The association between frequent online dating app use and online objectification

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Abstract

In this study, the association between frequency of online dating app use and self-objectification, mental well-being, self-esteem and body satisfaction was examined through analysis of secondary data of a cross sectional survey study. This study also examined whether these associations were moderated by gender or sexual orientation. A total of 165 participants were included who all used online dating apps or had used them in the past. Through Spearman's Rho analysis no significant associations were found of frequency of online dating app use on self-objectification. Also regression analysis showed very little evidence for moderation; only an effect was found for gender between the association of frequency of use and self-esteem. Results implicate that the objectification theory framework might not be explanatory for the relationship between frequency of use and objectification. Further research is recommended in order to investigate if the sociocultural theory framework may be more suitable to understand the relationship between frequent online dating app use and objectification instead. Future recommendations are research into the relationship between frequency of use of dating apps and self-esteem to see if this relationship is mediated by self-objectification/body surveillance of trough (appearance based) rejection and the conduction of a longitudinal panel study with multiple waves to assess the associations between online dating app use and different psychological and body image indicators over time with a large and diverse group of respondents to be able to make inference about the associations over time for these groups.

Keywords: Online dating apps, frequency of use, self-objectification, mental well-being, self-esteem, body satisfaction, sexual minority, gender.

Introduction

Online dating is 'big business' with an estimated annual revenue of 1.9 billion dollars worldwide (Matthews, 2018). Online dating has been around for many years with popular websites like Match.com already launching in 1995. In 2007, location-based online dating apps first appeared on the market (Bonilla-Zorita, Griffiths & Kuss, 2020).

One of those online dating apps is Tinder, which has been around since 2012. Tinder is regarded as the biggest online dating app with an estimated 100 million downloads of the app and 10 million active daily users (March, Grieve, Marrington & Jonason, 2017), indicating the widespread use of online dating apps.

The popularity of dating apps

The use of online dating apps provides some benefits compared to traditional dating. In a study of Clemens, Atkins and Krishnan (2015) it was found, for example, that online dating increases the chance of finding a partner of the same sexual orientation or religious affiliation. In addition, Finkel, Eastwick, Karney, Reis and Sprecher (2012) showed that online dating provides a bigger network of potential suitable partners compared to traditional dating. Users of online dating apps may thus experience some benefits compared to traditional dating.

Potential downsides of the use of dating apps

However, the use of dating apps has also been associated with an increase in certain risk behaviours. For example, Sawyer, Smith and Benotsch (2018) found that undergraduate heterosexual students who used dating apps showed higher rates of sexual risk behaviours. Furthermore, Carpenter and McEwan (2016) showed that among undergraduate students,

those who used Tinder, scored higher on personality traits such as impulsiveness and sensation seeking.

The relationship between dating apps and mental health

In addition to the increase in risk behaviours some studies indicate that the use of online dating apps is associated with potential negative effects on mental health and body image. Tinder users were found to report lower levels of satisfaction with their face and bodies, higher levels of body shame, body surveillance, appearance comparisons and internalization that non-users (Strubel & Petrie, 2017). Interestingly, especially male Tinder users showed significantly lower levels of self-esteem compared to non-users (Strubel & Petrie, 2017). Furthermore, Breslow et al. (2020) found that more online objectification among sexual minority men was associated with more body surveillance which in turn negatively associated with body satisfaction and self-esteem. A sexual minority is defined as; people with same-sex attraction, behaviours, or identities such as gay, lesbian, bisexual or unsure (Horwitz et al., 2021). In conclusion, although the use of online dating apps provides some benefits, there is also considerable research indicating detrimental effects on its users, such as increased sexual risk taking and negative effects on mental health.

Objectification theory

The objectification theory states that women internalize an outside observer's perspective of their physical selves (Fredrickson & Roberts, 1997). This internalization experience can lead to an increased awareness of physical appearance among women. Women then perceive themselves as objects that are evaluated on the sole basis of their physical appearance (i.e., self-objectification). The objectification theory provides a framework that explains how sexually objectifying experiences that women encounter when they are sexually

objectified by visual media affect self-objectification (Fredrickson & Roberts, 1997). It is found that online dating app use can lead to more self-objectification, body shame and body surveillance and less body satisfaction (Breslow et al., 2020; Strubel & Petrie 2017).

Self-objectification and mental health

Self-objectification can lead to mental health problems like depression, disordered eating and sexual dysfunctions (Fredrickson & Roberts, 1997; Moradi & Huang, 2008). The latter found that this process of self-objectification was mainly manifested as body surveillance which is described as "habitual monitoring of the body's outward appearance" (Fredrickson & Roberts, 1997, p. 180). Self-objectification in the form of body surveillance is associated with an increase in body shame and anxiety and a decrease in flow experiences and internal bodily awareness which in turn affect the aforementioned mental health problems as shown in Figure 1 (Fredrickson & Roberts, 1997; Moradi & Haung, 2008).
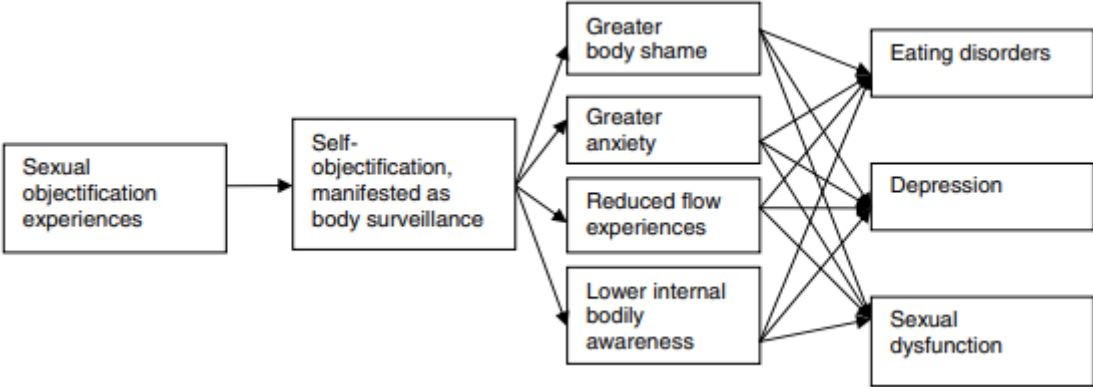

Figure 1. Objectification theory framework (Moradi & Huang, 2008)

Frequency of online dating app use

In the context of the objectification theory, the frequency of online dating app use may play an important role. In particular, more frequency of online dating app use could

theoretically increases the number of objectifying experiences which leads to more self-objectification which in turn negatively affects body shame and mental health (Fredrickson & Roberts, 1997).

