 **Bobby K. Cheon**

22 *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD)

23 National Institutes of Health (NIH)

24 6710B Rockledge Dr., Room 3241A, Bethesda, MD 20817

25 Email: [bobby.cheon@nih.gov](mailto:bobby.cheon@nih.gov)

26  
27 **Funding:** This research was supported by Nanyang Technological University Nanyang Assistant  
28 Professorship (NAP) grant (M4081643) and by Ministry of Education Academic Research Fund  
29 Tier 1 Grant (2018-T1-002-024). BKC's contribution to this work was supported by the Intramural  
30 Research Program of the *Eunice Kennedy Shriver* National Institute of Child Health and Human  
31 Development. Nanyang Technological University, A\*STAR and the Ministry of Education had no  
32 role in the design, analysis or writing of this article. Any opinions, findings, and conclusions or  
33 recommendations expressed in this material are those of the author(s) and do not reflect the views  
34 of the A\*STAR.

35 **Competing interest:** The authors declare no competing interests.

36 **CReDiT Author Statement:** Conceptualization – AEP, AYS, BKC; Methodology – AEP, AYS,  
37 BKC; Formal Analysis – AEP, PXHL, AYS; Investigation – AEP, PXHL; Data Curation – AEP,  
38 PXHL; Writing – Original Draft – AEP, PXHL; Writing – Review and Editing – AEP, PXHL,  
39 BKC; Supervision – AEP, BKC; Project Administration – AEP; Funding Acquisition – BKC.

41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51

### **Acknowledgments**

The authors would like to thank Tiffany Lim for her assistance with preparation, data collection and preliminary analysis of Study 1, and Cecilia Zhao Lingxin, Ng Ying Ying and Cassie Danz for their assistance with preparation of stimuli, data collection and curation of data for Study 2, and Lee Li Ling for her assistance with project management in Study 1 and 2. We would also like to thank Ciaran Forde and Edwina Chia for preparation of the computerized portion selection task stimuli and Rochelle Embling for preparation of the height and weight question.

ACCEPTED

## 52 **Abstract**

53 *Introduction:* Experimental research has examined the effect of social media on body  
54 dissatisfaction, but little attention has been given to the impact on eating behavior. Across two  
55 studies, we tested the causal relationship between acute social media use, body dissatisfaction and  
56 eating behavior. *Methods:* In Study 1, 80 female participants (age:  $M=20.75$  years; BMI:  $M=21.3$ )  
57 viewed their own Facebook account or a news website before completing a portion size selection  
58 task. In Study 2 (pre-registered), 148 participants (81 females; age:  $M=20.92$  years; BMI:  
59  $M=22.19$ ), viewed their own or an experimenter-curated Instagram profile before consuming  
60 potato chips ad-libitum. *Results:* In Study 1, body dissatisfaction was significantly higher in  
61 participants who viewed Facebook (compared to a news website) and significantly mediated the  
62 effect of condition on portion size selection. In Study 2, regardless of condition females reported  
63 significantly smaller ideal body sizes and higher body dissatisfaction compared to males. When  
64 females reported a thinner body size as ideal, females in the personal Instagram consumed  
65 significantly less potato chips than those in the control Instagram condition. When males reported  
66 a smaller actual body size, males in the personal Instagram condition consumed significantly less  
67 potato chips than males in the control Instagram condition. *Discussion:* Findings suggest brief  
68 bouts of social media use may produce immediate disruptions to body image of both sexes, and  
69 restrained snack intake of females endorsing thin ideals.

70 **Keywords:** Body Image, Body Dissatisfaction, Social Media Use, Eating Behaviors, Portion  
71 Size

72

## 1. Introduction

73

74 Prior research has suggested the negative impact of social media on body image (Fardouly  
75 & Vartanian, 2016; Saiphoo & Vahedi, 2019). This has included reports of internal research from  
76 Meta (formerly Facebook) showing that Instagram (a photo sharing platform that is a core Meta  
77 product) is harmful to mental health and body image due to social comparisons that influence how  
78 women view and describe themselves (Wells, Horwitz, & Seetharaman, 2021). The report  
79 highlighted the platform's influence on vulnerable individuals, such as younger users and how  
80 individuals with mental health conditions report feeling worse after using the platform. Broader  
81 reviews also show greater body image concerns have been linked to social media use, which are  
82 exacerbated by appearance-focused social media especially among younger age users (Saiphoo &  
83 Vahedi, 2019).

84 A wealth of correlational studies emphasize the relationship between social media and  
85 body dissatisfaction (Bennett et al., 2020; Griffiths, Murray, Krug, & McLean, 2018; Lee & Lee,  
86 2021; McLean, Paxton, Wertheim, & Masters, 2015; Modica, 2020; Saunders & Eaton, 2018;  
87 Stronge et al., 2015). In particular, image based social media (e.g., Facebook and Instagram) has  
88 been associated with poor body image and negative affect. For example, experimental studies  
89 suggest that viewing images of thin and attractive individuals (commonly seen on social media  
90 sites) can lead to increased body dissatisfaction and negative mood (Fardouly & Holland, 2018;  
91 Livingston, Holland, & Fardouly, 2020; Tiggemann & Anderberg, 2020; Tiggemann, Hayden,  
92 Brown, & Veldhuis, 2018). Tiggemann and colleagues (2018) found individuals reported  
93 increased body and facial dissatisfaction if they had viewed thin-ideal images compared to average  
94 weight images (presented in an Instagram format), and Tiggemann and Anderberg (2020) found  
95 greater body dissatisfaction and lesser body appreciation reported by individuals who only viewed  
96 the 'ideal' images from 'Instagram vs reality' posts. It is likely that upward comparisons (i.e.,  
97 comparing oneself with those deemed more superior) may be a cause. For example, Hogue and  
98 Mills (2019) found increased negative body image in females after browsing and commenting on  
99 a Facebook profile for an attractive female peer compared to females who completed the same task  
100 targeting a female family member. Levels of comparison (both high and low) have shown to be  
101 similar across genders (Gomez et al., 2021). Consequently, the current studies focus on social  
102 media that is primarily image based.

103           Body dissatisfaction is a key maintenance factor for eating disorders (Stice, 2002). Prior  
104 research has also shown associations between social media use, body dissatisfaction and  
105 disordered eating behaviors (Holland & Tiggemann, 2016; Saiphoo & Vahedi, 2019). A range of  
106 social media indices (i.e., frequency of use, time spent on social media, number of friends) are  
107 associated with body image concerns and disordered eating behaviors according to several reviews  
108 (Holland & Tiggemann, 2016; Ioannidis et al., 2021; Rounsefell et al., 2020; Ryding & Kuss,  
109 2020). Examples of specific associations include (a) higher negative social media engagement and  
110 greater body dissatisfaction and disordered food choices (Rounsefell et al., 2020), (b) increased  
111 thoughts of dieting in individuals who make upward comparisons (comparing oneself to others  
112 ‘better’ off (Gibbons, 1986) after comparing themselves to social media images (Fardouly, Pinkus,  
113 & Vartanian, 2017) and (c) increased feelings of hunger and distraction from pursuing healthy  
114 eating goals after viewing images of food (Vaterlaus, Patten, Roche, & Young, 2015). Despite a  
115 plethora of association studies and experimental studies with disordered eating behavior as the  
116 outcome (see reviews Holland & Tiggemann, 2016; Ioannidis et al., 2021), to date there are limited  
117 experimental studies that examine the potential causal impact of exposure to social media on  
118 subsequent eating behaviors (i.e., food intake and portion size). Here, we advanced previous  
119 findings by experimentally examining the impact of social media on body image and eating  
120 behaviors using portion size selection and snack intake tasks.

121           There are several possible mechanisms in which social media may affect subsequent  
122 portion selection patterns and eating behavior. Firstly, individuals may alter what they eat based  
123 on their perceptions of what social media users do and should eat. For example, Hawkins and  
124 colleagues (2020) found fruit and vegetable intake was significantly predicted by perception of  
125 Facebook users’ intake whilst high energy dense snack consumption was predicted by perceptions  
126 of what users should eat. Secondly, exposure to peers’ meticulously curated social media posts  
127 that largely present their desirable experiences, traits (e.g., best looking pictures of oneself), and  
128 affirmations of support from others may produce feelings of relative disadvantage among viewers.  
129 Indeed, the concept of ‘fear of missing out’ (FOMO) which is defined as the state of anxiety over  
130 being absent from rewarding experiences that others are having, has been associated with poor-  
131 wellbeing and depression (Hunt, Marx, Lipson, & Young, 2018). Perceptions of ‘falling behind’  
132 others can increase an individual's desire to select and consume larger portion sizes (Sim, Lim,  
133 Forde, & Cheon, 2018). Therefore, feeling like one is missing out and associated feelings linked

134 to emotional eating may lead to increase food consumption (Cheon, Lim, McCrickerd, Zaihan, &  
135 Forde, 2018; Cheon & Hong, 2017; Sim, Lim, Leow, & Cheon, 2018).

136 Yet, it is also possible that social media use may subsequently reduce or restrain food  
137 intake. Disturbances to body image and eating behavior following social media use may be a  
138 product of specific types of social media content, such as selectively curated images that make  
139 peers seem especially physically attractive (e.g. enhanced or modified ‘selfies’; Cohen, Newton-  
140 John, & Slater, 2018). Although broader upward social comparison with others on social/economic  
141 resources may stimulate appetite (Cheon & Hong, 2017; Sim, Lim, Forde, et al., 2018), it is also  
142 possible that domain specific upward comparisons on physical appearance may selectively lead to  
143 intentions to restrict food intake to reduce perceived discrepancies in body size/appearance with  
144 others.

