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Instagram Use and Body Dissatisfaction: Investigating the Roles of Sexual

Orientation and Appearance Comparisons

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Abstract

The present study examined potential mediators (upward and downward appearance comparisons), moderator (sexual orientation), and moderated mediation of the connection between Instagram use and body dissatisfaction. The sample consisted of 177 Dutch participants, of which approximately half were heterosexual or gay men, and half were heterosexual or lesbian women. Consistent with earlier findings, the preliminary analyses revealed more body dissatisfaction, as well as the tendency to compare oneself upwards, for homosexual men than for heterosexual men. A reversed effect was found within the female sample, indicating more body dissatisfaction and more tendency to compare oneself upwards among heterosexual women, compared to lesbian women. Contrary to expectations, the proposed moderated mediation analysis turned out to be non-significant. No association between Instagram use and body dissatisfaction was found. Implications for future Instagram research are discussed.

Keywords: social media, Instagram, sexual orientation, appearance comparison, body dissatisfaction

Acknowledgements

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The average adolescent swipes and scrolls through dozens, if not hundreds of photos on social media every day. Because of the smartphone device people spend a lot of time a day on social media (Kim, Wang, & Oh, 2016), such as Facebook and Instagram, which are enormously popular platforms. Instagram, created in 2010, was designed for people to share their life moments through photos (Instagram, 2018). To date, Instagram is one of the fastest growing social media platforms, and currently has more than 1 billion users worldwide (Instagram, 2018; Smart Insights, 2016). Within the Netherlands, a total of 4.1 million Instagram accounts do exist, of which 2.1 million are used daily (Newcom, 2018). The emergence of Instagram has provided people with much more opportunities to compare themselves to the appearance of others than with traditional media. Researchers have suggested that Instagram differentiates itself from other social media platforms, for it is more appearance-orientated and may thus be more destructive to a user's concern of appearance (Fardouly & Vartanian, 2016; Holland & Tiggemann, 2016). Instagram offers its users many edit tools to enhance photos, such as filters, which allow its users to create the perfect picture. As a consequence, many of these photos portray highly idealized attractive men and women, therewith enabling its downside for the body perception of many social media users (Hendrickse, Arpan, Clayton, & Ridgway, 2017). Multiple studies have acknowledged such a problematic link between Facebook usage and body dissatisfaction (BD), where people who use Facebook more often, tend to be less satisfied with their bodies (Fardouly & Vartanian, 2015; Mabe, Forney, & Keel, 2014), therewith creating risk factors for the emergence of eating disorders such as anorexia nervosa (Grabe, Hyde, & Lindberg, 2007; Johnson & Wardle, 2005). However, these findings only account for heterosexual women and less

research has examined the experiences of gay men and lesbian women between social media use and bodily issues. The present study aims to examine the relations between Instagram use, appearance comparisons and BD, and adds to the current body of literature by taking sexuality differences into account.

BD issues originate two important concerns that merit further examination. Firstly, how are gender and sexual orientation related with BD? Secondly, what is the impact of appearance comparisons in conjunction with Instagram use on BD? Body image can be defined as the concept of how one feels, thinks, and behaves with concern to one's own physical attributes (Muth & Cash, 1997). Hence, when one speaks of BD, this indicates a subjective disapproval of the body shape and may occur a belief that one's own body is less attractive than it really is (American Psychiatric Association, 2013). Females in their adolescence are particularly vulnerable for body image disturbance, as puberty entails many physical changes, which often results in more BD (Davison & McCabe, 2006). However, research has indicated that BD is also a burden among adolescent men (Presnell, Bearman, & Stice, 2004). An aspiration to alter shape or weight has been found for both genders (McCabe & Ricciardelli, 2001). Among the male population, gay men in particular seem to be at risk to develop more BD, compared to their heterosexual counterparts (Morrison, Morrison, & Sager, 2004). Gay men reported a greater desire for more muscle tone and tend to have more dissatisfaction with regard to their overall body fat (Calzo, Corliss, Blood, Field, & Austin, 2003; Griffiths, Murray, Krug, & McLean, 2018; Levesque & Vichesky, 2006; Martins, Tiggemann, & Churchett, 2008). A reason for this might be found in the fact that gay men, unlike their heterosexual counterparts, attempt to attract other men. Although women can be very critical about a partner's appearance (Fales et al., 2016), research has pointed out that this feature is significantly more important for men, regardless of their sexuality (Legenbauer et al., 2009). As a consequence, gay men might experience more pressure to be attractive,

seeing that their potential partners belong to the most appearance-discriminating gender. This line of argumentation was supported by a meta-analysis that was conducted by Morrison et al. (2004), in which the body satisfaction of gay men and heterosexual men were compared. The results revealed a significantly worse body image among gay men than among heterosexual men, albeit with a relatively small effect size ($d = .29$). Furthermore, gay men appeared to be more dissatisfied with their appearance than heterosexual men ($d = .40$, moderate effect), as was assessed by means of the Body Dissatisfaction Subscale of the Eating Disorder Inventory, which was used in six more studies. Taken together, research so far has provided considerable evidence that gay men tend to report more BD than heterosexual men.

As has been mentioned before, research so far has mainly focused on heterosexual women's BD. However, the aforementioned meta-analysis by Morrison et al. (2014) revealed a significant difference when directly comparing heterosexual women with lesbian women, of which the latter appeared to be more satisfied with their bodies, although with a small effect size ($d = .12$). Research to BD was mostly performed within large samples of women, but has not always controlled for sexual orientation, which is why some past research results may have been blurred. Some theorists have proposed that lesbians, just like straight women, grow up in a society with a dominant cultural ideal of a certain body type and therefore assume that both internalize this appearance related image (Dworkin, 1989; Rothblum, 1994). This presumption has been corroborated by Paplau et al. (2009). As a consequence, they might all feel judged on their appearance and experience similar body image issues. Overall, it seems that heterosexual and lesbian women do not differ that much with each other when it comes to experiencing BD.