However, there is no conclusive evidence that shows the negative effects of frequently using dating apps on the user's mental health and body image. In the study of Breslow et al. (2020) no significant association was found between frequency of online dating apps use and body satisfaction or self-esteem. Contrarily, Anderson, Holland, Koc and Haslam (2018) found that a greater frequency in using Grindr to find sexual partners was associated with more self-objectification and less body satisfaction. A study of Griffiths, Murray and McLean (2018) also showed that sexual minority men who used social media more often, particularly image centric social media, were subjected to greater body dissatisfaction. Lastly, Strubel and Petrie (2017) suggested that a frequent use of dating apps could influence psychosocial distress. To sum up, conclusive evidence of the relationship between frequency of dating apps and mental health and body image has been lacking.

Limited research has been done on how the frequency of the use of online dating apps relates to body image and mental well-being and the results that were found are inconclusive. With 10 million active users per day (March et al., 2017), it is crucial to be able to conclusively indicate the possible detrimental effects of frequently using online dating apps on self-objectification. Moreover, according to the objectification theory, self-objectification could also be related to the development of eating disorders, depression and sexual dysfunctions (Fredrickson & Roberts, 1997). The present research will therefore explore how frequency of online dating app use is associated with self-objectification, mental well-being, self-esteem and body satisfaction to get a better understanding of this relationship.

Self-objectification, mental well-being, self-esteem and body satisfaction

Frequency of online dating app use and the association with self-objectification

It has been argued that the process of self-objectification can occur through the use of online dating apps since people are often evaluated by others on the basis of their appearance. Similarly, in a study of Schaefer et al. (2018), it was found that when women are repeatedly objectified through Social Networking Sites (SNS), they perceive themselves more as objects and assign more importance to their appearance. Findings of Strubel and Petrie (2018) among Tinder users were consistent with those of Holland & Tiggermann (2016) and showed a direct relationship between involvement in Tinder and indications of body image concerns, psychosocial distress and disordered eating. Furthermore, Karsay, Knoll and Matthes (2018) found that witnessing and being exposed to objectification through media use did not only cause women to develop an objectified self-concept, but also men. In conclusion, self-objectification might be associated with more frequency of online dating apps use which leads to more objectifying experiences and increases self-objectification.

Frequency of online dating app use and the association with body satisfaction

The objectification theory states that self-objectification through body surveillance is related to body shame (Fredrickson & Roberts, 1997). Similar effects have been found in research concerning social media (Fardouly & Vartanian, 2016; Haferkamp & Kramer, 2011; Manago, Ward, Lemm, Reed & Seabrook, 2015). Haferkamp and Kramer (2011) found that both men and women had a decrease in body satisfaction after being exposed to attractive Facebook profiles. This is in line with the findings of Fardouly and Vartanian (2016) who found that the use of social media is negatively related to body image concerns like body dissatisfaction and shame. This is particularly true for users who engage in activities in which

appearance comparisons to others were made. Consequently, both male and female Tinder users report more body shame than non-users (Strubel & Petrie, 2017). Body shame can be defined as the shame that someone feels about their own body or any body part (Cella, Iannaccone & Cotrufo, 2020). If someone perceives body shame this will cause dissatisfaction about their own body. Body shame can thus also be described as having shameful and dissatisfactory feelings towards one's own body. Therefore, body shame is related to body dissatisfaction and negatively related to body satisfaction. Body satisfaction is included as a factor as it is hypothesized that a higher frequency of dating app use negatively associates with body satisfaction.

Frequency of online dating app use and the association with self-esteem

The process of self-objectification through online dating app use could relate to lower self-esteem. In a study of Strubel and Petrie (2017), it was found that male users of the app Tinder had significantly lower levels of self-esteem than non-users. The self-esteem of men thus seems to be negatively associated with a frequent online dating app use.

For woman similar effects were found in a study of SNS use. This study showed that female adolescent SNS users had lower self-esteem than female non-users (Blomfield Neira & Barber, 2014). The study of Schaefer et al. (2018) showed that repeated objectification through SNS use can occur for women and can lead to self-objectification. It is hypothesized that this repeated exposure to online dating apps can also lead to self-objectification which in turn affects self-esteem. It is hypothesized that a higher frequency of online dating apps use decreases self-esteem. Self-esteem is therefore also included as a measure to be able to study the impact that frequency of online dating app use has on self-esteem.

Frequency of online dating app use and the association with mental well-being

As discussed earlier, frequency of online dating app use might be related to more self-objectification (Karsay et al., 2018). According to the objectification theory, self-objectification ultimately increases the risk of mental health problems such as depression and eating disorders (Fredrickson & Roberts, 1997). The increase of these mental health problems could negatively affect mental well-being. Lamers, Westerhof, Glas and Bohlmeijer (2015) found that, even though they are separated constructs, there is a bidirectional relationship between positive mental health and psychopathology. The presence of a mental disorder affects positive mental health and conversely positive mental health predicts the presence of mental disorders. It is hypothesized that the process of self-objectification could occur through a higher frequency of online dating app use. This could contribute to mental health problems like eating disorders and depression according to the objectification theory and influence the level of positive mental health. To be able to conclusively tell the role of mental well-being, it is included as a factor.