145

#### 146 *Current Studies*

147 The current studies aimed to take initial steps in establishing a causal link between social  
148 media, body dissatisfaction and eating behavior. The overarching aim was to experimentally  
149 examine the influence of social media on body image (aim 1) and eating behaviors (aim 2),  
150 specifically portion size and food intake. We first predicted that a brief exposure to naturalistic  
151 social media usage (i.e., browsing one’s account for less than 10 minutes) will be associated with  
152 greater body dissatisfaction (H1) and desire to consume less food (H2), in other words reduced  
153 portion size selection and snack intake, compared to using other types of digital media (e.g.,  
154 browsing daily news). We also examined factors that may mediate the relationship between social  
155 media exposure and eating behaviors (aim 3). We hypothesized that increased body dissatisfaction  
156 would significantly mediate the relationship between social media exposure and eating behavior  
157 (H3). Individuals that viewed social media were hypothesized to experience an increase in body  
158 dissatisfaction and in turn, reduce their portion size selection or food intake. Study 1 and 2  
159 examined these behaviors in the context of Facebook and Instagram use on the influence of portion  
160 size and actual food intake, respectively.

161 Individuals often use Facebook and Instagram by scrolling through “feeds” compiled of  
162 the latest posts. In these “feeds” individuals are exposed to a range of posts including idealized  
163 images and descriptions of the poster’s life. Compared to previous studies, the current study was  
164 designed to capture and examine the impact of a more naturalistic use of social media. Specifically,

165 participants either browsed the “feed” of their own social media account versus an online  
166 newspaper (study 1), or the “feed” of a researcher curated social media account (study 2). This  
167 provided more realistic engagement with social media (e.g., being able to scroll through various  
168 images).

169

170

## 2. Study 1

171 Study 1 addressed the overall aims by experimentally investigating the immediate effect of  
172 viewing Facebook on body image and subsequent portion size selection in comparison to viewing  
173 a local online news website. We hypothesized that participants who spent time viewing their own  
174 Facebook account would report higher body dissatisfaction (H1) and as a result choose smaller  
175 portions (H2). Furthermore, we hypothesized body dissatisfaction would mediate the relationship  
176 between Facebook use and the choice of portion size (H3). Study 1 utilized a portion selection task  
177 as this method has been shown to be sensitive and highly predictive of what people eat and  
178 therefore the task is a suitable proxy for people’s actual food intake across a diverse range of foods  
179 (Wilkinson et al., 2012).

180

### 2.1. Study 1 Materials and Methods

#### 2.1.1. Participants

183 Eighty-nine female Singaporean undergraduate students were initially recruited, with 9  
184 participants subsequently excluded after reporting that they did not check their Facebook account  
185 daily (pre-determined eligibility criteria). As higher rates of body dissatisfaction and disordered  
186 eating are reported in females (Griffiths et al., 2016; van den Berg et al., 2007), only female  
187 participants were recruited in Study 1. A final sample of 80 participants (age:  $M=20.75$  years,  
188  $SD=1.75$ , range=18-25 years; BMI:  $M=21.30$ ,  $SD=3.23$ ) were randomly assigned to either browse  
189 their own Facebook account ( $n=41$ ) or an online local Newspaper (The Strait Times;  $n=39$ ). The  
190 authors note Study 1 is under powered for small effect sizes, however, post-hoc power analysis  
191 revealed we had an average of 80% power for our significant analyses. Participants were recruited  
192 with the expectation of participating in a study on social media attitudes and eating behaviors,  
193 including internet browsing patterns, and received one research course credit for their  
194 participation.

195



### 196 2.1.2. Measures

197 *Participant Characteristics.* Participants were asked to provide their sex, age, nationality,  
198 and ethnicity. In addition, participants completed an adapted version of the *Facebook Use*  
199 *Questionnaire* (6-items;  $\alpha=.81$ ; Ross et al., 2009) as an assessment of their attitude towards the use  
200 of Facebook. The Facebook Use Questionnaire asks participants to what extent do they agree with  
201 a statement on a five-point scale ( $1=strongly\ disagree$  to  $5=strongly\ agree$ ). Participants were also  
202 asked to estimate how long they spent on social media, and specifically, Facebook, and how many  
203 friends they had on Facebook (participants could look this up if needed). Finally, weight and height  
204 were measured using a digital scale and stadiometer respectively to calculate body mass index  
205 ( $\text{kg}/\text{m}^2$ ).

206 *Hunger Assessment* (Friedman, Ulrich, & Mattes, 1999). The HA asks participants to  
207 indicate on a 100-point visual analogue scale (VAS) their current hunger level, desire to eat, how  
208 full they are and how much they feel they could eat at that moment. A composite hunger score was  
209 calculated (fullness item reversed;  $\alpha=.96$ ). The hunger assessment was included to control for  
210 hunger levels across groups.

211 *Three Factor Eating Questionnaire-Revised-21* (TFEQ-R21; Cappelleri et al., 2009). The  
212 TFEQ-R21 is a self-assessment measure of three behavioral and cognitive domains of eating  
213 behavior. Cognitive restraint (CR; intentional control of food intake to maintain or reduce body  
214 weight/size;  $\alpha=.80$ ), uncontrollable eating (UE; overeating because of a lack of control over food  
215 intake;  $\alpha=.83$ ) and emotional eating (EE; consumption of more food in response to negative  
216 emotions;  $\alpha=.90$ ) and was included to describe the characteristics of the sample. Participants  
217 responded by selecting the response that best describes them on a four-point Likert type scale  
218 ( $1=definitely\ false$  to  $4=definitely\ true$ ). A single eight-point scale was re-coded as 1-4 and items  
219 1-16 were reversed scored to calculate the mean of all items where higher scores were indicative  
220 of greater CR, UE, and EE.

221 *Positive Affect and Negative Affect Scale* (PANAS; Watson, Clark, & Tellegen, 1988). The  
222 PANAS consists of ten positive ( $\alpha=.90$ ) and ten negative ( $\alpha=.92$ ) adjectives which are summed  
223 separately to reflect a participant's general affect. Participants were asked to rate on a five-point  
224 scale ( $1=very\ slightly/not\ at\ all$  to  $5=extremely$ ) how they feel *right now* and higher scores indicate  
225 greater levels of affect.

226 *Modified Contour Drawing Figure Rating Scale* (CDFRS; Swami et al., 2010). The  
227 CDFRS is a series of different sized front-view line-drawings of female bodies ( $I=smallest$  to  
228  $9=largest$ ). The measure has been validated across 26 countries, including Singapore by Swami  
229 and colleagues (2010). Participants were asked to select the line-drawing that best represented the  
230 following: (a) their actual body, (b) their ideal body, (c) the average body among the female  
231 undergraduate population and (d) the average female body that would be idealized by males. To  
232 assess discrepancies across body image perceptions, (b), (c) and (d) were all subtracted for (a)  
233 respectively. Scores indicated both the magnitude and direction (i.e., scores could be positive or  
234 negative) of the body dissatisfaction. Using ideal body image as an example, negative scores  
235 represented ideal scores being greater than actual scores, therefore indicating the participant  
236 viewed their body as smaller than ideal (referred to as body dissatisfaction larger). On the other  
237 hand, positive scores represented ideal scores being smaller than actual scores, therefore indicating  
238 the participant viewed their body as larger than ideal (referred to as body dissatisfaction smaller).

239 *Portion Selection Task*. Participants completed a modified version of the portion selection  
240 task reported by Wilkinson et al. (2012). Ten foods commonly consumed in Singapore were used  
241 to ensure the task was relevant to the current sample (e.g., beef rending, fried carrot cake).  
242 Participants were asked to choose the portion size of each food item that most represented the ideal  
243 portion they would serve themselves for their next meal. Portion size increased/decreased in each  
244 image by 20 calories (ranging from 20 to 1000 calories for each food item) and participants were  
245 able to incrementally increase/decrease the portion size by using the right and left arrow keys.  
246 Calories selected across the ten food items were averaged to create an overall ideal portion size (in  
247 kcal;  $\alpha=.89$ ). Participants were also asked food-related characteristics questions, for example, how  
248 much they liked each food, how filling they thought it was, how much they wanted it, how many  
249 calories that thought it contained and how often they ate the foods.

250

251

252 Figure 1. Example of a food item (Yang Chow Fried Rice) presented in the portion size selection  
253 task. All foods were presented in a series of 50 images that depicted incremental changes in portion  
254 sizes of the food in 20kcal increments (ranging from 20 to 1000 kcal).

255

256 *Personal Relative Deprivation Scale* (PRDS; Callan, Ellard, & Hodgins, 2008). The PRDS  
257 is a 4-item self-report measure to assess an individual's belief/feeling they are worse off than others

258 by capturing their general perceptions of personal relative deprivation associated with comparing  
259 their outcomes with the outcomes of others. Participants respond by selecting the answer that best  
260 describes them on a seven-point scale (-3=*strongly disagree* to 3=*strongly agree*). Two items are  
261 reverse scored, and an average score is calculated with higher scores indicating greater personal  
262 relative deprivation ( $\alpha=.70$ ).