A possible explanation for the sexuality differences in terms of BD might be found in social comparison, which has been proposed as a potential mediator between social media use

and body shame (Fardouly & Vartanian, 2015; Hanna et al., 2017; Tiggemann & Zaccardo,

2015). A meta-analysis of Myers and Crowther (2009) reviewed the relation of social

comparison with BD and found a large effect size ($d = 0.77$), which suggests that comparing

oneself to others is strongly related to BD. Social comparison theory proposes that

individuals evaluate their position and progress on different aspects of their lives, and tend to

compare themselves to others in order to assess their position in absence of objective

standards (Festinger, 1954). Downward and upward comparisons are two ways of evaluating

oneself to the external world. More positive consequences on the mood are present after

individuals compare themselves to others whom are perceived to be worse off than

themselves in the downward way (Gibbons & Gerrard, 1989; Wills, 1981). Conversely,

negative consequences on individual's self-image are common when people compare

themselves to others, who they perceive as better than themselves (Wood, 1989). The latter

comparison style might occur more frequently with Instagram use, as users present their ideal

selves through selective self-presentation (Mehdizadeh, 2010). In contrast to men, women

report more BD if they tend to compare their own appearance to that of others they see on

social media (Fardouly, Pinkus, & Vartanian, 2017). In a study on the use of either upward or

downward comparisons, men's and women's self-descriptions were reviewed and revealed

that straight men were less critical to themselves and used more downward comparisons than

women (Strahan, Wilson, Cressman, & Buote, 2006). However, men's tendency to be less

self-critical could also be a way to cope with some un-comfortabilities, like self-enhancement

motives propose; people with negative self-concepts will compensate their lack of self-

esteem to increase their feelings of personal worth (Epstein, 1973; Jones, 1973). In contrast to

research of Strahan et al. (2006), Hargreaves and Tiggemann (2009) found that men made

more upward comparisons when exposed to television commercials showing muscular ideal.

This suggestion seems plausible, for men are believed to attribute high aesthetical value to fit

and muscular bodies (Frederick, Fessler, & Haselton, 2005). Overall, studies so far have established strong effects of social comparisons on BD, but the role of social media yet remains somewhat underexposed.

Media plays an important role in body image issues, and exposure to ideal images seem to influence BD mainly for women (Groesz, Levine, & Murnen, 2002; Shaw & Waller, 1995). Although Instagram is a popular social media platform, little research has been done on its behalf. As Facebook and Instagram show strong similarities in terms of their social functions and content sharing, it is of interest to gain more knowledge about research on Facebook. Vogel, Rose, Okdie, Eckles, and Franz (2015) observed that participants who showed more comparisons also used Facebook more intensely than participants who compared less. According to Lee (2014), two possible explanations can be at hand. Firstly, it could be the case that people who have the tendency to compare themselves to others, are prone to use Facebook more intensively. Secondly, those who use Facebook more frequently are being exposed to more social content, and consequently are more inclined to compare themselves to others. Another study among women showed that upward comparisons to peers, mediated the association between Facebook usage (i.e., more time) and body image concerns (Fardouly & Vartanian, 2015). Most studies that have examined the relation between social media use and body issues used merely female samples, however, there have been some studies conducted that additionally took gender differences into account. Manago, Ward, Lemm, Reed, and Seabrook (2015) argued that both men and women reported more body shame when they showed more activity on Facebook. Similarly, another study found more BD in men and women after exposure to attractive Facebook accounts (Haferkamp & Krämer, 2011), which supports that more upward comparison may lead to more BD. In a study of Kim and Chock (2015), researchers found that higher levels of engagement on Facebook (e.g., visiting profiles, giving likes, and leaving comments) were positively

associated with social comparison and the urge to be thin for both men and women. The effect being more strongly pronounced among women. Although men may not experience as much BD as women when they compare themselves on social media, differences in BD among men seem to depend on sexual orientation.

The present study aims to examine the roles of Instagram usage, upwards and downwards social comparison, and sexual orientation in predicting the outcome variable BD. The model will be applied to men and women separately, in order to keep the interpretation of the results feasible. With regard to the above described rationale on the behalf of men, it is hypothesized that more Instagram use is associated with more BD. Further, it is predicted that more Instagram use predicts less BD through stronger downward comparison for heterosexual men, but not for homosexual men, whereas more Instagram use is expected to lead to more BD through upward comparison, but only for homosexual men. Sexual orientation is expected to specifically moderate the tendency to compare either upward or downward on Instagram. On the behalf of women, it is predicted that more Instagram usage predicts more BD. Also hypothesized that more Instagram use predicts more BD through stronger upward comparisons for both heterosexual and lesbian women. At last, it is expected that sexual orientation moderates the mediation of upward comparison between Instagram usage and BD.

Method

Participants

A total of 270 persons participated in the study and identified themselves as Instagram users. However, 25 respondents did not have an account for at least 6 months and were excluded. Another 10 respondents were excluded for being over 26 years of age. In order to avoid biases due to language unproficiency, 7 respondents who did not declare to be Dutch or Belgian were excluded too. Additionally, 20 individuals have chosen to report themselves as

other than straight or gay/lesbian, and were therefore also excluded from the analyses. One

person reported the same value for all questions, even the reversed ones, indicating that this

response was not reliable, for this reason the respondent was excluded. Finally, 30

respondents were eliminated from the main analysis because they completed less than 80% of

the survey. The final sample consisted of 177 participants. The proportion of men (49.72%)

and women within the sample was approximately equal, there was no significant association

between gender and sexuality ($X^2(1) = .006$, $p = .530$), see Table 1 for more descriptive

information. Furthermore, among the participants, 19.3% of men and 15.7% of women

received a vocational education or lower, whereas 30.7% of men and 48.3% of women

received a university education. Of all men, 37.5% works both part- and fulltime, of women;

27% works part-time and 41.6% is working fulltime.