The moderating role of gender and sexual orientation

It is relevant to know how online dating app use affects people from different gender and sexual orientation to be able to determine the possible risks of more frequent online dating app use for different groups. The original objectification theory framework that was designed for women's self-objectifying experiences, related these experiences to negative health consequences like depression and eating disorders (Fredrickson & Roberts, 1997; Moradi & Haung, 2008). These mental health problems are more prevalent among women than men (Moradi & Huang, 2008). Also, women report higher levels of self-objectification, body shame and surveillance than men (Moradi & Huang, 2008). Thus, men are less likely to

self-objectify and perceive less mental health problems as a result of this. It is therefore hypothesized that for women there will be a stronger association between self-objectification, mental well-being, self-esteem and body satisfaction after and frequency of online dating app use then for men.

Although objectification theory was originally developed to provide a framework exclusively for women's experiences, it might also be applicable for the experiences of non-heterosexual men. Studies found that both woman and sexual-minority men perceived body dissatisfaction, though their ideals differed; Woman strive to be thin whereas sexual minority men strive to be more muscular (Breslow et al., 2020; Kozak, Frankenhauser & Roberts, 2009). Objectification theory has been found to provide an explanation for the objectification process that occurs among gay men as they are more likely to self-objectify themselves than heterosexual men (Kozak et al., 2009; Martins, Tiggerman & Kirkbride, 2007). It was also found that for gay men, but not for heterosexual men, self-objectification was related to body shame (Martins et al., 2007). This is in line with a recent study in which the authors concluded that the objectification theory framework provides a fit for online dating experiences of non-heterosexual men (Breslow et al., 2020).

Studies have also been done to the applicability of the objectification theory framework for non-heterosexual women. The results are inconclusive. There is support for the generalizability for the objectification theory for lesbian women (Moradi & Huang, 2008). However, studies also found that lesbian women show a greater level of body surveillance compared to heterosexual women (Kozee & Tylka, 2006). This is contrary to the findings of Hill and Fischer (2008) who found that lesbian women reported similar levels of self-objectification compared to heterosexual women, but significantly less body surveillance. It

thus seems that lesbian women experience self-objectification to a similar level as heterosexual women, but the evidence about body surveillance seems inconclusive.

It is hypothesized that for sexual minority people there is a stronger association between online dating app use and self-objectification, mental well-being, self-esteem and body satisfaction compared to heterosexual people.

Research question and hypotheses

The present study will aim to provide an answer to the following research question:

RQ: To what extent is frequency of online dating app use associated with self-objectification, mental well-being, self-esteem and body satisfaction and to what degree is this association moderated by gender or sexual orientation?

The following two hypotheses are tested:

H1: Frequency of online dating app use is associated with more self-objectification and less mental well-being, self-esteem and body satisfaction

H2: For women and sexual minority people there is a stronger association between frequency of online dating app use and self-objectification, mental well-being, self-esteem and body satisfaction than for men and heterosexual people.

Methods

Design

The current study is a secondary analysis of a larger survey study about online dating and mental health, conducted by students of the University of Twente (Feasing, 2020; Labes, 2020; Malz, 2020). This study explores the associations between frequency of online dating app use and self-objectification, mental health, self-esteem and body satisfaction and whether these associations are moderated by gender and/or sexual orientation.

Description of the original dataset

Participants were obtained via a convenience sample between the 31st of March and the 12th of April 2020. In the original study participants were recruited via the Sona Systems platform of the Behavioural, Management and Social Sciences (BMS) faculty of the University of Twente. They received a link to the questionnaire that was distributed through messages of the researchers and social networking sites. A total of 264 participants were recruited. The majority of the participants were young adults who were between the age of 20 and 30 years old. There were more female (N = 162, 61.4%) than male (N = 88, 35.2%) participants in the original dataset. Participants were self-identified male and female; no third gender participants participated. 28 participants self-identified as non-heterosexual (gay, lesbian, bisexual, or other). Selection criteria for inclusion in the study were the minimum age of 18 years, the ability to comprehend the English language and willingness to self-reflect upon questions regarding online dating, mental well-being, body image and self-esteem.

Procedure

      Participants were required to provide informed consent to the terms and conditions of the study. After giving informed consent, the participants were redirected to the online questionnaire. The participant then had to answer questions regarding their age, gender, nationality, the frequency of their online dating app use, self-objectification, mental well-being, self-esteem and body satisfaction. Participants were afterwards thanked for their participation and were provided with the contact details of the researchers in case they wished to receive further information.

Validity of the dataset

      The ethical approval for the original study was provided by the Ethics Committee of the BMS (application number: 200344). The data was collected between the 31st of March and the 12th of April 2020. The data obtained through the sample is less than one year old. The use of online dating apps remains very popular with mobile dating app use increasing with 17% over a two year period (Sawyer et al., 2018). This indicates that online dating app use remains very prevalent among young adults. The data obtained by the first study can thus still be considered relevant. It is assumed that the frequency of the use of online dating apps among young adults did not decrease between the time of original data collection and now. The data thus seems sufficient reliable and valid for use in the current study.

Materials

      The online questionnaire that was used in the original study consists of questions about demographics, online dating behaviour, and validated scales measuring self-objectification, mental well-being, self-esteem and body satisfaction.

Demographics and online dating behaviour

Participants had to provide information about their gender and sexual orientation. For gender the participants were provided with the following four options: *Male; Female; Other, namely:* and *Prefer not to answer*. The participants who answered *Other, namely:* could disclose their gender via a text box. People who answered preferred not to answer were excluded from the analysis.