263

### 264 **2.1.3. Procedure**

265 The study was approved by the University's Institutional Review Board. On arrival,  
266 participants were handed an information sheet and informed consent was obtained. Participants  
267 completed the hunger assessment and the Three Factor Eating Questionnaire via an online survey  
268 platform (Qualtrics). Following this, participants were randomly assigned to browse either their  
269 own personal Facebook home "feed" or an online local newspaper (The Strait Times) for seven  
270 minutes and were provided links to access the sites from the survey. They were verbally reminded  
271 to passively browse the websites as they normally would, with the exception that they could not  
272 post comments or messages. After seven minutes, participants were asked to return to the online  
273 survey where they were asked to list the three things that stood out most from their browsing. They  
274 then completed the Positive Affect and Negative Affect Scale and Contour Drawing Figure Rating  
275 Scale. Participants then completed the portion selection task, food-related characteristics,  
276 Perceived Relative Deprivation, demographics, and Facebook Use Questionnaire. Before leaving,  
277 participants had their height and weight measured and were debriefed. Participants also completed  
278 a Fat-Thin Implicit Association Test (Teachman & Brownell, 2001) and Crandall's Anti-Fat  
279 Attitudes Questionnaire (Crandall, 1994) during the session. These measures were included to  
280 examine whether social media exposure may influence anti-fat attitudes independent of, or in  
281 addition to body image (see supplementary materials for measure summary and results).

282

### 283 **2.1.4. Statistical Analysis**

284 Statistical analysis was conducted using SPSS v26 (IBM). We conducted descriptive  
285 statistics to characterize the sample and a t-test to analysis perceived relative deprivation. To test  
286 the effect of exposure on body image and dissatisfaction (discrepancy scores for ideal, average and  
287 attractive) we conducted a series of ANCOVAs whilst controlling for BMI. We adopted the  $p$   
288 value of .02 ( $p=.05/3$ ) to adjust for multiple comparisons grouping by construct (e.g., body image,

body dissatisfaction and portion size). A mediation analysis was conducted using PROCESS (v4.0) Model 4 (Hayes, 2018) entering condition (control=0, Facebook=1) as the predictor and portion size selection as the outcome with body dissatisfaction as the mediator, whilst controlling for BMI and baseline hunger. BMI was controlled for in analyses to examine the relationship between social media use and body dissatisfaction independent of a participant's weight and the associations between BMI and portion size.

## 2.2. Study 1 Results

### 2.2.1. Participant Characteristics

On average participants reported they spent 1-2 hours on social media a day of which 10-30 minutes was spent on Facebook. There was a wide range of scores on the Facebook Use Questionnaire attitudes subscale ( $M=18.03$ ,  $SD=4.16$ , range=7-29) and the average number of Facebook friends was 535.58 ( $SD=566.27$ , range=40-4000). Average scores for the Three Factor Eating Questionnaire and Perceived Relative Deprivation Scales were comparable across the two conditions (see Table 1).

### 2.2.2. Body Image

Results found a significant difference across type of exposure, whereby participants in the Facebook condition rated their actual body size as larger than the control condition, see Table 1. There was a significant main effect of condition on the perception of how much their actual size differed from ideal body size, how much their body differed from normative female size, and on the difference between actual body size and perceived male ideals, see Table 1. Each time participants in the Facebook condition had a significantly greater difference between the two scores, see Table 1. When adopting the adjusted  $p$  value, only the differences in actual body image and the discrepancy between actual and average and attractive remained significant.

Table 1. Mean and standard deviations of ratings for outcome variables across conditions.

	Facebook ( $n=41$ )		Control ( $n=39$ )		$F$	Sig.	
	$M$	$SD$	$M$	$SD$		$p$	$\eta_p^2$
Actual Body <sup>1^</sup>	5.49	1.49	4.41	1.48	9.36	.003*	.108
Ideal Body <sup>^</sup>	3.32	.96	3.21	.77	9.21	.969	.000
Actual – Ideal Body <sup>2^</sup>	2.17	1.39	1.21	1.64	5.12	.026	.062
Average Body <sup>^</sup>	3.76	1.34	3.92	.87	.20	.654	.003

Actual – Average Body <sup>3^</sup>	1.73	1.70	.49	1.94	6.80	.011*	.081
Males Ideal <sup>^</sup>	2.93	.82	3.03	.74	.50	.480	.007
Actual – Males Ideal <sup>4^</sup>	2.56	1.73	1.38	1.55	7.50	.008*	.089
Portion Size <sup>5^^</sup>	270.44	78.09	325.49	159.10	3.34	.071	.042
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>	<i>d</i>
BMI	21.87	3.35	20.70	3.03		.104	.366
Cog. Res.	15.02	3.66	14.01	3.51	1.15	.255	.281
Uncon. Eat.	20.88	4.37	21.62	4.79	.72	.474	.161
Emo. Eat.	13.59	4.21	12.74	4.08	.91	.367	.205
Rel. Dep.	3.16	1.08	2.88	.96	1.26	.212	.274

316 \*denotes significant to the adjusted  $p \leq .02$ . Cog. Res.=cognitive restraint, Uncon.  
 317 Eat.=uncontrollable eating, Emo. Eat=emotional eating, Rel. Dep.=relative deprivation.  
 318 <sup>1</sup>Represents their actual body size, <sup>2</sup>difference between actual body size and ideal body size,  
 319 <sup>3</sup>difference between actual body size and average female undergraduate body size, <sup>4</sup>difference  
 320 between actual body size and perceived male's ideal female body size, <sup>5</sup>portion size selection in  
 321 kcal. <sup>^</sup>ANCOVA controlling for BMI, <sup>^^</sup>ANCOVA controlling for BMI and baseline hunger.

322

### 323 2.2.3. Portion Size Selection Task

324 Homogeneity of variance was violated but as there is no non-parametric equivalent, an  
 325 ANCOVA was conducted, controlling for BMI and baseline appetite, to examine the effect of type  
 326 of exposure on portion size selection<sup>1</sup>. No significant difference was found between the two  
 327 conditions on average portion size in kcal, see Table 1.

328

### 329 2.2.4. Mediation Analysis

330 The direct effect ( $b=-29.09$ ,  $SE=27.49$ ,  $p=.293$ ) was not significant. Condition was a  
 331 significant predictor of body dissatisfaction,  $b=.65$ ,  $SE=.28$ ,  $p=.025$ , 95% CI [.08, 1.21] and body  
 332 dissatisfaction was a significant predictor of portion size selection ( $b$ ),  $b=-.34.56$ ,  $SE=10.75$ ,  
 333  $p=.002$ ,  $CI_{95}$  [-55.98,-13.15]. Body dissatisfaction also significantly mediated the relationship  
 334 between condition and portion size selection ( $b=-22.44$ ,  $SE=13.91$ ,  $CI_{95}$  [-54.72,-1.97]; see Figure  
 335 2). The coefficients show that relative to participants in the control condition, participants in the  
 336 Facebook condition had greater body dissatisfaction, which in turn predicted smaller portion sizes.

337

<sup>1</sup>A Mann-Whitney U test also revealed no significant difference in average portion size across the two conditions ( $U=2591.50$ ,  $p=.575$ ).

338 Figure 2. Mediation model of condition on portion size including body dissatisfaction as a  
339 mediator. Unstandardized coefficients are shown for each path and the total effect (in parentheses).  
340 \* indicates significance,  $p < .05$ .

341

### 342 **2.3. Study 1 Discussion**

343 Study 1 demonstrated that viewing one's own Facebook account rather than an online news  
344 site can result in poorer body image, largely driven by increased perceptions of one's actual body  
345 as being larger (H1 supported). As there was no difference between conditions on ideal body size,  
346 this suggests that viewing Facebook may lead to greater body dissatisfaction by making people  
347 "feel fat" rather than making them adopt more unrealistic ideal body ideals. Portion sizes did not  
348 significantly differ across conditions (H2 not supported); however, body dissatisfaction did  
349 significantly mediate the effect of condition on portion sizes (H3 supported). This suggests that  
350 viewing Facebook leads to increased body dissatisfaction which in turn leads to a desire to  
351 consume smaller portions. The consumption of smaller portions could be a weight management  
352 behavior to reduce calorie intake in a bid to lose weight and alleviate body dissatisfaction.

353 Study 1 provides initial support for causal relationship between social media use, body  
354 dissatisfaction and eating behavior, however it remains unknown whether there is an influence on  
355 actual food intake. One limitation to Study 1 is the small sample size. A second limitation is that  
356 we focused on one social media platform and others need to be considered. Whilst Facebook is the  
357 most popular social media platform generally, the use of Instagram is growing, especially amongst  
358 younger adults (Clement, 2020). Given its primary focus on posting and sharing images, Instagram  
359 may lead to greater tendency to make comparisons (compared to using Facebook; (Engeln, Loach,  
360 Imundo, & Zola, 2020). Study 2 sought to address these limitations and replicate findings of Study  
361 1.

362

363

## 364 **3. Study 2**

365

366 Study 2 further addressed the overall aims by experimentally examining the immediate  
367 effect of viewing one's personal Instagram account on body dissatisfaction and ad-libitum  
368 snacking. Instagram is a unique social media platform which focuses on sharing photos and videos  
and allows users to edit and filter their images. Notably, photo-based activities are specifically

369 related to increased body dissatisfaction and disordered eating (Cohen et al., 2018; Meier & Gray,  
370 2014). As previous studies of social media and body image have predominantly focused on  
371 females, Study 2 also aimed to take initial steps to examine the influence of social media on males.  
372 Initial data collection for Study 2 had previously been underway but we did not reach the desired  
373 samples size (*a-priori* power analysis) before disruptions due to COVID-19 restrictions. Given the  
374 possible changes in personal social media accounts during the global pandemic and the delay in  
375 restarting data collection, we opted to start the study afresh. We conducted preliminary analysis  
376 on the previously conducted data and pre-registered our hypotheses (<https://osf.io/a8b52>) for the  
377 current dataset. Study 2 was adequately powered and sought to confirm our initial findings from  
378 Study 1.