Table 1

Sample characteristics reported for heterosexual and gay men, heterosexual and lesbian women

	Heterosexual men $N = 44$			Gay men $N = 44$			Heterosexual women $N = 45$			Lesbian women $N = 44$		
	M	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*
Age	23.30	2.42		23.34	2.62		22.89	2.20		23.02	2.58	
Followers	316.65[a]	161.33		835.50[a]	510.71		307.84[a]	168.10		281.58[a]	179.41	
Educational background												
Secondary vocational			9			8			8			6
Higher professional			24			20			12			20
University			11			16			25			18
Employment												
Fulltime			17			16			13			11
Part-time			15			18			19			18
None			12			10			13			15

Note. Mean scores (*M*) and standard deviations (*SD*) for age and Instagram followers, frequency (*n*) for education background and employment, [a] refers to detected and excluded outliers with boxplot.

Procedure

For this cross-sectional study, participants were recruited via announcements on the

author's Facebook and Instagram page, which were then shared with other users.

Additionally, on the author's request a local gay-bar in Utrecht, shared the recruitment

announcement on their Facebook page. The age range was limited from 18 to 26 because young adults are the most frequent Instagram users, and it has been suggested that people in this age range are at more risk for identity issues related to body image (Keel, Baxter, Heatherton, & Joiner, 2007; Newcom, 2018). To date, the majority of research samples included mostly female psychology undergraduates. In order to improve generalizability, this study did not focus on psychology students and included both men and women with a broader educational background. This study was conducted using SurveyMonkey online software. When participants opened the link from a computer device, they were first provided with written information about the study and asked for their consent. Participants were ensured of the anonymity of their participation. The measures were presented in the following order: demographics, Instagram usage, the Upward and Downward Appearance Comparison Scale and the Body Dissatisfaction subscale. Completion of the survey lasted approximately 5 to 10 minutes, and the survey was online for approximately one month. All participants were offered the chance to participate in a raffle in which they could win a €25,- gift card.

Materials

  Demographic variables. Participants were asked to fill out their age, gender, sexual orientation, land of birth, body mass index (BMI), educational level and employment. Respondents could declare to be either male or female. For sexual orientation, respondents were given the opportunity to identify themselves as heterosexual, homosexual, or other (i.e., open-ended; bisexual and pansexual were filled out). Further, a higher BMI could positively influence BD (Paxton, Eisenberg, & Neumark-Sztainer, 2006), to examine possible imbalanced BMI between study groups, respondents reported their current weight in kilograms and height in centimeters. To assess the number of followers each participant had, the following question was used: (e.g., "About how many total Instagram followers do you have right now?"; open-ended question).

Instagram usage. To assess participant's Instagram usage two questions were used. The first question was "How often do you check Instagram (even if you are logged on all day)?", which was scored on a scale from 0 to 13 (0= *not at all*, 1 = *every few days*, 2 = *once a day*, 3 = *every few hours*, 4 = *every hour*, 5 = *every 30 minutes*, 6 = *every 10 minutes*, and 7 = *every 5 minutes*). The second question, "Overall, how long do you spend on Instagram on a typical day?", was scored on a range from 0 to 12 (0 = *5 minutes or less*, 1 = *15 minutes*, 2 = *30 minutes*, 3 = *1 hour*, 4 = *2 hours*, 5 = *3 hours*, 6 = *4 hours*, 7 = *5 hours*, 8 = *6 hours*, 9 = *7 hours*, 10 = *8 hours*, 11 = *9 hours*, and 12 = *10 hours or more)*; adapted from Fardouly, Willburger, & Vartanian, 2018). The scale has a Cronbach's alpha of .76.

Appearance comparison. The Upward and Downward Appearance Comparison Scale (O'Brien et al., 2009) was used to assess participant's tendency to compare their appearance with others. The scale consisted out of two subscales, producing individual scores for respectively upward and downward appearance-based comparisons. The upward comparison subscale consists of 10 items, participants compare appearance with others whom they perceive to be better looking (e.g., "When I see good-looking people I wonder how I compare to them"). The downward comparison subscale consists of 8 items and compare to worse looking others (e.g., "I compare myself to people less good looking than me"). Each item was rated on a 5-point Likert scale ranging from 1 (*strongly disagree)* to 5 (*strongly agree*). Mean scores were used, with higher scores reflecting a greater tendency to engage in respectively upwards and downwards appearance-based comparison. For the purpose of this study this questionnaire was translated into Dutch. First, the author translated the questionnaire into Dutch, afterwards another researcher translated it back to English, and then the discrepancies were observed and corrected. The scales display good psychometric properties, both scales have good internal consistency and construct validity, this was

supported with other measures of physical appearance comparisons (O'Brien et al., 2009). In the current study the upward scale has a Cronbach's alpha of .90, and the downward scale has an alpha of .93.

Body dissatisfaction. The Body Dissatisfaction subscale of the Dutch version of the Eating Disorder Inventory 2 (EDI-2; Garner, 1991/2002; translated by van Strien) was used to assess how dissatisfied participants were with their bodies. The subscale contains 9 items scored on a 6-point scale ranging from 1 (*never*) to 6 (*always*), and included 5 reversed questions. For example: "I think that my thighs are too large". A higher total score indicated more BD. The subscale demonstrated good reliability throughout different studies, the validity of the whole EDI-2 is good (Garner, 2002). The Cronbach's alpha is .87 in the present study.

Data analyses

The correlational analyses that were conducted throughout this study were performed in IBM SPSS Statistics v25. A power analysis (G*power) revealed that 180 participants were necessary. To conduct the mediation analysis, Model 4 from PROCESS macro was used and approached on heterosexual men, gay men, heterosexual women and lesbian women (Hayes, 2017). A moderated mediation model was tested in which upward comparison and downward comparison were examined as concurrent mediators, and sexual orientation as a moderator of the relationship between Instagram usage and BD using a regression-based approach with Model 7 from PROCESS macro on both genders. Hayes's model was used and bootstrapped 5,000 times to derive total, direct and indirect effects (Hayes, 2017). Effect sizes of the model were evaluated using kappa-squared.