For sexual orientation the participants were provided with five response options (*Heterosexual; Gay/Lesbian; Bi-sexual; Other, namely:* and *Prefer, not to answer*). These five options were recoded into either: Heterosexual (containing: *Heterosexual)* and Sexual Minority (containing: *Gay/Lesbian; Bi-sexual; Other, namely:*). People who answered *Prefer, not to answer* were excluded from the study.

Participants also had to indicate if they used online dating apps currently, had used dating apps in the past or never used dating apps. Participants who never used dating apps were also excluded from the study. First, participants provided an answer on how often they used an online dating app on a seven-point scale (*never, once per month, 2-3 times per month, once per week, 2-3 times per week, 4-5 times per week, daily*). Daily users then indicated how often a day they used the dating app on a four-point scale (*2-3 times per day, 4-6 times per day, once an hour, 2 or more times per hour*).

Participants who answered *never* were excluded from the current study. This because these participants have never been exposed to online dating apps and therefore have never experienced a potential objectifying experience through the use of these apps. The goal of this study is to see if an increase in exposure to online dating apps associates with more complaints. For non-users this association is not measurable and therefore they are not included. In the current study, both measures of frequency were combined to derive an overall

indication of frequency of use of online dating apps ranging from *once per month* to *2 or more times per hour*.

Self-objectification

Self-objectification is manifested through body surveillance (Moradi & Huang, 2008). Body surveillance in particular is related to disordered eating attitudes and depressive symptoms, whereas self-objectification is not (Moradi & Huang, 2008). Therefore measures of body surveillance were used to determine participants' levels of self-objectification.

Self-objectification was measured through the eight items of the Body Surveillance subscale of the Objectified Body Consciousness Scale (OBCS)(McKinley & Hyde, 1996). Examples of the items are "I rarely think about how I look" and "I think more about how my body feels than how my body looks". The response options range on a seven point Likert-scale from "Strongly disagree" to "Strongly agree". Six items are recoded and the final score of the subscale is a mean score of the total on the 8 items ranging from 1 (least) to 7 (most body surveillance and self-objectification).

The OBCS is considered to be a widely used and well validated instrument in nonclinical samples of adult women and men with a two week test-retest reliability of alpha .79 (Dakanalis, Timko, Clerici, Riva & Carrà, 2017; McKinley & Hyde, 1996). The current research found a similar alpha (α = .784).

Mental well-being

Mental well-being was measured with the 14-item Mental Health Continuum – Short Form (MHC-SF). The MHC-SF contains three different subscales; emotional well-being (e.g. "during the past month how often did you feel interested in life"), psychological well-being (e.g "during the past month, how often did you feel you liked most parts of your personality")

and social well-being (e.g. "during the past month, how often did you feel that people are basically good"). Items are answered on a six point scale ranging from "Never" to "Every day". The total score and the subscale scores are calculated based on the mean score of the items ranging from 1 (least) to 6 (most well-being). The MHC-SF has high internal reliability with a Cronbach's alpha of .89 (Lamers, Westerhof, Bohlmeijer, ten Klooster & Keyes, 2011). In addition, a good convergent validity and discriminant validity was found (Lamers et al., 2011). In the current research a high Cronbach's alpha was found (α = .892).

Self-esteem

The ten-item Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965) was used to measure self-esteem. Examples of items included are "On the whole, I am satisfied with myself" and "At times, I think I am no good at all". Five items were positively formulated like in the first example and five items negatively formulated like in the second example. All negative items were recoded and reversed. The response options range on a four point Likert scale from "Strongly disagree" to "Strongly agree". The total score is the mean score of the ten items with scores ranging from 1 (lowest) to 4 (highest self-esteem). In a study of Gray-Little, Williams and Hancock (1997) alpha's ranging from .72 to .88 were found for the RSE. This is in line with a study of the Dutch RSE in which a high internal consistency was found with a Cronbach's alpha of .86 (Franck, de Readt, Barbez & Rosseel, 2008). In the current research a similar high alpha was found (α = .852).

Body satisfaction

To measure body satisfaction the nine item subscale Body Image Concerns of the Body Uneasiness Test (BUT; Cuzzolaro, Vetrone, Marano & Garfinkel, 2006) was used. This subscale is described to measure "Worries related to physical appearance" (Cuzzolaro et al.,

2006, p. 3). Cuzzaloro et al. (2006) state that "people with body image disturbances display not only dissatisfaction with particular parts, shapes or functions, but also an uneasiness, which is more general, less specific and often very difficult to describe" (p. 1). This shows that body uneasiness and body satisfaction are related concepts, but that body uneasiness seems to be a more broad and general concept. Body satisfaction is therefore measured by the level of body uneasiness as these concepts are related.

Examples of items of the Body Image Concerns subscale are "I like clothes which hide my body" and "I am dissatisfied with my appearance". The participants answered on a six point scale ranging from "never" to "always". The total score of all nine items is calculated. A higher score indicates greater body image concerns and less body satisfaction. The reliability of the subscale body image concerns was found to be high with a Cronbach's alpha of .90 (Cuzzolaro et al., 2006). In the current research a similar high alpha was found ($\alpha = .912$).

Description of the current dataset

Participants who never used online dating apps were excluded from the current study (N = 84). In addition, participants who had missing data on the items assessing online dating app usage were also excluded (N = 14). One participant was excluded on the basis of not disclosing his or her sexual orientation. The final dataset for the current analysis was 165. The required sample size was calculated through a priori power analysis with G*power 3.1 (Faul, Erdfelder, Buchner & Lang, 2009). This was done with a medium effect size ($f^2 = .15$), a power of .95 and one predictor variable. The total sample size calculated by G*Power 3.1 was 89. Therefore the sample of 165 respondents was considered large enough for the planned analyses (see Data Analysis).