379 We predicted that participants who viewed their personal Instagram account (compared to  
380 control Instagram content) would report significantly increased body dissatisfaction (H1) and  
381 consume less potato chips (H2). Furthermore, females would report significantly more body  
382 dissatisfaction than males (H1a) and would consume significantly less potato chips than males  
383 (H2a). We also predicted sex by condition interaction on body dissatisfaction (H1b), such that in  
384 the personal Instagram condition, females would report their ideal body size as smaller than their  
385 actual whereas males will report their ideal boy size as bigger than their actual. This prediction  
386 was informed by our preliminary analysis of the initial round of data collection. Likewise, we  
387 predicted a significant sex by condition interaction (H2b). Males in the personal Instagram  
388 condition would consume significantly more than males in the control Instagram condition and  
389 females in the personal Instagram condition would consume significantly less than those in the  
390 control Instagram condition. These predictions are made based on the research available that  
391 suggests males and females respond differently to media images. For example, Harrison and  
392 colleagues (2006) found reduced snack intake in females who reported high-discrepancy (mis-  
393 match between actual and ideal body image) after viewing ideal-body images (from magazines)  
394 whereas males increased snack intake. Finally, we predicted that body dissatisfaction would  
395 significantly mediate the effect of condition on snack intake (H3). Participants in the personal  
396 Instagram condition would report greater body dissatisfaction and in turn consume less potato  
397 chips.

398

### 399 **3.1. Study 2 Materials and Methods**

### 400 3.1.1. Participants

401 The study was advertised as research investigating the relationship between social media  
402 use, everyday habits, and activities. Participants received either S\$5 or 1 research participation  
403 credit for completion of the study. Eligibility for the study included being aged 18-65 years old<sup>2</sup>,  
404 having an active personal Instagram account which they check at least once a day and having no  
405 known food allergies. Power analysis using G\*Power 3.1 revealed 128 participants were required  
406 to obtain a medium effect size ( $d=.25$  with 80% power, standard  $\alpha=.05$ , numerator=1,  
407 groups=4) for an ANCOVA with two covariates.<sup>3</sup> Recommendations for mediation analysis  
408 suggest a sample size of 71 for medium (.39) alpha and beta paths (Fritz & MacKinnon, 2007).  
409 Based on standardized coefficients from study 1 ( $\alpha=.41$ ,  $\beta=-.43$ ) we consider the above sample to  
410 be sufficient for mediation analysis as well. We aimed to collect >32 participants per condition to  
411 allow for technical errors with data recording or missing data.

412 One hundred and seventy-one participants were initially recruited, with 23 subsequently  
413 removed for reasons such as technical/recording errors ( $n=5$ ), guessing the aims/hypotheses ( $n=7$ ),  
414 and engaging in behaviors not consistent with the instructions ( $n=11$ ). Our final sample included  
415 81 females (age:  $M=19.51$  years,  $SD=.92$ , range=18-23 years; BMI:  $M=20.83$ ,  $SD=3.45$ ) and 67  
416 males (age:  $M=22.6$  years,  $SD=2.03$ , range=20-32 years; BMI:  $M=23.82$ ,  $SD=3.80$ )<sup>4</sup>. Average self-  
417 reported BMI was 22.07 ( $SD=3.76$ ) and was significantly correlated with researcher measured  
418 BMI ( $N=146$ ,  $r=.98$ ,  $p<.001$ ;  $M=22.14$ ,  $SD=3.90$ )<sup>5</sup>. Participants were randomly assigned to either  
419 browse their personal Instagram account ( $n_{\text{females}}=42$ ;  $n_{\text{males}}=31$ ) or researcher created (control)  
420 Instagram account (@cool\_sciencestuff;  $n_{\text{females}}=39$ ;  $n_{\text{males}}=36$ ) which follows education,  
421 mathematics, and physics account profiles.

422

### 423 3.1.2. Measures

---

<sup>2</sup>Parental consent was obtained for participants under 21 years in line with local age of contractual agreement.

<sup>3</sup>The power analysis reported in in the pre-registration states we aimed to collect 90 males and females for this study. This is incorrect and was based on a total sample of 158.

<sup>4</sup>Assessing both Study 1 and 2 found no significant differences between samples on variables such as BMI ( $p=.093$ ), age ( $p=.758$ ) and baseline appetites ( $p=.768$ ), suggesting relatively similar sample types.

<sup>5</sup>Given the high correlation between self-report and researcher measured BMI, self-report BMI was used for two participants with recording errors.



424 The following measures were collected in line with the descriptions for Study 1 (see section  
425 2.1.2): hunger assessment (pre:  $\alpha=.90$ ; post:  $\alpha=.92$ ), Positive Affect Negative Affect Scale (PA:  
426  $\alpha=.88$ ; NA:  $\alpha=.81$ ) and Three Factor Eating Questionnaire (CR:  $\alpha=.76$ ; UE:  $\alpha=.78$ ; EE:  $\alpha=.89$ ).  
427 Body dissatisfaction was measured and scored as per the Contour Drawing Figure Rating Scale in  
428 2.1.2 with the addition of a male version. Study 2 also included the following measures:

429 *Manipulation Check.* As it was impossible to control the images seen by the participants in  
430 the personal Instagram condition, all participants were asked to indicate what types of images they  
431 saw so a comparison could be made.

432 *Ad-libitum Snack Consumption.* 60g (716.8kcal) from a packet of potato chips (FairPrice  
433 Original Flavor; 75g; 896kcal) was served to participants on a paper plate. To measure snack  
434 consumption, the plates were weighed before and after consumption with the difference in weight  
435 indicating the amount consumed in grams. After consumption, participants were asked appetite  
436 ratings of the potato chips. Specifically, participants were asked “*How much did you enjoy eating*  
437 *the chips?*” and “*How delicious were the chips?*” on a VAS (0=*not at all* to 100=*extremely*) and  
438 these items were averaged to create a composite score, with higher scores indicating a greater  
439 preference for potato chips ( $\alpha=.92$ ). They were also asked their usual frequency of consumption  
440 of potato chips on a seven-point Likert type scale (1=*almost never* to 7=*more than once a day*).

441 *Instagram Use.* This was measured through the researchers’ own questionnaire which  
442 aimed to access to what extent participants compared themselves with others on Instagram (4 items  
443 averaged;  $\alpha=.82$ ; e.g. “*I compare myself to my friends when I judge how attractive I am*) and their  
444 desire to “*look*” like friends and celebrities (2 items;  $\alpha=.59$ ; e.g. “*I want to look like the*  
445 *celebrities/fitness gurus I see on my Instagram page*”). General questions on use were also asked  
446 such as whether Instagram was part of their everyday activity, a preferred social media site and if  
447 they feel out of touch when they are unable to open Instagram (1=*strongly disagree* to 5=*strongly*  
448 *agree*;  $\alpha=.84$ ).

449 In addition, participants also completed the Physical Appearance Comparison Scale-3  
450 (Schaefer, Harriger, Heinberg, Soderberg, & Kevin Thompson, 2017), Compensatory Health  
451 Belief Scale (Knäuper, Rabiau, Cohen, & Patriciu, 2004), Pathogenic Weight Control Practices  
452 (Morrison, Kalin, & Morrison, 2004) and Physical Activity Stages of Change Questionnaire  
453 (Marcus & Forsyth, 2009) for exploratory analyses as part of a different research project. Measure  
454 descriptions and exploratory results presented in the supplementary materials.

455

### 456 **3.1.3. Procedure**

457 The study was approved by the University's Institutional Review Board. On arrival,  
458 participants were handed an information sheet and informed consent was obtained. Participants  
459 verified that they had an Instagram account, estimated their time spent on social media, including  
460 Instagram, and were asked which gender they identify with via an online survey platform  
461 (Qualtrics). Participants indicated their current hunger and were then randomly assigned to browse  
462 either the Instagram "feed" of their personal account or an account curated for the study containing  
463 images of science and technology (@cool\_sciencestuff). They were verbally reminded to passively  
464 browse the "feeds" and to not post comments. After 8-minutes, participants were asked to return  
465 to the online survey where they completed the Positive Affect and Negative Affect scale, and  
466 identify items they saw whilst browsing Instagram. They then completed the Contour Drawing  
467 Figure Rating Scale that matched the gender they identified at the start. Participants were then  
468 presented with potato chips and began watching a short documentary (telescope lenses; 7-minutes),  
469 before they rated their hunger levels, preference for potato chips, and completed the Compensatory  
470 Health Beliefs scale, Three Factor Eating Questionnaire, social media use, and adapted Physical  
471 Appearances Comparison Scale. Finally, participants completed demographic variables such as  
472 age, dieting status and height and weight, and asked what they felt the aim of the study was. Before  
473 leaving, participants had their height and weight measured and were debriefed.

474

### 475 **3.1.4. Statistical Analysis**

476 Whilst we are unable to control what participants see in their home feed it is likely to  
477 consist of a number of different image types (Hu, Manikonda, & Kambhampati, 2014). We  
478 conducted a brief analysis of the types of images recalled by participants in the two conditions and  
479 this was also used as a manipulation check to see if participants images viewed were in line with  
480 expectations.