Results

Preliminary analyses

The descriptive statistics and intercorrelations for all study variables are displayed in Table 2. These results yield two implications: (1) the positive correlation between upward and downward comparison indicates that higher levels of comparison involve bi-directional increasements for both types of comparison, (2) since both upward and downward comparison are positively correlated to BD, this implies that more social comparison, regardless of its direction, is associated with more BD. A total of 12 missing values were detected. Closer examination revealed missingness not at random, as there were 10 missing values for one item. The specific question overlapped an earlier question by content. All missing values were replaced with multiple imputations (5 x bootstrapping) by taking the mean of the different imputed values. For the explorative variable BMI an independent t-test was conducted. Table 3 displays the mean scores of all groups. On average, gay men reported a significantly lower BMI than heterosexual men, $t(86) = 2.60$, $p < 0.05$.

Table 2

Means, Standard Deviations and correlations for variables

Variables	*M* (SD)	1	2	3	4
1. Instagram Usage	3.90 (*1.13*)	1	.14	.08	-.03
2. Upward Comparison	3.06 (*.83*)	.14	1	.55**	.33**
3. Downward Comparison	2.78 (.89)	.08	.55**	1	.31**
4. Body Dissatisfaction	2.86 (*.98*)	-.03	.33**	.31**	1

Note. **significant at $p < .01$.

Table 3

Means and Standard Deviations for BMI among all participants

	Heterosexual men (*n* = 44)		Gay men (*n* = 44)		Heterosexual women (*n* = 45)		Lesbian women (*n* = 44)	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
BMI	23.26*	3.21	21.72*	2.28	23.38	5.00	23.27	3.36

Note. BMI = body mass index,*significant at $p < .05$.

Men. Some significant differences were detected between heterosexual men and gay men on some key variables, see Table 4 for mean scores on all variables. Normality and

variance was equal within the sample, Levene's test was assumed. An independent sample t-test revealed that gay men scored significantly higher on average on Instagram usage than straight men, $t(86) = -3.59$, $p < 0.05$. On average, gay men also scored significantly higher on upward comparison than straight men, $t(86) = -4.22$, $p < 0.05$. Finally, gay men reported significantly more BD than heterosexual men, $t(86) = -2.53$, $p < 0.05$.

Women. Some significant differences were detected between heterosexual women and lesbian women= on some key variables. Normality and Levene's test were both assumed. See Table 4 for all mean scores on variables. On average, straight women scored significantly higher on upward comparison than lesbian women, $t(87) = 3.24$, $p < 0.05$. Further, mean score for straight women on downward comparison was significantly higher than for lesbian women, $t(87) = 2.10$, $p < 0.05$. Finally, the score for straight women was more significant on average than for lesbian women on BD, $t(87) = 2.52$, $p < 0.05$.

Table 4

Means and Standard Deviations for variables among all participants

Variables	IU		UC		DC		BD	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Men								
Hetero (*n* = 44)	3.67	*1.08*	2.73	*.70*	2.44	*.83*	2.25	*.74*
Gay (*n* = 44)	4.50*	*1.09*	3.39*	*.77*	2.80	*.91*	2.67*	*.82*
Women								
Hetero (*n* = 45)	3.81	*1.15*	3.34*	*.76*	3.13*	*.78*	3.51*	*.93*
Lesbian (*n* = 44)	3.63	*1.02*	2.77	*.88*	2.75	*.92*	3.00	*.96*

Note. IU = Instagram usage, UC = upward comparison, DC = downward comparison, BD = body dissatisfaction, *significant at $p < .05$ compared to their counterpart.

Examination of hypotheses

All hypotheses were tested using Hayes's Model 4 or 7 from PROCESS macro, using 5,000 bootstrap simulations. Because the shape of samples of indirect effects does not need to be met normally, Hayes recommends using unstandardized coefficients (Hayes, 2017). Subsequently, within every model mean centering data was conducted for all test. Sexual

orientation was dummy coded (0 = *heterosexual*, 1 = *non-heterosexual*) and entered as a moderator in Model 7.

Men. Hypothesis 1a expected that using more Instagram will predict more BD among gay men than for heterosexual men. However, no difference was found between heterosexual men (β = -0.12, SE = 0.11, p = .278) and gay men (β = 0.04, SE = 0.10, p = .692) in the relation between Instagram usage and BD. These results are not supporting this hypothesis.

To test hypothesis 1b, Model 4 was used to examine whether the relation between Instagram usage (X) and BD (Y) was mediated by downward comparison (M). Outcomes are presented in Table 5 and display the association between Instagram usage and BD (c-path), the effect of Instagram usage on downward comparison (a-path), the effect of downward comparison on BD and the association between Instagram usage and BD through downward comparison (c'-path). No significant mediating effect was found among heterosexual men (β = -0.11, t(41) = -0.99, p = .327). Hypothesis 1b was not supported.

Hypothesis 1c expected that upward comparison (M) would mediate the relationship between Instagram usage (X) and BD (Y). Again, Model 4 was used. The mediating effect was non-significant (β = 0.07, t(39) = 0.61, p = .545). Although, the a–path was not significant, the b-path was significant (β = 0.43, t(37) = 2.62, p = < .05). Contrary to hypothesis 1c, Table 5 indicate that no mediated effect was found for engaging in upward comparison.

Table 5

Model Coefficients for the mediation model among men

Heterosexual men (n = 43)

		M (DC)				Y (BD)		
		β	SE	p		β	SE	p
X (IU)	a	0.02	.13	.859	c	-.12	.11	.278
M (DC)		——	——	——	b	.08	.16	.610
Constant	i_1	2.32	.47	.000*	i_2	1.74	.60	.006*
					c'	-.11	.11	.327

R^2 = .00

$F(1,41)$ = .03, p = .859

R^2 = .12

$F(3,39)$ = 1.76, p = .170

Gay men (n = 41)

		M (UC)				Y (BD)		
		β	SE	p		β	SE	p
X (IU)	a	.05	.11	.680	c	.04	.10	.692
M (UC)		——	——	——	b	.43	.17	.013*
Constant	i_1	3.17	.11	.000*	i_2	.89	.67	.194
					c'	.07	.11	.545

R^2 = 0.00

$F(1,39)$ = 0.17, p = .680

R^2 = 0.21

$F(3,37)$ = 3.26 , p = .032*

Note. DC = downward comparison, BD = body dissatisfaction, IU = Instagram usage,
UC = upward comparison, 4 outliers were excluded using Mahalanobis distance $p < .05$,
*significant at $p < .05$.