The sample of 165 participants consisted of 22 respondents who self-identified as sexual minority (13.33%). Butler et al. (2016) found that among health surveys in the US

from the male respondents 3.7% identified as homosexual and 1.2% as bisexual. For the female respondents this was 1.4% as homosexual and 2.5% as bisexual. The percentage of respondents that self-identify as a sexual minority in the current study thus seems to be higher than found in the study of Butler and colleagues (2016). It can therefore be concluded that the sample of data contains a sufficient number of respondents that self-identify as a sexual minority and is representative for sexual minority people.

In the original study no data was collected about the ethnicity of the participants. Also, no data was collected about the educational level of the participants. In addition, no third gender participants were included. This study is therefore not able to take these variables into account in the analyses nor make statements about the representativeness of the findings for people from various ethnicities or educational backgrounds.

Furthermore, the vast majority of the participants in the sample were from Germany (70.3%). Therefore, the findings are not generalizable to other nationalities. No further actions were taken to obtain additional data and the secondary dataset was used in isolation. This choice was based on limitations in time as the current research phase did not allow for an extended period of data collection.

Data analysis

For statistical analysis of the formulated hypotheses the program IBM SPSS Statistics 25 was used. First, Pearson's correlations between the variables self-objectification, mental well-being, self-esteem and body satisfaction were calculated. Next, Spearman's Rho correlations were calculated to establish how frequency of dating app use regressed on self-objectification, mental well-being, self-esteem and body satisfaction to test the first hypothesis (H1). Pairwise deletion of cases was applied to exclude cases from analysis if they had missing values on specific outcome variables, but to include those cases in the analysis if they did not have

missing values on other outcome variables. Finally, moderation of gender and sexual orientation was assessed in four separate linear regressions (H2). To assess moderation, the PROCESS macro tool of Hayes (2013) was used. The frequency of dating app use was defined as the X variable, self-objectification, mental well-being, self-esteem and body satisfaction were defined as the Y variable, and gender and sexual orientation were the moderator variables (W). Interaction effects found by the PROCESS marco tool were displayed through interaction plots. For all analyses, the significance level was set at $p < .05$.

<center>**Results**</center>

Demographics

The majority of the respondents were female (N = 97, 58.8%) as shown in Table 1. No third gender persons participated in the survey. The mean age of the participants was 23.27 years (SD = 4.91) with a range between 18 and 55 years. The majority of the participants were from Germany (70.3%), with 9.7% being Dutch and 20% being from other countries. The frequency of dating app use among the participants is also shown in Table 1. Most of the respondents used dating apps 2-3 times a week (N = 44, 26.7%).

Table 1

Demographics of the participants and frequency of dating app use

Characteristics	N	%
Gender		
Male	68	41.2
Female	97	58.8
Sexual orientation		
Heterosexual	143	86.7
Sexual Minority	22	13.3
Frequency of dating app use		
Once per month	22	13.3
2-3 times per month	18	10.9
Once per week	25	15.5
2-3 times per week	44	26.7
4-5 times per week	17	10.3
2-3 times per day	22	13.3

4-6 times per day	11	6.7						
Once an hour	4	2.4						
2 or more times per hour	1	0.6						

Table 2

Number, Mean, standard deviation, Cronbach's α, Spearman's and Pearson's correlations

Variable	N	M	SD	α	1[1]	2	3	4
1.Frequency of use	164	3.93	1.90		—			
2.Self-objectification	138	4.29	.98	.784	.046	—		
3.Mental well-being	152	3.09	.83	.892	-.154	-.248*	—	
4.Self-esteem	152	2.95	.47	.852	.280	-.320**	.449**	—
5.Body satisfaction	139	24.21	9.09	.912	-.099	-.465**	.251*	.454**

[1]Spearman Correlation

*p $< .05$. **p $< .01$.

Table 2 shows the number of cases, the mean, standard deviations, Cronbach's alpha's Spearman's and Pearson's correlations. The Cronbach's $α$ from the different subscales are reliable ($α > .784$). All four different outcome variables significantly correlated to each other. Self-objectification has a significant negative correlation with mental well-being ($r = -.248$, $p = .003$), self-esteem ($r = -.32$, $p = .000$) and body satisfaction ($r = -.465$, $p = .000$). Mental well-being has a significant positive correlation with self-esteem ($r = .449$, $p = .000$) and body

satisfaction (r = .251, p = .003). Self-esteem has a significant positive correlation with body satisfaction (r = .454, p = .000).

Hypothesis 1

Spearman's Rho showed no significant correlations between the predictor variable frequency of dating app use and the outcome variables (all $p > .05$). In other words, frequency of dating app use was not associated with self-objectification, mental well-being, self-esteem or body satisfaction in the total group.

Hypothesis 2

An interaction effect between frequency of dating app use and gender was found between on the outcome variable self-esteem (p = .025) as shown in table 3. This indicates that there is a moderating effect of gender between the frequency of dating app use and self-esteem. In figure 1 the interaction plot of the relationship with the moderator variable is shown.