481 We conducted a series of ANCOVA's to test hypotheses 1 and 2. Firstly, we conducted a  
482 2 (condition: personal Instagram versus control Instagram) x 2 (sex: males versus females)  
483 ANCOVA on actual and ideal body shape/size and body dissatisfaction scores (actual-ideal,  
484 actual-average and actual-attractive) controlling for BMI. Secondly, we conducted a further 2x2  
485 ANCOVA on potato chip intake (in grams) controlling for BMI and current hunger levels. For the

486 ANCOVAs we adopted the  $p$  value of .013 ( $p=.05/4$ ) to adjust for multiple comparisons grouping  
487 by construct (e.g. body image, body dissatisfaction, intake and participant characteristics, i.e.,  
488 comparison tendency, and mood). For hypothesis 3, we conducted a mediation analysis using  
489 PROCESS (V4.0) Model 4 (Hayes, 2018). We entered condition (control Instagram=0, personal  
490 Instagram=1) as the predictor ( $X$ ) and potato chip intake the outcome ( $Y$ ) with body dissatisfaction  
491 as the mediator ( $M$ ), whilst controlling for BMI and current hunger.

492 In addition, we conducted an ANOVA on positive and negative affect after the  
493 manipulation to check for differences in mood. Across all analyses, pairwise comparisons  
494 (Bonferroni) were conducted where appropriate. We also conducted additional exploratory analyses  
495 to help understand the results further (denoted with \*).

## 497 **3.2. Study 2 Results**

### 498 **3.2.1. Participant Characteristics**

499 Most participants (34.5%;  $n=51$ ) reported spending an average of 1-2 hours per day on  
500 social media, of which most (30.4%;  $n=45$ ) reported that 30-60 minutes was spent on Instagram.  
501 Participants reported average levels of frequency of comparison to others seen on Instagram  
502 ( $M=2.43$ ,  $SD=.78$ ). Of those that compared themselves to others on Instagram, participants  
503 generally reported believing that they looked worse than others ( $M=3.84$ ,  $SD=.52$ ) and tended to  
504 feel negative after making the comparisons ( $M=3.36$ ,  $SD=.61$ ). Examining the images seen by  
505 participants in both conditions, the control Instagram condition reported viewing images related to  
506 science/education and technology ( $n=60$ ), with two participants reporting viewing images related  
507 to “engineering” and “telescopes”. Participants in the personal Instagram condition reported  
508 viewing a wider array of images, ranging from “my friends/family” ( $n=58$ ), “celebrities” ( $n=49$ ),  
509 “fitspiration images” ( $n=22$ ) and “food” ( $n=42$ ), which were researcher specified items, to  
510 “politics”, “quotes”, “memes” and “animals”, stated by participants in a free response question.

511 There were no significant differences in cognitive restraint and uncontrolled eating  
512 behaviors across conditions and sex (see Table 2 and supplementary materials). For emotional  
513 eating, scores were significantly higher in females ( $p=.001$ ) as well as in the control Instagram  
514 condition ( $p=.048$ ), but this did not remain significant when applying the adjusted  $p$  value (see  
515 Table 2 and supplementary materials).

### 516 **3.2.2. Affect**

517 There were no significant results for positive affect (sex:  $F(1,144)=2.11, p=.148$ ; condition:  
 518  $F(1,144)=2.43, p=.121$ ; sex\*condition:  $F(1,144)=2.50, p=.116$ ) or negative affect (sex:  
 519  $F(1,144)=.698, p=.405$ ; condition:  $F(1,144)=.752, p=.387$ ; sex\*condition:  $F(1,144)=.27, p=.601$ ),  
 520 see Table 2.

521

### 522 3.2.3. Body Image

523 All means and standard deviations are presented in Table 2. Results for body dissatisfaction  
 524 as calculated by actual-average and actual-attraction are presented in full in the supplementary  
 525 materials.

526 *Actual*: There was no significant main effect of sex  $F(1,143)=.91, p=.343$ , condition  
 527 ( $F(1,143)=4.70, p=.032$ ; adjusted  $p$  value applied) or interaction effect ( $F(1,143)=.17, p=.685$ ).

528 *Ideal\**: There was a significant main effect of sex ( $F(1,143)=116.72, p<.001, \eta_p^2=.449$ ),  
 529 with males reporting a significantly larger body size as being ideal compared to females. There  
 530 was no significant main effect of condition  $F(1,143)=.06, p=.815$ , or interaction effect  
 531 ( $F(1,143)=4.80, p=.030$ ; adjusted  $p$  value applied).

532 *Actual-Ideal*: There was a significant main effect of sex ( $F(1,143)=74.48, p<.001$ ,  
 533  $\eta_p^2=.342$ ), with females reporting significantly higher body image dissatisfaction scores compared  
 534 to males. There no significant main effect of condition ( $F(1,143)=4.46, p=.036$ ; adjusted  $p$  value  
 535 applied), or interaction effect of sex and condition ( $F(1,143)=1.47, p=.227$ ).

536

537 Table 2. Mean and standard deviations of ratings for outcome variables across conditions.

	Personal Instagram			Control Instagram		
	Females ( $n=42$ ) $M (SD)$	Males ( $n=31$ ) $M (SD)$	Total ( $n=73$ ) $M (SD)$	Females ( $n=39$ ) $M (SD)$	Males ( $n=36$ ) $M (SD)$	Total ( $n=75$ ) $M (SD)$
PA	22.76 (6.65)	22.61 (7.95)	22.70 (7.18)	19.13 (5.89)	22.64 (7.58)	20.81 (6.93)
NA	14.12 (5.46)	13.23 (3.51)	13.74 (4.73)	13.21 (3.55)	13.00 (2.39)	13.11 (3.03)
CR	2.50 (.59)	2.32 (.63)	2.42 (.61)	2.49 (.51)	2.45 (.56)	2.47 (.53)
EE	2.23 (.67)	1.76 (.60)	2.03 (.68)	2.36 (.67)	2.08 (.73)	2.23 (.71)
UE	2.31 (.48)	2.15 (.51)	2.25 (.49)	2.35 (.40)	2.28 (.53)	2.32 (.47)

BMI	20.75 (3.46)	24.31 (3.46)	22.26 (3.86)	20.92 (3.47)	23.41 (4.08)	22.11 (3.95)
Actual	4.81 (1.53)	5.87 (1.34)	5.26 (1.54)	5.28 (1.64)	5.86 (1.57)	5.56 (1.62)
Ideal	3.45 (.77)	5.48 (.68)	4.32 (1.25)	3.72 (.89)	5.11 (.89)	4.39 (1.13)
Actual - Ideal	1.36 (1.56)	.39 (1.26)	.95 (1.51)	1.56 (1.48)	.75 (1.42)	1.17 (1.50)
Average	3.90 (1.10)	5.13 (1.20)	4.42 (1.29)	4.15 (.84)	5.19 (1.17)	4.65 (1.13)
Actual - Average	.90 (1.95)	.74 (1.55)	.84 (1.78)	1.13 (1.82)	.67 (1.90)	.91 (1.86)
Attractive	3.43 (.91)	5.00 (1.18)	4.09 (1.29)	3.62 (.96)	4.56 (1.03)	4.07 (1.09)
Actual - Attractive	1.38 (1.87)	.87 (1.80)	1.16 (1.85)	1.67 (1.74)	1.31 (1.74)	1.49 (1.73)
Potato Chip Intake (g)	14.36 (10.69)	18.13 (14.49)	15.96 (12.49)	15.92 (11.18)	18.42 (14.95)	17.12 (13.09)

538 CR=cognitive restraint (TFEQ), EE=emotional eating (TFEQ), UE=uncontrolled eating (TFEQ),  
539 BMI=body mass index.

540

#### 541 3.2.4. Ad-libitum snack intake

542 There was no significant main effect of sex ( $F(1,142)=1.51, p=.222$ ), or condition  
543 ( $F(1,142)=.536, p=.465$ ), nor a significant interaction effect ( $F(1, 142)=.004, p=.952$ ).

544 We conducted a second ANCOVA\* that also controlled for average liking and current  
545 dietary status. There was a significant main effect of sex,  $F(1,139)=5.56, p=.020, \eta_p^2=.08$ , with  
546 males ( $M=18.97, SE=1.35$ ) consuming significantly larger portions than females ( $M =14.50, SE$   
547  $=1.21$ ). There was no significant main effect of condition ( $F(1,139)=.56, p=.454$ ) or interaction  
548 effect ( $F(1,139)=.01, p=.942$ ).

549

#### 550 3.2.5. Mediation analysis

551 There was no significant direct effect of condition on potato chip intake controlling for  
552 body dissatisfaction ( $B=-1.94, SE=1.93, CI_{.95} [-5.76, 1.88]$ ), or indirect effect ( $B=.32, SE=.40, CI_{.95}$   
553  $[-.24, 1.26]$ ) see Figure 3.

554

555 Figure 3. Mediation model of condition on chip intake including body dissatisfaction as a mediator.  
556 Unstandardized coefficients are shown for each path and the total effect (in parentheses).

557

### 558 3.2.6. Exploratory Analyses

559 We conducted a series of exploratory analyses that examined the moderating effect of body  
 560 image and dissatisfaction on potato chip intake<sup>6</sup>. We conducted separate models for males and  
 561 females (due to sex differences in variables such as ideal body image and potato chip intake) using  
 562 PROCESS Model 1. Condition was entered as the predictor (*X*) and potato chip intake as the  
 563 outcome (*Y*). Body image (actual and ideal) and body dissatisfaction (actual-ideal, actual-average,  
 564 actual-attractive; shown in the supplementary materials) were entered in turn as moderators (*W*).  
 565 Hunger, BMI, average liking of chips and current dieting status were entered as covariates.