Hypothesis 2 expected that either upward comparison (M_1) or downward comparison

(M_2) moderated by sexual orientation (W), would mediate the relationship between Instagram

usage (X) and BD (Y). Model 7 was used, see Figure 1. The conditional indirect effects of

Instagram usage on BD through upward/downward comparison were of interest. When the

bias corrected confidence interval does not include zero, a moderation is present for the

conditional effects (Preacher, Rucker & Hayes, 2007). As can be seen in Table 6, no

significant effect was found for the moderated mediation and conditional indirect effects. No

support for hypothesis 2 is found, indicating that sexual orientation did not moderate the

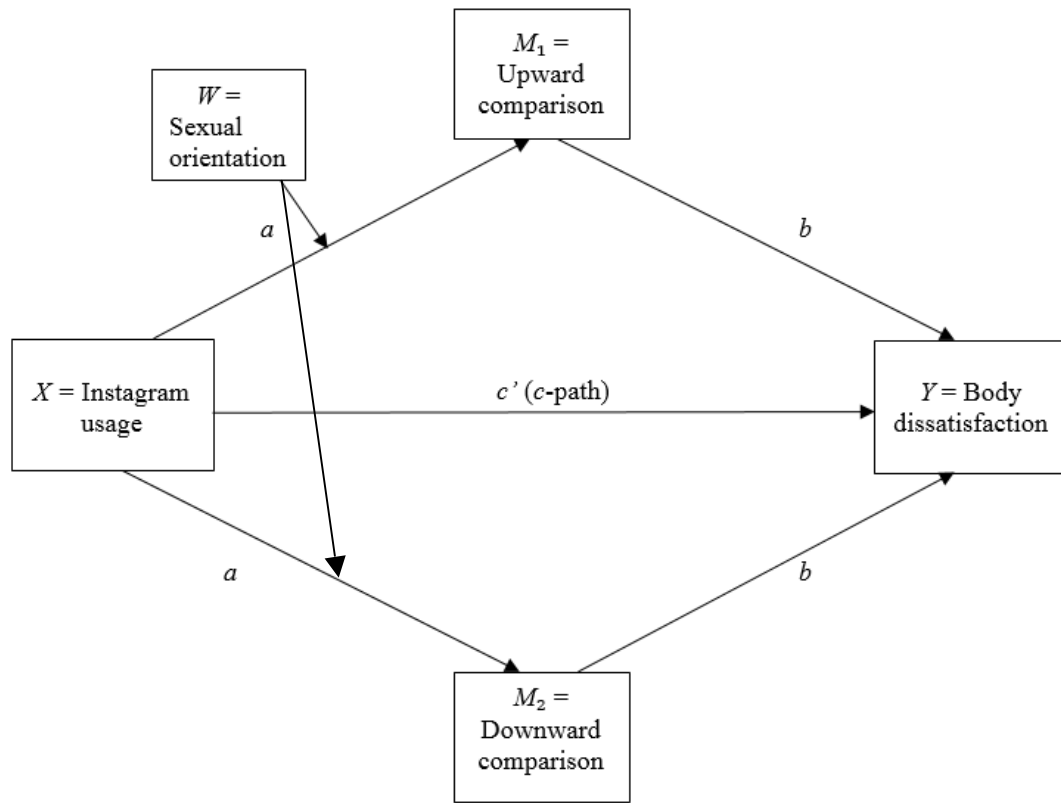relationship between Instagram usage and BD through a comparison style.

Figure 1. Moderated mediation model for men/women.

Table 6

Ordinary least squares regression coefficients (with standard errors) from a moderated mediation model among men (N= 84)

			Outcome		
		M_1: Upward	M_2: Downward		Y: Body Dissatisfaction
Constant		2.73 (.11)*	2.41 (.13)*		1.05 (.33)*
X: Inst. Use	$a_1 \rightarrow$	.03 (.11)	.02 (.12)	$c' \rightarrow$	-.01 (.07)
W: Sexual Orient.	$a_2 \rightarrow$	.62 (.16)*	.23 (.19)		
XW: Inst. Use X Sexual Orient.	$a_3 \rightarrow$	.02 (.15)	.12 (.18)		
M1: Upward				$b_1 \rightarrow$	.40 (.11)*
M2: Downward				$b_2 \rightarrow$	.06 (.10)
	R^2	.18*	.05		.20*

		Index	95% Bootstrap CI[a]
Moderated mediation M_1		0.007	-0.115 to 0.118
Moderated mediation M_2		0.007	-0.032 to 0.088
Conditional moderated mediation	Hetero (W) M_1	0.011	-0.071 to 0.105
by sexual orient. (W)	Lesbian (W_1) M_1	0.018	-0.062 to 0.088
	W M_2	0.001	-0.038 to 0.036
	W_1 M_2	0.009	-0.026 to 0.073

Note. [a] refers to percentile bootstrap CI based on 5,000 bootstrap samples, 4 outliers were excluded using Mahalanobis distance $p < .05$, *significant at $p < .05$.

Women. Hypothesis 3a expected that more use of Instagram will predict more BD among heterosexual women and lesbian women. As was expected, no difference was found between heterosexual (β = -0.08, *SE* = 0.14, *p* = .593) and lesbian women (β = 0.12, *SE* = 0.13, *p* = .382), also no significant difference was found between Instagram usage and BD. Hypothesis 3a was not supported .

Hypothesis 3b expected that upward comparison (M) would mediate the relationship between Instagram usage (X) and BD (Y). A parallel analyses was conducted for both heterosexual and lesbian women with Model 4. Outcomes are displayed in Table 7. No significant mediating effect was found among heterosexual women (β = -0.07, *t*(42) = -0.45, *p* = .656). Among lesbian women, results indicated that the mediator, upward comparison, was positively associated with BD (β = 0.33, *t*(39) = 2.49, *p* < .05). Although the a-path was not significant, the b-path was significant. Table 7 indicates that the c'-path of the association between Instagram usage and BD remained non-significant (β = 0.17, *t*(40) = 1.46, *p* = .152) for engaging in upward comparison, thus not suggesting mediation. Hypothesis 3b was thus not supported.