Table 3

Moderation analysis with the outcome variable self-esteem

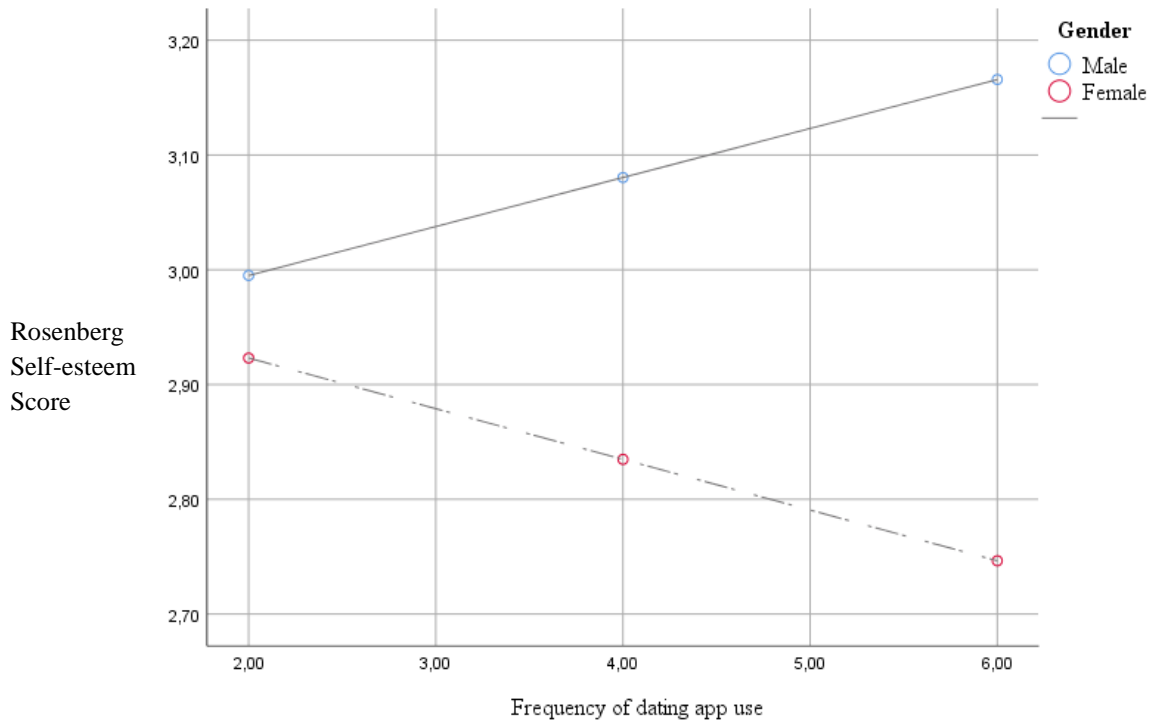| Characteristics	b	SE B	t	p
Frequency of use	.130	.061	2.131	.035*
	(.010, .250)			
Gender	.102	.168	.606	.546
	(-.231, .434)			
Frequency of use x Gender	-.087	.038	-2.271	.025*
	(-.163, -.011)			

*$p < .05$

Figure 1. Interaction plot (N = 155)

Furthermore, no significant interaction effects were found for gender between frequency of dating app use and self-objectification, mental well-being and body satisfaction.

For sexual orientation, moderation analysis showed no significant interaction effect between frequency of dating app use and self-objectification, mental well-being, self-esteem and body satisfaction.

Summary of the results

From the analyses, it can be concluded that the first hypothesis is rejected as no significant association was found between frequency of dating app use and the outcome variables. Support for the second hypothesis was only found by a significant interaction effect between frequency of dating app use and self-esteem with gender as moderator variable.

Discussion

The aim of this study was to examine if frequency of dating app use was associated with self-objectification, self-esteem, mental well-being, body satisfaction and whether this association was moderated by gender or sexual orientation. This was done as prior studies showed inconclusive results about how frequency of dating app use was associated with these variables (e.g. Breslow et al., 2020; Anderson et al., 2018) and it was unclear if these associations were moderated by gender or sexual orientation (e.g. Breslow et al., 2020; Kozak et al., 2009; Moradi & Huang, 2008).

The findings of this study suggest that frequency of online dating app use is not associated with well-being and objectification in young adults. This is in line with the results of Breslow et al. (2020) who also found no significant relationship between the frequency of dating app use and self-esteem or online objectification. However, these results are not in line with previous research, which suggest that more frequent or constant use of social network technology aggravate effects on well-being (Holland & Tiggermann, 2016).

In the current study no association was found between frequency of dating app use and well-being and objectification. However, the study from Strubel & Petrie (2017) found significant differences between Tinder users and non-users in regards to self-esteem and body satisfaction in a sample of young adults (18-34 years). This indicates that the use of dating apps, though not frequency of use, potentially aggravate effects on well-being among young adults. Furthermore, it could also be that not frequency of use, but involvement is negatively associated with well-being. Manago et al. (2015) found that involvement in Facebook was associated with objectified body consciousness, which in turn predicted body shame. Involvement was defined as the combination of investment and time spent (actively and

passively) on the Facebook. This is in line with other findings that indicate that investment in SNSs is associated with lower self-esteem (Blomfield Neira & Barber, 2014). It could thus be that involvement, investment and time spent on online dating apps are associated with well-being and not the frequency of use. The results of the current study indicate that the framework of the objectification theory does not provide a sufficient explanation for the relationship between frequent online dating app use, objectification and well-being.

Though the current study did not find any association between frequency of use and well-being, results from another study suggest an association (Holland & Tiggermann, 2016). A theory that could potentially explain the relationship between frequency of online dating use, objectification and well-being is the sociocultural theory (Thompson, Heinberg, Altabe & Tantleff-Dunn, 1999; Tiggemann, 2011). According to this theory, women aspire to unrealistic beauty ideals presented by the media, resulting in body dissatisfaction if these ideals are not achieved. Furthermore, the theory proposes that internalisation and appearance comparisons are the mechanisms underlying this process causing women to internalise and make appearance comparisons to these unrealistic beauty ideals portrayed by the media (Thompson et al, 1999; Tiggemann, 2011). Internalisation and appearance comparisons could thus possibly be underlying components which could be affected by more frequent online dating app use or mediate the relationship between online dating app use and body dissatisfaction. For future research, it is advised to look into the association between frequency of dating app use and the constructs internalisation and appearance comparisons. By doing that one would gain insight into the applicability of the sociocultural theory for the relationship between frequency of use and objectification and well-being.