#### 566 *Females.*

567 For actual body image scores, the overall model was significant,  $F(7,73)=6.88, p<.001$ , and  
 568 explained 39.75% of the variance, but the interaction was not significant,  $R^2_{change}=0.00$ ,  
 569  $F(1,73)=.50, p=.480$ . For ideal body image scores, the overall model was significant,  
 570  $F(7,73)=8.43, p<.001$ , and explained 44.71% of the variance. The interaction was also significant,  
 571  $R^2_{change}=0.05, F(1,73)=6.39, p=.014$ , see Figure 2. Specifically, female in the personal Instagram  
 572 condition consumed significantly less potato chips than those in the control Instagram condition  
 573 when they reported a lower body image score as ideal (i.e., a thinner body was rated as ideal),  $B=-$   
 574  $6.33, SE=2.82, t(73)=-2.25, p=.028 [CI=-11.94-.72]$ . There was no significant difference in intake  
 575 when participants reported an average ( $B=-1.12, SE=1.91, t(73)=-.58, p=.561 [CI=-4.93-2.69]$ ) or  
 576 higher ( $B=4.10, SE=2.81, t(73)=1.46, p=.149 [CI=-1.50-9.70]$ ) body image scores as ideal between  
 577 the two conditions. Results for body dissatisfaction variables are presented in the supplementary  
 578 materials.

579

580

581 *Figure 4.* Moderation of the effect of condition on kcal intake by ideal body image for females (*M,*  
 582 *-/+ 1SD, \*denotes significant difference,  $p<.05$* ).

583

#### 584 *Males.*

585 For actual body image scores, the overall model was significant,  $F(7,58)=6.57, p<.001$ , and  
 586 explained 44.24% of the variance. The interaction was also significant,  $R^2_{change}=0.06, F(1,58)=5.73,$

---

<sup>6</sup>Power analysis for moderation:  $R^2$  increase requires 55 participants to detect medium effect at 80% ( $p=.05$ ) for 1 tested predictor and 7 total predictors.

587  $p=.020$ , see Figure 3. Specifically, males in the personal Instagram condition consumed  
588 significantly less potato chips than those in the control Instagram condition when they reported  
589 their actual body image as being lower (i.e., thinner),  $B=-8.95$ ,  $SE=4.20$ ,  $t(58)=-2.13$ ,  $p=.037$  [ $CI=-$   
590  $17.36-.54$ ]. When participants reported an average ( $B=-1.82$ ,  $SE=2.94$ ,  $t(58)=-.62$ ,  $p=.540$  [ $CI=-$   
591  $7.71-4.08$ ]) or higher ( $B=5.32$ ,  $SE=4.18$ ,  $t(58)=1.27$ ,  $p=.208$  [ $CI=-3.05-13.69$ ]) body image score,  
592 intake across the conditions was similar. Results for ideal body image and body dissatisfaction  
593 variables are presented in the supplementary materials.

594  
595

596 *Figure 5. Moderation of the effect of condition on kcal intake by actual body image for males ( $M,$   
597  $-/+ 1SD$ , \*denotes significant difference,  $p<.05$ ).*

598

599 For ideal body image scores, the overall model was significant,  $F(7,58)=5.72$ ,  $p<.001$ , and  
600 explained 40.84% of the variance, but the interaction was not significant,  $R^2_{change}=.03$ ,  
601  $F(1,58)=2.68$ ,  $p=.107$ . Results for body dissatisfaction variables are presented in the  
602 supplementary materials.

603

### 604 3.3. Study 2 Discussion

605 Results from Study 2 supported some of our hypotheses. In terms of body image and body  
606 dissatisfaction, females reported significantly greater body dissatisfaction than males for all levels  
607 of discrepancy (actual – ideal, average and attractive; H1a). We also found that actual body image  
608 was reported as significantly larger by participants that viewed their personal Instagram compared  
609 to the control (H1), but this did not remain significant when applying the  $p$  value adjustment. We  
610 did not find support for significant sex by condition interactions (H1b). In terms of potato chip  
611 intake, we only found support for males consuming significantly more than females and found our  
612 proposed mediation model was not significant (H3). There was also no significant sex by condition  
613 interaction, where participants from the personal Instagram condition did not consume  
614 significantly more potato chips than their same gender counterparts in the control condition (H2b).

615 Exploratory moderation analyses revealed that ideal body image for females and actual  
616 body image for males moderated the effect of condition on potato chip intake. Females in the  
617 personal Instagram condition consumed significantly less potato chips when they reported a

618 smaller body size as being ideal compared to females in the control Instagram condition. In  
619 contrast, males in the personal Instagram condition consumed significantly less potato chips when  
620 they selected a smaller body size as representing their actual body compared to males in the control  
621 Instagram condition.

622

#### 623 **4. Discussion**

624 Our first overall aim was to examine the impact of social media on body image (aim 1).  
625 We found some support that brief exposure (less than 10 minutes) has a negative effect on body  
626 image. Specifically, female participants in the social media condition in Study 1 reported their  
627 actual body image as significantly larger than those in the control condition (online news website),  
628 but this was not replicated in Study 2 (after *p* value adjustment). We also found that after viewing  
629 their personal Instagram (Study 2), females reported a significantly smaller ideal body image  
630 whereas males reported a significantly larger ideal body image. We found support for our  
631 hypothesis that social media exposure would result in greater body dissatisfaction (H1) in Study  
632 1, however, this was not the case in Study 2. Participants who viewed their own social media in  
633 Study 2 did not report significantly more body dissatisfaction than those who viewed the control  
634 account. It is likely that this is due to the condition versus sex interaction. Although the interactions  
635 were not significant overall, there were pairwise comparisons in which the effect of social media  
636 resulted in females being more likely to want a smaller body compared to males who were more  
637 likely to want a larger body. A strength of the current studies was the use of participants' own  
638 social media accounts, and therefore, engagement with the types of content they encounter in daily  
639 life (i.e., based on who they 'follow', 'like' and who they are 'friends' with). This is in comparison  
640 to previous studies where exposure to social media involved experimenter-curated 'ideal' images  
641 that have been specifically selected (e.g., Fardouly & Holland, 2018; Tiggemann & Anderberg,  
642 2020). We show that the content participants view, and the images they choose to view daily, even  
643 for a short period of time, can have a detrimental impact on their body image. These findings are  
644 supported across social media platforms, and, although mechanisms may differ, across both males  
645 and females.

646 Our second aim was to assess the impact of social media on eating behavior (aim 2). We  
647 found no significant effect of a short bout of social media use on eating behavior (H2 unsupported).  
648 However, this prediction was informed by the current available literature which is predominantly



649 based on correlational findings, in which a causal relationship between patterns of social media  
650 use and restrained/disordered eating behaviors are unclear (e.g. Bennett et al., 2020; Griffiths et  
651 al., 2018; McLean et al., 2015; Modica, 2020; Saunders & Eaton, 2018; Stronge et al., 2015). Our  
652 studies provide initial tests of the causal relationship between social media and eating behaviors,  
653 but further work is needed measuring other types of food-related behaviors.

654 Finally, we aimed to investigate the relationship between social media, body image and  
655 eating behaviors (aim 3). We found that body dissatisfaction mediated the relationship between  
656 condition and portion size selection in study 1 (H3). Here, participants who viewed Facebook,  
657 relative to an online news website (control), reported increased body dissatisfaction which in turn  
658 led to selection of smaller portions. The consumption of smaller portions could be a weight  
659 management behavior to reduce calorie intake in a bid to lose weight and alleviate body  
660 dissatisfaction. We did not find a similar pattern of results when testing the mediation model in  
661 Study 2. The relationship between social media, body image, and eating behaviors has been  
662 summarized as complex and inconsistent in a systematic review, and there may be other  
663 moderators and boundary conditions contributing to their relationship (Rounsefell et al., 2020).  
664 Exploratory analysis of Study 2 did suggest that gender differences may play a role in the how  
665 social media effects body dissatisfaction and in turn eating behaviors.

666 Specifically, in our exploratory moderation analyses we found significant interactions  
667 between condition and body image perceptions for females and males. When females viewed their  
668 personal Instagram and rated a thinner body as ideal, they consumed significantly less potato chips  
669 than participants in the control Instagram condition. It is possible that viewing social media acts  
670 as a catalyst to individuals reducing calorie intake when they rate a smaller body as being ideal. In  
671 contrast, for males it was when they reported their actual body size as being thinner that they  
672 consumed significantly less potato chips when in the personal Instagram condition compared to  
673 the control Instagram condition. These findings suggest that the typical tendency for males who  
674 perceive their bodies as smaller to consume more potato chips as a snack (i.e., in the control  
675 condition) may be suppressed following exposure to their personal social media content. This  
676 could reflect a motivation to maintain their current body size following comparisons to others on  
677 Instagram. Social media appears to influence males and females differently in terms of both body  
678 image and eating behaviors. However, these are preliminary findings and further work is required  
679 to tease out the exact mechanisms and to test different foods and eating behavior environments.