Table 7

Model Coefficients for mediation model among women

Heterosexual women (n = 44)

		M (UC)				Y (BD)		
		β	SE	p		β	SE	p
X (IU)	a	.03	.12	.807	c	-.08	.14	.593
M (UC)		——	——	——	b	.35	.18	.055
Constant	i_1	3.13	.47	.000*	i_2	2.64	.79	.002*
					c'	-.07	.15	.656
		$R^2 = .00$				$R^2 = .09$		
		$F(1,40) = .06, p = .807$				$F(2,41) = 2.06, p = .141$		

Lesbian women (n = 42)

		M (UC)				Y (BD)		
		β	SE	p		β	SE	p
X (IU)	a	.12	.13	.328	c	.13	.11	.258
M (UC)		——	——	——	b	.33	.13	.017*
Constant	i_1	2.30	.51	.000*	i_2	1.51	.52	.006*
					c'	.17	.12	.152
		$R^2 = .02$				$R^2 = .18$		
		$F(1,40) = .98, p = .328$				$F(2,39) = 4.30 , p = .021*$		

Note. UC = upward comparison, BD = body dissatisfaction, IU = Instagram usage, 3 outliers were excluded using Mahalanobis distance $p < .05$, *significant at $p < .05$.

Hypothesis 4 expected that either upward comparison (M_1) or downward comparison (M_2) moderated by sexual orientation (W), would mediate the relationship between Instagram usage (X) and BD (Y). Model 7 was again used to examine this prediction. The conditional indirect effects of Instagram usage on BD through upward comparison were of interest. As can be seen in Table 8, no significant effect was found for the moderated mediation and conditional indirect effects, which is in contrast with hypothesis 4.

Table 8

Ordinary least squares regression coefficients (with standard errors) from a moderated mediation model using the Instagram effect data for women (N= 86)

				Outcome		
		M_1: Upward	M_2: Downward		Y: Body Dissatisfaction	
Constant		2.79 (.13)*	2.73 (.13)*		1.80 (.37)*	
X: Inst. Use	$a_1 \rightarrow$	.13 (.13)	-.17 (.13)	$c' \rightarrow$	.05 (.09)	
W: Sexual Orient.	$a_2 \rightarrow$	.54 (.18)*	.38 (.18)*			
XW: Inst. Use X Sexual Orient.	$a_3 \rightarrow$	-.10 (.18)	.20 (.18)			
$M1$: Upward				$b_1 \rightarrow$	.36 (.14)*	
$M2$: Downward				$b_2 \rightarrow$	.11 (.18)	
	R^2	.11*	.07		.18*	

			Index	95% Bootstrap CI[a]
Moderated mediation M_1			-0.037	-0.205 to 0.100
Moderated mediation M_2			0.021	-0.045 to 0.101
Conditional moderated mediation	Hetero (W) M_1		0.048	-0.056 to 0.171
by sexual orientation (W)	Lesbian (W_1) M_1		0.011	-0.102 to 0.109
	W M_2		-0.017	-0.083 to 0.031
	W_1 M_2		0.004	-0.044 to 0.044

Note. [a] refers to percentile bootstrap CI based on 5,000 bootstrap samples, 3 outliers were excluded using Mahalanobis distance $p < .05$, *significant at $p < .05$.

Discussion

The aim of this study was to examine the relationships between Instagram usage, sexual orientation, appearance comparisons and BD among men and women. Recent research provides evidence that exposure to photos on social media is associated with body image concerns (Fardouly & Vartanian, 2015; Holland & Tiggeman, 2016). A total of four hypotheses were examined among men and women. Contrary to expectations, the relation between Instagram activity and comparisons to other appearances, were not related to BD for both genders. However, gay men and lesbian women report a stronger tendency to use an upward comparison style than their counterparts. Both groups also declared to experience more BD when comparing themselves with people they perceived as more good looking than themselves. Together, the present findings do not provide support of the proposed model. More activity on Instagram was not positively related to body image concerns, albeit a small

effect was detected for gay men and lesbian women, which implicated that they were more inclined to compare themselves upwards with others, which was related to more BD.

Overall, the findings of this study indicate that upward comparison is related to bodily issues and this relation decreases if you are a heterosexual man, and increases if you are a gay man or lesbian woman. There might be some reasoning for these findings. First of all, in line with the study of Fardouly, Pinkus and Vartanian (2017), upward comparisons appeared to be more used than downward comparisons. This could refer to people's aspiration to improve themselves, in order to become their desired, ideal self. As people will experience a discrepancy when they perceive others as better, they might become more conscious about their actual self and may aspire an ideal self of how they want to be (i.e., self-discrepancy; Higgins, 1987). This process is associated with negative consequences (Wood, 1989), and might explain greater levels of BD. Secondly, in line with our expectations, gay men reported on average more concerns about their bodies than heterosexual men. Similar differences as in the meta-analysis of Morrison, Morrison and Sager (2004) were found between gay and straight men in the present study. A possible explanation for this might be that gay men are more conscious about their own appearance and put many focus on the look of others, which could evoke a stressor for acceptation in appearance and may lead to more BD (Legenbauer et al., 2009; Yelland & Tiggemann, 2003). This relation could be even more pressured in gay communities where the ideal picture focuses on a muscular and physically fit form (Hargreaves & Tiggemann, 2009), which could cause emotional and psychological damage (Shernoff, 2002). Although non-heterosexual men had much lower BMIs than heterosexual men, the level of BD was also much higher among gay men than among heterosexual men. This suggests that even though gay men had smaller bodies, they still experience more concerns about their body image, which indicates a possible desire for a more muscled tone. This result is in line with the outcome of the study of Paplau et al. (2009) who found that gay

men, despite a higher BMI, experience more dissatisfaction. Vogel, Rose, Okdie, Eckles, and Franz (2014) revealed that a person's self-esteem is related to the frequency of an upward comparison style. Gay men who engaged in more upward comparisons, which was expected in our hypothesis, might have lower levels of self-esteem. This will probably maintain the upward style and body issues even with a 'lower' BMI.