Another possible explanation for the result that no association was found between online dating app use and the outcome variables can be provided by the findings of Breslow et al. (2020). The authors found that the number of dating apps was significantly related to self-

esteem and online objectification. They suggest that the number of apps used could play an important role in the process of objectification and that some apps could potentially allow for more objectifying experiences to occur that others. Moreover, the motivation to use a dating app could also influence the level of objectification. It was found that greater frequency of using Grindr with the motivation to find sex partners was associated with more self-objectification and objectification of others (Anderson et al. 2018). In addition, in a study it was found that 75% of the sexual minority men had reportedly had a sexual encounter with a partner they met through Grindr (Rice et al., 2012). The use of Grindr thus could potentially be more objectifying than the use of other online dating apps. This also could provide a potential explanation for why the current study did not found any associations between frequency of online dating app use and objectification as this study included mainly Tinder users (N = 135) and only a few Grindr users (N = 4). It could thus be that there is a cumulative effect of the number of dating apps, choice of dating app, and motivation for dating app use which increase the overall level of objectification and psychological distress that user's experience. For future research, it would thus be desirable to assess these variables and assess how they associate to self-objectification, body satisfaction, mental well-being and self-esteem and if these different variables are confounded by each other.

In regards to moderation of gender, only an interaction effect was found between the association of frequency of dating app use and self-esteem. It was found that the association was stronger for women then for men. These results are consistent with the objectification theory (Fredrickson & Roberts, 1997) as the theory suggests that by increased exposure to the objectifying experiences of dating app use, especially women would be subjected to more self-objectification and body shame which in turn influences self-esteem.

Another possible explanation can be found in the sociometer theory developed by Leary (2005). This theory proposes that self-esteem is a gauge of the degree to which an individual perceives to be valued and accepted by others. According to the theory, self-esteem is therefore the outcome of the perceived level of social and relational acceptance or rejection that an individual feels (Leary, 2005). While using dating apps, social and relational rejection occurs for users by not being 'liked' by other users. A study found that heterosexual rejection from the opposite sex caused a significant decline in self-esteem compared to rejection from friends (Pass, Lindenberg, Park, McClintock & Liebrand, 2010). Furthermore, it was found that for women self-esteem decreased only after they received rejection based on their physical attractiveness whereas for men self-esteem decreased only after they received rejection based on their competence or status (Pass et al., 2010). As dating apps like Tinder have profiles that primarily consist of photo's, this provides a possible explanation for the effect found in this study as more online dating app use for women potentially leads to appearance based rejections which in turn decreases self-esteem. For future research, it would be recommended to further explore which theory and model best explains the relationship between online dating app use and self-esteem for women. This could be done by investigating whether the relationship between frequency of use and self-esteem is mediated by body surveillance and self-objectification as explained by the objectification theory or whether (appearance based) rejection mediates the relationship according to the sociometer theory.

No moderating effects for gender were found for mental well-being, self-objectification and body satisfaction. The objectification theory suggests that women would be more affected compared to men by dating app use and the theory thus seems not to apply in the current sample. The sociocultural theory, which was mentioned earlier in the discussion, could also provide an alternative explanation for the absence of the moderating

effect (Thompson et al, 1999; Tiggemann, 2011). According to the sociocultural theory, this effect could potentially be mediated by internalisation and appearance comparisons which could ultimately lead to body dissatisfaction (Thompson et al, 1999; Tiggemann, 2011). Future research thus has to be done on these associations between these different variables to provide more insight.

For sexual orientation, also no moderating effect was found. An explanation could be provided by a limitation that was caused by the design of this study. In the current study the decision was made to include sexual minority people in one group and not separate sexual orientations (e.g. lesbian, gay, bisexual etc.). This was done as there was a limited number of participants that self-identified as sexual minority and dividing them into separate categories would further reduce statistical power to make inference about the sexual minorities. However, previous research suggests that self-objectification may operate differently for people of different sexual orientations. For gay men it was found that they are more likely to self-objectify themselves compared to heterosexual men (Kozak et al., 2009; Martins et al., 2007). For lesbian woman, contradicting results were found regarding self-objectification and body surveillance; one study found that lesbian had greater levels of body surveillance than heterosexual woman (Kozee & Tylka, 2006) whereas another study found that lesbian woman reported similar levels of self-objectification but significantly less body surveillance compared to heterosexual women (Hill & Fischer, 2008). In one study among female exotic dancers it was found that bisexual dancers had similar levels of body surveillance compared with heterosexual dancers (Downs, James & Cowan, 2006). In addition, Wiseman and Moradi (2008) found that the objectification theory framework was also applicable for bisexual men with associations between sexual objectifying experiences, self-objectification, body shame and eating disorder symptoms. Objectification thus seems to differ among different sexual orientations and genders, which the current study was not able to assess correctly. For future

research, it would thus be advisable to assess the different sexual orientations per subgroup and per gender of those subgroups to be better able to make inferences about the association between objectification and the use of online dating apps for sexual minority people. From the current body of literature, it can be expected that for gay and bisexual men there is a stronger association between the use of online dating apps and objectification compared to heterosexual men (Breslow et al., 2020). For lesbian and bisexual women the results of the current research are inconclusive and thus need to be further examined (e.g Hill & Fischer, 2008; Kozee & Tylka, 2006). Lastly, to the author's knowledge there has been no research into the effects of online dating apps on other sexual minorities (e.g. transsexual, intersexual, pansexual, asexual etc.) which should also be explored in further research.

Limitations and strengths

The design of the study had some limitations. The first factor that posed a limitation was the inclusion of participants who used dating apps in the past. Participants had three response options on the question if they used dating apps: *Yes, I use it currently; Yes, I used it in the past; No, I never used it*. Participants who never used dating apps were excluded, but participants who used dating apps in the past were included as they had been exposed to dating app use. It is however unclear how long ago the participants had used dating apps and how long ago the frequent exposure to dating apps had taken place.