680 Strengths of our study include participants viewing their own social media and the use of  
681 multimethod measurements of eating behaviors. Nevertheless, it is important to highlight the  
682 limitations of examining eating behaviors in research. We utilized a portion size selection task as  
683 an analogue for desired food intake (Study 1). Whilst research suggests portion size tasks are a  
684 strong indicator of desired food choice, they do not measure food intake and therefore caution is  
685 needed interpreting findings. In addition, we used an ad-libitum snack task over a small period  
686 with just one food whilst watching a neutral documentary (Study 2). A wider range of test food,  
687 longer consumption periods and checks of boredom eating (Domoff, Meers, Koball, & Musher-  
688 Eizenman, 2014; Koball, Meers, Storfer-Isser, Domoff, & Musher-Eizenman, 2012) could have  
689 resulted in different findings. Future studies should look to capture food intake across a longer  
690 period and a variety of foods, such as whether viewing social media influences immediate versus  
691 delayed food intake. In line with this, while we assessed, and controlled for, current hunger levels  
692 in our analyses, the study was completed by participants across the day and therefore participants  
693 may have stronger/weaker desires to consume snacks. Another limitation is that we only collected  
694 post-task measures of body image and body dissatisfaction. This was to prevent participant burden  
695 and participants were randomly assigned to the experimental conditions to reduce influences from  
696 individual differences. Finally, we are unable to know the exact images and content that  
697 participants were viewing on their social media accounts, and consequently, are unable to  
698 control/standardize the images and content they were exposed to. However, our overall design and  
699 the use of participants viewing their own social media provides a more ecologically valid  
700 manipulation compared to researcher curated images, since participants can ‘scroll through’  
701 content of their real accounts. That said, we instructed our participants to be passive users  
702 (monitoring social media without direct engagement) of social media compared to active users  
703 (direct engagement with others on social media) and further research on the impact of type of  
704 engagement is required (Trifiro & Gerson, 2019; Valkenburg, van Driel, & Beyens, 2022).

705

## 706 **5. Conclusion**

707 In conclusion, our studies suggest brief exposure to social media may lead to poorer  
708 perceptions of one’s body but may not influence subsequent eating behaviors. However, we saw  
709 initial support for restricted intake in males and females who perceived their own body as smaller  
710 and wanted a smaller body, respectively. Our results have significant implications on both practice

711 and contributing to the knowledge available on social media and body dissatisfaction. Coming on  
712 the heels of the release of the Facebook files, (Wells et al., 2021), this paper further adds  
713 affirmation to the wealth of literature on social media and body image, while taking the initial  
714 steps to examine the causal relationship between social media, body image and eating behavior.  
715 We also take initial steps in differentiating the impact and subsequent behaviors of social media  
716 between males and females. Additional work is required here to further tease apart sex and  
717 individual differences.

718

ACCEPTED

## References

- 719
- 720 Bennett, B. L., Whisenhunt, B. L., Hudson, D. L., Wagner, A. F., Latner, J. D., Stefano, E. C., &  
721 Beauchamp, M. T. (2020). Examining the impact of social media on mood and body  
722 dissatisfaction using ecological momentary assessment. *Journal of American College*  
723 *Health, 68*(5), 502–508. doi: 10.1080/07448481.2019.1583236
- 724 Callan, M. J., Ellard, J., & Hodgins, D. (2008). Gambling as a Search for Justice: Examining the  
725 Role of Personal Relative Deprivation in Gambling Urges and Gambling Behavior . *Article*  
726 *in Personality and Social Psychology Bulletin*. doi: 10.1177/0146167208322956
- 727 Cappelleri, J. C., Bushmakin, A. G., Gerber, R. A., Leidy, N. K., Sexton, C. C., Lowe, M. R., &  
728 Karlsson, J. (2009). Psychometric analysis of the Three-Factor Eating Questionnaire-R21:  
729 Results from a large diverse sample of obese and non-obese participants. *International*  
730 *Journal of Obesity, 33*, 611–620. doi: 10.1038/ijo.2009.74
- 731 Cheon, B. K., Lim, E. X., McCrickerd, K., Zaihan, D., & Forde, C. G. (2018). Subjective  
732 socioeconomic status modulates perceptual discrimination between beverages with different  
733 energy densities. *Food Quality and Preference, 68*, 258–266. doi:  
734 10.1016/j.foodqual.2018.03.010
- 735 Cheon, Bobby K, & Hong, Y. Y. (2017). Mere experience of low subjective socioeconomic  
736 status stimulates appetite and food intake. *Proceedings of the National Academy of Sciences*  
737 *of the United States of America, 114*(1), 72–77. doi: 10.1073/pnas.1607330114
- 738 Clement, J. (2020). Social media - Statistics & Facts.
- 739 Cohen, R., Newton-John, T., & Slater, A. (2018). 'selfie'-objectification: The role of selfies in  
740 self-objectification and disordered eating in young women. *Computers in Human Behavior,*  
741 *79*, 68–74. doi: 10.1016/j.chb.2017.10.027
- 742 Crandall, C. S. (1994). Prejudice against fat people: Ideology and self-interest. *Journal of*  
743 *Personality and Social Psychology, 66*(5), 882–894.
- 744 Domoff, S. E., Meers, M. R., Koball, A. M., & Musher-Eizenman, D. R. (2014, December 12).  
745 The validity of the Dutch Eating Behavior Questionnaire: Some critical remarks. *Eating and*  
746 *Weight Disorders, Vol. 19*, pp. 137–144. Springer. doi: 10.1007/s40519-013-0087-y
- 747 Engeln, R., Loach, R., Imundo, M. N., & Zola, A. (2020). Compared to Facebook, Instagram use  
748 causes more appearance comparison and lower body satisfaction in college women. *Body*  
749 *Image, 34*, 38–45. doi: 10.1016/j.bodyim.2020.04.007

- 750 Fardouly, J., & Holland, E. (2018). Social media is not real life: The effect of attaching  
751 disclaimer-type labels to idealized social media images on women's body image and mood.  
752 *New Media and Society*, 20(11), 4311–4328. doi: 10.1177/1461444818771083
- 753 Fardouly, J., Pinkus, R. T., & Vartanian, L. R. (2017). The impact of appearance comparisons  
754 made through social media, traditional media, and in person in women's everyday lives.  
755 *Body Image*, 20, 31–39. doi: 10.1016/j.bodyim.2016.11.002
- 756 Fardouly, J., & Vartanian, L. R. (2016). Social Media and Body Image Concerns: Current  
757 Research and Future Directions. *Current Opinion in Psychology*, Vol. 9, pp. 1–5. Elsevier.  
758 doi: 10.1016/j.copsyc.2015.09.005
- 759 Friedman, M. I., Ulrich, P., & Mattes, R. D. (1999). A figurative measure of subjective hunger  
760 sensations. *Appetite*, 32(3), 395–404. doi: 10.1006/appe.1999.0230
- 761 Gibbons, F. X. (1986). Social comparison and depression: Company's effect on misery.:  
762 EBSCOhost. *Journal of Personality and Social Psychology*, 51(1), 140–148.
- 763 Gomez, M., Klare, D., Ceballos, N., Dailey, S., Kaiser, S., & Howard, K. (2021). *Do You Dare*  
764 *to Compare?: The Key Characteristics of Social Media Users Who Frequently Make Online*  
765 *Upward Social Comparisons*. doi: 10.1080/10447318.2021.1976510
- 766 Griffiths, S., Hay, P., Mitchison, D., Mond, J. M., McLean, S. A., Rodgers, B., ... Paxton, S. J.  
767 (2016). Sex differences in the relationships between body dissatisfaction, quality of life and  
768 psychological distress. *Australian and New Zealand Journal of Public Health*, 40(6), 518–  
769 522. doi: 10.1111/1753-6405.12538
- 770 Griffiths, S., Murray, S. B., Krug, I., & McLean, S. A. (2018). The Contribution of Social Media  
771 to Body Dissatisfaction, Eating Disorder Symptoms, and Anabolic Steroid Use among  
772 Sexual Minority Men. *Cyberpsychology, Behavior, and Social Networking*, 21(3), 149–156.  
773 doi: 10.1089/cyber.2017.0375
- 774 Harrison, K., Taylor, L. D., & Marske, A. L. (2006). Women's and men's eating behavior  
775 following exposure to ideal-body images and text. *Communication Research*, Vol. 33, pp.  
776 507–529. doi: 10.1177/0093650206293247
- 777 Hawkins, L. K., Farrow, C., & Thomas, J. M. (2020). Do perceived norms of social media users'  
778 eating habits and preferences predict our own food consumption and BMI? *Appetite*, 149,  
779 104611. doi: 10.1016/j.appet.2020.104611
- 780 Hayes, A. F. (2018). *Introduction to Mediation, Moderation, and Conditional Process Analysis*

- 781 (2nd ed.). Guildford Press.
- 782 Hogue, J. V., & Mills, J. S. (2019). The effects of active social media engagement with peers on  
783 body image in young women. *Body Image*, 28, 1–5. doi: 10.1016/j.bodyim.2018.11.002
- 784 Holland, G., & Tiggemann, M. (2016). A systematic review of the impact of the use of social  
785 networking sites on body image and disordered eating outcomes. *Body Image*, Vol. 17, pp.  
786 100–110. Elsevier Ltd. doi: 10.1016/j.bodyim.2016.02.008
- 787 Hu, Y., Manikonda, L., & Kambhampati, S. (2014). What We Instagram: A First Analysis of  
788 Instagram Photo Content and User Types. *Proceedings of the International AAAI*  
789 *Conference on Web and Social Media*, 8(1).
- 790 Hunt, M. G., Marx, R., Lipson, C., & Young, J. (2018). No more FOMO: Limiting social media  
791 decreases loneliness and depression. *Journal of Social and Clinical Psychology*, 37(10),  
792 751–768. doi: 10.1521/jscp.2018.37.10.751
- 793 Ioannidis, K., Taylor, C., Holt, L., Brown, K., Lochner, C., Fineberg, N. A., ... Czabanowska, K.  
794 (2021). Problematic usage of the internet and eating disorder and related psychopathology:  
795 A multifaceted, systematic review and meta-analysis. *Neuroscience & Biobehavioral*  
796 *Reviews*, 125, 569–581. doi: 10.1016/J.NEUBIOREV.2021.03.005
- 797 Knäuper, B., Rabiau, M., Cohen, O., & Patriciu, N. (2004). Compensatory health beliefs: Scale  
798 development and psychometric properties. *Psychology and Health*, 19(5), 607–624. doi:  
799 10.1080/0887044042000196737
- 800 Koball, A. M., Meers, M. R., Storfer-Isser, A., Domoff, S. E., & Musher-Eizenman, D. R.  
801 (2012). Eating when bored: Revision of the emotional eating scale with a focus on boredom.  
802 *Health Psychology*, 31(4), 521–524. doi: 10.1037/a0025893
- 803 Lee, M., & Lee, H. H. (2021). Social media photo activity, internalization, appearance  
804 comparison, and body satisfaction: The moderating role of photo-editing behavior.  
805 *Computers in Human Behavior*, 114, 106579. doi: 10.1016/J.CHB.2020.106579
- 806 Limniou, M., Ascroft, Y., & McLean, S. (2021). Differences between Facebook and Instagram  
807 Usage in Regard to Problematic Use and Well-Being. *Journal of Technology in Behavioral*  
808 *Science*, 1–10. doi: 10.1007/s41347-021-00229-z
- 809 Livingston, J., Holland, E., & Fardouly, J. (2020). Exposing digital posing: The effect of social  
810 media self-disclaimer captions on women's body dissatisfaction, mood, and impressions of  
811 the user. *Body Image*, 32, 150–154. doi: 10.1016/J.BODYIM.2019.12.006