Notwithstanding that straight and lesbian women had almost the similar average level of BMI, straight women showed more dissatisfaction about their bodies than lesbian women. This is in line with meta-analysis of Morrison et al. (2004). Despite the fact that heterosexual women on average reported more use of upward comparisons and reported higher levels of BD, it were lesbian women who showed a stronger relation between those dimensions compared to their counterparts. This might be due to lesbian women experiencing more severe pressure of the sociocultural influence on their body image than some theorists thought (Brown, 1987). Present findings indicate that women regardless of sexuality are vulnerable for idealized physical appearances from cultural and media pressures (Dworkin, 1998; Rothblum, 1994). Furthermore, women whom have a lower self-esteem may compare themselves to others they desire to be look like (Martinot & Redersdorff, 2006). This is what Festinger (1954) called the "unidirectional drive upward", which refers for a preference to make upward comparisons to notice the strategies the 'superior' others used, for improving yourself in that particular domain. In this line of thinking: in order to evaluate an own appearance to improve a look this will probably goes parallel with uncomfortableness and dissatisfaction at first, before people get in action to enhance their appearance until they become satisfied. Finally, another explanation for the level of body concerns among gay men might be found in the difference between the number of followers on Instagram. Compared to all sample populations, gay men had the highest number of followers on average, this might suggest that they are more likely to engage in comparisons which could relate to BD.

Tiggemann and Slater (2013) found this association for the number of friends on Facebook in relation to body concerns among both men and women. In summary, current findings reveal that heterosexual men were most satisfied, and gay men and heterosexual/lesbian women were most dissatisfied about their bodies.

Contrary to our hypothesis, total time on Instagram was not related to BD. In contrast with former research that demonstrate a connection between social media use and body image concerns (Haferkamp & Krämer, 2011; Manago, Ward, Lemm, Reed, & Seabrook, 2015), no positive association was found in this study. Moreover, present study shows a negative correlation between Instagram usage and BD. However, in line with research of Meier and Gray (2014), who did not found a relation of total time on Facebook and body concerns either, they concluded that body concerns in relation to Facebook was related to the visit's intention on Facebook (e.g., posting photos, scrolling, chatting). A limitation in the present study is that behavior on Instagram, such as uploading pictures, liking photos, commenting and chatting, were not taken into consideration. To get a better vision on the relation between online behavior and BD, it might be fruitful to additionally include measurements of active social media behavior, in order to create a more complete image of the state of the art. Another limitation of this study is that there is no insight in the content of what users follow on Instagram. It would be valuable to examine the differences between the accounts contents, to make a more precise observation about the theme of photos. For example, if someone follows travel accounts compared to someone who follows attractive peers, this difference could influence the relation of Instagram use and BD (Sherlock & Wagstaff, 2018). For future research, it is recommended to include a measurement about the account's content for more insight, and discover if Instagram's attractive peer content is as strong as traditional media's influence on body image. Another explanation for the absence of a relation between Instagram use and body concerns might be found in the awareness to spot

fake or edited photos, which might be evoked by the photo-enhancing tools and editing possibilities that are provided on Instagram. As a result, the reliability of the presented pictures on Instagram might be questioned by the perceiver, which in turn could protect oneself from body image harm. However, users may not have this awareness, future research should examine this. Further, it is also a limitation that the upward and downward comparison questionnaire was not specified to Instagram situations, people may not have identified themselves in the questions and this could negatively influence the findings of this study. This should be adjusted in future research. A strong aspect of this study is that the sample existed of people from age range 18 to 27 and approximately three-third of the participants worked part-time, fulltime or were students, this increases the generalizability. Present study was limited by reliance of self-report and lack of long-term conclusions. Future research could design an experimental study, with for example eye tracking while participants check Instagram to make more reliable observations about users Instagram behavior.

      The findings of the present study indicate that the majority of comparisons is in an upward way and is more frequently used among gay men and heterosexual women. Additionally, body concerns seem to be more common among gay men and both heterosexual and lesbian women. Furthermore, an association between upward comparison and BD is related to each other for both gay men and lesbian women. Because of the correlational design of the present study, causation cannot be inferred, and it is possible that making more upward comparisons increases body issues, or more dissatisfaction about the body will lead to more upward comparison tendencies. Future studies should have a longitudinal or experimental design to gain more insight in the relation between Instagram usage, sexual orientation, appearance comparisons and body concerns. The present study aims to emphasize the importance of examining differences in sexual orientations, and not only in

gender, as a fruitful avenue for future research within this field. As such, it contributes to a more sophisticated representation of modern society.

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Appendix A

Demographic Questionnaire

1. Wat is uw leeftijd? (In dit veld mogen alleen cijfers ingevoerd worden): (open antwoord)

2. Wat is uw geslacht?: (0 = man, 1 = vrouw)

3. Wat is je seksuele geaardheid? (0 = Heteroseksueel, 1 = Homoseksueel/lesbisch, 2 = anders; open antwoord)

4. Wat is je hoogst genoten, of huidige opleidingsniveau? : (0 = geen opleiding, 1 = Lagere school, 2 = Lager beroepsonderwijs, VMBO basisberoepsgerichte of kaderberoepsgerichte leerweg, 3 = VMBO theoretische of gemengde leerweg, 4 = HAVO, VWO, Gymnasium, 5 = MBO, 6 = HBO, 8 = Universiteit)

5. Ben je op dit moment in dienstverband? (0 = ja fulltime, 1 = ja parttime, 2 = nee)

6. Wat is je land van herkomst?: (open antwoord)

7. Wat is je lengte in centimeters? (In dit veld mogen alleen cijfers ingevoerd worden, bijvoorbeeld; 182): (open antwoord)

8. Wat is je gewicht in kilo's? (In dit veld mogen alleen cijfers ingevoerd worden, bijvoorbeeld; 75): (open antwoord)

9. Ben je op dit moment 6 maanden of langer actief op Instagram? (0 = ja. 1 = nee)

Appendix B

Instagram Usage Questionnaire

1. Hoe vaak check je Instagram (zelfs wanneer je de hele dag bent ingelogd)?

(0 = helemaal niet, 1 = elke paar dagen, 2 = eens per dag, 3 = elke paar uur, 4 = ieder

uur, 5 = iedere 30 minuten, 6 = iedere 10 minuten, 7 = iedere 5 minuten)

2.Hoelang besteed je op Instagram op een normale dag?