To date, no studies have examined the effects between online objectification and dating app use over time. Only a few longitudinal studies have been done on the topic of objectification. Aubrey (2006) found in a two year long study among college students, that exposure to sexually objectifying television during the first year led to an increase in trait self-objectification than during the second year for both genders. This result is in line with the findings of Vandenbosch and Eggermont (2015) who, in their longitudinal study, found that

for adolescent's, exposure to sexualizing mass media (music entertainment television and magazines) was associated with self-objectification and that this association was mediated through the internalisation of the appearance ideals promoted by sexualizing mass media. The authors also found that the use of social networking sites to monitor attractive peers as well as the use of sexualizing mass media was found to be associated with an increase in body surveillance and self-objectification over time. Another study found differences between genders and the sort of media that participants were exposed to. Doornwaard et al. (2014) found, in a longitudinal study among adolescents, that the use of sexually explicit internet materials predicted body surveillance only for male adolescents while the use of social networking predicted body surveillance only for female adolescents. These results suggest that the effect of exposure to objectifying experiences withholds over time and can lead to body surveillance and self-objectification over time. Furthermore, the types of sexual objectifying media might lead to different effects between genders. However, as only one study reported gender differences these results are inconclusive and more research is needed.

Whether these effects are similar for the association between online dating apps, self-objectification and body surveillance is unclear. In one study it was found that respondents who currently used Grindr objectified other men more than respondents who hadn't used Grindr recently but had used the app in the past (Anderson et al., 2018). Participants who never used Grindr were not found by the researchers as the app is very popular among sexual minority men. These results indicate that current use and thus exposure to online dating apps increases objectification, but these results are limited by the fact that it was unclear how long ago the participants had used the app. Future research should therefore examine the effects of objectification through online dating app use over time in a longitudinal research design in order to make better inferences about the effects over time.

The present study also provides several strengths. Firstly, in this study all different outcome variables are significantly correlated with each other. This study found that more self-objectification is associated with less body satisfaction, less mental well-being and less self-esteem. These results indicate that the model of the objectification theory itself provides a good fit for the process of self-objectification through body surveillance which leads to more body shame and psychological complaints (Moradi & Huang, 2008).

Secondly, the internal consistency of the different outcome scales ranges between good ($\alpha = .784$) and very good ($\alpha = .912$). This indicates that the participants reliably answered the questions on the different constructs which increases the overall reliability of the results.

Lastly, the sample of the study provides a strength. Participants in the original study were recruited via a convenience sample and included many young, highly educated, German students. Online dating apps are primarily being used by young adults with about one third of the 18 to 24 year olds reportedly having used online dating apps (Sumter & Vandenbosch, 2019). The young age of the participants is a strength in the current study design as the participants were in the same age category as online dating app users typically are. This is a benefit in regards to generalizability of the results.

Regarding the higher educational level of the participants in this study, it is unclear how this may have affected the results. In other studies also mainly highly educated individuals participated (Breslow et al., 2020; Sumter & Vandenbosch, 2019; Ward, 2017). It was also found that higher educated online daters (Whyte & Torgler, 2017) and Tinder users (Ward, 2017) are more likely to contact and search for potential partners who are similar to them and have similar educational levels. This could potentially influence online dating app experiences of people of lower educational level as they are being exposed to rejection based on their educational level if they tried to match to higher educated people. More research

would be needed to investigate how educational level affects the use of online dating apps and the experiences that people of different educational levels have with online dating app use.

In addition, the vast majority of participants in the study were German. It is unclear how this affects the results of this study as no study, to date, has been done concerning possible differences in online dating app users between countries or regions. More research would have to be done to establish whether there are differences in online dating app use and effects among users of different countries and regions.

Future research

For future research, the relationship between personality traits and online dating app use and objectification could also be examined. In a study of Bonilla-Zorita et al. (2020), it was found that personality traits such as neuroticism, sociability, sensation-seeking and sexual permissiveness relate to greater online dating use. Next to an increase in use, personality traits could also influence the experience and effect that only dating app use has on its users. In a study of Orosz et al., (2018), a weak relationship was found between the big five personality traits and problematic tinder use[1]. It remains however unclear how personality potentially moderates the effect of frequent dating app use on self-objectification and body image. For future research it is suggested to look into the effects of personality traits on the use of online dating apps and the experiences of the users.

Conclusion

The results of this research show that more frequent dating app use is not related to an increase in self-objectification or a decrease in mental well-being, self-esteem and body satisfaction. The results nuance that an increase of the frequent use of dating apps does not

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[1] Problematic tinder use is defined based on the components salience, mood modification, tolerance, withdrawal, conflict and relapse (Orosz, Tóth-Király, Bőthe & Melher, 2016).

predict detrimental effects on its users who are often young adults. Also little evidence was found for a moderating relationship between frequency of use and the different outcome variables as only an effect was found between frequency of use and self-esteem with gender as moderator. The results also suggest that the framework of the objectification theory does not explain the relationship between frequency of online dating app use and objectification, body satisfaction, mental well-being and self-esteem.

With 10 million active daily users (March et al., 2017) of Tinder alone, it is important to understand the effects that these online dating apps have on its frequent users. Though this study suggests that the effects do not seem to be detrimental for frequent users over all users, other studies did find that the use of online dating apps can have detrimental effects on its users (e.g. Breslow et al., 2020; Strubel & Petrie, 2017). As frequency of use does not seem to explain for the detrimental effects it is thus important to investigate what other factors of online dating apps use contribute to the detrimental effects found in other studies. In addition, it is important to investigate if users of different gender or sexual orientation are more at risk by these other factors. This is important as the use of online dating apps is widespread and common among people of different gender and sexual orientation.

Recommendations for future research are: research into the sociocultural theory and if this theory explains the relationship between frequency of dating app use and objectification and psychological well-being; Research into the relationship between frequency of use of dating apps and self-esteem to see if this relationship is mediated by self-objectification/body surveillance or trough (appearance based) rejection; the conduction of a longitudinal panel study with multiple waves to assess the effects of online dating app use (including variables like frequency of use, time spent on app, number of apps, which apps used etc.) on different outcome variables over time with a large group of respondents of different age, gender,

educational level and sexual orientation to be able to make inference about the effects over

time for these groups.

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