- 812 Marcus, B. H., & Forsyth, L. H. (2009). Motivating People to Be Physically Active. In  
813 *Motivating People to Be Physically Active*. Human Kinetics Publishers Inc. doi:  
814 10.5040/9781492596356
- 815 McLean, S. A., Paxton, S. J., Wertheim, E. H., & Masters, J. (2015). Photoshopping the selfie:  
816 Self photo editing and photo investment are associated with body dissatisfaction in  
817 adolescent girls. *International Journal of Eating Disorders*, 48(8), 1132–1140. doi:  
818 10.1002/eat.22449
- 819 Meier, E. P., & Gray, J. (2014). Facebook photo activity associated with body image disturbance  
820 in adolescent girls. *Cyberpsychology, Behavior, and Social Networking*, 17(4), 199–206.  
821 doi: 10.1089/cyber.2013.0305
- 822 Modica, C. A. (2020). The Associations Between Instagram Use, Selfie Activities, Appearance  
823 Comparison, and Body Dissatisfaction in Adult Men. <https://Home.Liebertpub.Com/Cyber,>  
824 23(2), 90–99. doi: 10.1089/CYBER.2019.0434
- 825 Morrison, T. G., Kalin, R., & Morrison, M. A. (2004). Body-image evaluation and body-image  
826 investment among adolescents: A test of sociocultural and social comparison theories.  
827 *Adolescence*, Vol. 39, pp. 571–592.
- 828 Ross, C., Orr, E. S., Sisic, M., Arseneault, J. M., Simmering, M. G., & Orr, R. R. (2009).  
829 Personality and motivations associated with Facebook use. *Computers in Human Behavior*,  
830 25(2), 578–586. doi: 10.1016/j.chb.2008.12.024
- 831 Rounsefell, K., Gibson, S., McLean, S., Blair, M., Molenaar, A., Brennan, L., ... McCaffrey, T.  
832 A. (2020). Social media, body image and food choices in healthy young adults: A mixed  
833 methods systematic review. *Nutrition and Dietetics*, 77(1), 19–40. doi: 10.1111/1747-  
834 0080.12581
- 835 Ryding, F. C., & Kuss, D. J. (2020). The use of social networking sites, body image  
836 dissatisfaction, and body dysmorphic disorder: A systematic review of psychological  
837 research. *Psychology of Popular Media*, 9(4), 412–435. doi: 10.1037/ppm0000264
- 838 Saiphoo, A. N., & Vahedi, Z. (2019, December). A meta-analytic review of the relationship  
839 between social media use and body image disturbance. *Computers in Human Behavior*, Vol.  
840 101, pp. 259–275. Elsevier Ltd. doi: 10.1016/j.chb.2019.07.028
- 841 Saunders, J. F., & Eaton, A. A. (2018). Snaps, selfies, and shares: How three popular social  
842 media platforms contribute to the sociocultural model of disordered eating among young

- 843 women. *Cyberpsychology, Behavior, and Social Networking*, 21(6), 343–354. doi:  
844 10.1089/cyber.2017.0713
- 845 Schaefer, L. M., Harriger, J. A., Heinberg, L. J., Soderberg, T., & Kevin Thompson, J. (2017).  
846 Development and validation of the sociocultural attitudes towards appearance  
847 questionnaire-4-revised (SATAQ-4R). *International Journal of Eating Disorders*, 50(2),  
848 104–117. doi: 10.1002/eat.22590
- 849 Sim, A. Y., Lim, E. X., Forde, C. G., & Cheon, B. K. (2018). Personal relative deprivation  
850 increases self-selected portion sizes and food intake. *Appetite*, 121, 268–274. doi:  
851 10.1016/j.appet.2017.11.100
- 852 Sim, A. Y., Lim, E. X., Leow, M. K., & Cheon, B. K. (2018). Low subjective socioeconomic  
853 status stimulates orexigenic hormone ghrelin – A randomised trial.  
854 *Psychoneuroendocrinology*, 89, 103–112. doi: 10.1016/j.psyneuen.2018.01.006
- 855 Stice, E. (2002). Risk and maintenance factors for eating pathology: A meta-analytic review.  
856 *Psychological Bulletin*, 128(5), 825–848. doi: 10.1037/0033-2909.128.5.825
- 857 Stronge, S., Greaves, L. M., Milojev, P., West-Newman, T., Barlow, F. K., & Sibley, C. G.  
858 (2015). Facebook is Linked to Body Dissatisfaction: Comparing Users and Non-Users. *Sex*  
859 *Roles*, 73(5–6), 200–213. doi: 10.1007/s11199-015-0517-6
- 860 Swami, V., Frederick, D. A., Aavik, T., Alcalay, L., Allik, J., Anderson, D., ... Zivcic-Becirevic,  
861 I. (2010). The attractive female body weight and female body dissatisfaction in 26 countries  
862 across 10 world regions: Results of the international body project I. *Personality and Social*  
863 *Psychology Bulletin*, 36(3), 309–325. doi: 10.1177/0146167209359702
- 864 Teachman, B. A., & Brownell, K. D. (2001). Implicit anti-fat bias among health professionals: Is  
865 anyone immune? *International Journal of Obesity*, 25(10), 1525–1531. doi:  
866 10.1038/sj.ijo.0801745
- 867 Tiggemann, M., & Anderberg, I. (2020). Social media is not real: The effect of ‘Instagram vs  
868 reality’ images on women’s social comparison and body image. *New Media and Society*,  
869 22(12), 2183–2199. doi: 10.1177/1461444819888720
- 870 Tiggemann, M., Hayden, S., Brown, Z., & Veldhuis, J. (2018). The effect of Instagram “likes”  
871 on women’s social comparison and body dissatisfaction. *Body Image*, 26, 90–97. doi:  
872 10.1016/j.bodyim.2018.07.002
- 873 Trifiro, B. M., & Gerson, J. (2019). Social Media Usage Patterns: Research Note Regarding the



- 874 Lack of Universal Validated Measures for Active and Passive Use. *Social Media + Society*.  
875 doi: 10.1177/2056305119848743
- 876 Valkenburg, P. M., van Driel, I. I., & Beyens, I. (2022). The associations of active and passive  
877 social media use with well-being: A critical scoping review. *New Media & Society*, 24(2),  
878 530–549. doi: 10.1177/14614448211065425
- 879 van den Berg, P., Paxton, S. J., Keery, H., Wall, M., Guo, J., & Neumark-Sztainer, D. (2007).  
880 Body dissatisfaction and body comparison with media images in males and females. *Body*  
881 *Image*, 4(3), 257–268. doi: 10.1016/j.bodyim.2007.04.003
- 882 Vaterlaus, J. M., Patten, E. V., Roche, C., & Young, J. A. (2015). #Gettinghealthy: The  
883 perceived influence of social media on young adult health behaviors. *Computers in Human*  
884 *Behavior*, 45, 151–157. doi: 10.1016/J.CHB.2014.12.013
- 885 Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures  
886 of positive and negative affect: The PANAS scales. *Journal of Personality and Social*  
887 *Psychology*, 54(6), 1063–1070. doi: 10.1037//0022-3514.54.6.1063
- 888 Wells, G., Horwitz, J., & Seetharaman, D. (2021). Facebook Knows Instagram Is Toxic for Teen  
889 Girls, Company Documents Show - WSJ. Retrieved October 5, 2021, from The Wall Street  
890 Journal website: [https://www.wsj.com/articles/facebook-knows-instagram-is-toxic-for-teen-](https://www.wsj.com/articles/facebook-knows-instagram-is-toxic-for-teen-girls-company-documents-show-11631620739?mod=hp_lead_pos7&mod=article_inline)  
891 [girls-company-documents-show-11631620739?mod=hp\\_lead\\_pos7&mod=article\\_inline](https://www.wsj.com/articles/facebook-knows-instagram-is-toxic-for-teen-girls-company-documents-show-11631620739?mod=hp_lead_pos7&mod=article_inline)
- 892 Wilkinson, L. L., Hinton, E. C., Fay, S. H., Ferriday, D., Rogers, P. J., & Brunstrom, J. M.  
893 (2012). Computer-based assessments of expected satiety predict behavioural measures of  
894 portion-size selection and food intake. *Appetite*, 59(3), 933–938. doi:  
895 10.1016/j.appet.2012.09.007  
896