(0 = minder dan 5 minuten, 1 = 15 minuten, 2 = 30 minuten, 3 = 1 uur, 4 = 2 uur, 5 =

3 uur, 6 = 4 uur, 7 = 5 uur, 8 = 6 uur, 9 = 7 uur, 10 = 8 uur, 11 = 9 uur, 12 = meer dan

10 uur)

Followers. 1. Hoeveel volgers in totaal heb je op dit moment op Instagram? (In dit

veld mogen alleen cijfers ingevoerd worden): (open antwoord)

Appendix C

Appearance Comparison; Upward and Downward Questionnaire

Geef bij onderstaande stellingen aan wat het beste past bij wat jij denkt.

1. Ik vergelijk mijzelf liever met anderen die er beter uitzien dan ik, dan met degenen die dat niet zijn: (1 = helemaal mee oneens, 2 = oneens, 3 = niet mee eens, niet mee oneens, 4 = eens, 5 = helemaal mee eens)

2. Ik heb de neiging om mijn eigen fysieke aantrekkelijkheid te vergelijken met die van modellen uit magazines: (1 = helemaal mee oneens - 5 = helemaal mee eens)

3. Ik merk dat ik erover nadenk of mijn eigen uiterlijk goed vergelijkbaar is met die van modellen en filmsterren: (1 = helemaal mee oneens - 5 = helemaal mee eens)

4. Op het strand of atletische activiteiten (sport, fitness, etc.) vraag ik mijzelf af of mijn lichaam net zo aantrekkelijk is als de mensen die ik daar zie met hele aantrekkelijke lichamen: (1 = helemaal mee oneens - 5 = helemaal mee eens)

5. Ik neig mijzelf te vergelijken met mensen waarvan ik denk dat ze er beter uitzien dan ik: (1 = helemaal mee oneens - 5 = helemaal mee eens)

6. Wanneer ik een persoon zie met een goed lichaam, neig ik ernaar mijzelf af te vragen hoe ik 'overeenkom' met hen: (1 = helemaal mee oneens - 5 = helemaal mee eens)

7. Wanneer ik goed uitziende mensen zie vraag ik mijzelf af hoe ik mij verhoud tegenover hen: (1 = helemaal mee oneens - 5 = helemaal mee eens)

8. Op feestjes of andere sociale evenementen vergelijk ik mijn fysieke voorkomen met het fysieke voorkomen van de erg aantrekkelijke mensen: (1 = helemaal mee oneens – 5 = helemaal mee eens)

9. Ik merk op dat ik mijn verschijning vergelijk met mensen die er beter uitzien dan ik: (1 = helemaal mee oneens - 5 = helemaal mee eens)

10. Ik vergelijk mijn lichaam met mensen die een beter lichaam hebben dan ik: (1 = helemaal mee oneens - 5 = helemaal mee eens)

Geef bij onderstaande stellingen aan wat het beste past bij wat jij denkt.

11. Wanneer ik een fysiek onaantrekkelijk persoon zie, denk ik erover na hoe mijn lichaam zich verhoudt met dat van hen: (1 = helemaal mee oneens - 5 = helemaal mee eens)

12. Ik neig ernaar mijn lichaam te vergelijken met degenen die een beneden gemiddeld lichaam hebben: (1 = helemaal mee oneens - 5 = helemaal mee eens)

13. Op het strand, fitness of sport evenementen vergelijk ik mijn lichaam met degenen die een minder atletisch lichaam hebben: (1 = helemaal mee oneens - 5 = helemaal mee eens)

14. Ik vergelijk mijzelf met mensen die er minder goed uitzien dan ik: (1 = helemaal mee oneens - 5 = helemaal mee eens)

15. Ik denk erover na hoe aantrekkelijk mijn lichaam vergeleken met mensen met overgewicht (1 = helemaal mee oneens - 5 = helemaal mee eens)

16. Op feestjes vergelijk ik mijn looks vaak met de looks van onaantrekkelijke mensen: (1 = helemaal mee oneens - 5 = helemaal mee eens)

17. Ik vergelijk mijzelf vaak met degenen die fysiek minder aantrekkelijk zijn: (1 = helemaal mee oneens - 5 = helemaal mee eens)

18. Ik neig ernaar mijn fysieke voorkomen te vergelijken met mensen wiens lichamen niet zo fysiek aantrekkelijk zijn: (1 = helemaal mee oneens - 5 = helemaal mee eens)

Appendix D

Body Dissatisfaction Questionnaire

De volgende vragen gaan over meningen en gevoelens. Er zijn geen goede of foute

antwoorden, dus probeer zo eerlijk mogelijk te zijn in je antwoorden. Geef aan wat

het beste op jou van toepassing is. Sla alsjeblieft geen vragen over.

 1. Ik vind mijn buik te dik: (1 = nooit, 2 = zelden, 3 = soms, 4 = vaak, 5 = meestal, 6 = altijd)

2. Ik vind mijn dijen te dik: (1 = nooit – 6 = altijd)

3. Ik vind dat mijn buik precies de juiste maat heeft: (1 = nooit – 6 = altijd)

4. Ik ben tevreden met de vorm van mijn lichaam: (1 = nooit – 6 = altijd)

5. De vorm van mijn billen bevalt mij: (1 = nooit – 6 = altijd)

6. Ik vind mijn heupen te breed: (1 = nooit – 6 = altijd)

7. Ik vind dat mijn dijen precies de juiste omvang hebben: (1 = nooit – 6 = altijd)

8. Ik vind mijn billen te dik (1 = nooit – 6 = altijd)

9. Ik vind mijn heupen precies de juiste maat hebben (1 = nooit – 6 = altijd)