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Social media and mental health

Does gender moderate the relationship between type of use on Instagram and self-esteem?

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Abstract

Background. The recent growing social media platform Instagram seems to be very attractive for the age group of 18 to 29 year olds. Research revealed that social media use can have positive as well as negative consequences on the mental health of the user and Instagram is rated as the application with the most negative impact. Self-esteem is highly associated with and influenced by social media use. Currently, research on gender differences on this topic is limited. The aim of this study is to explore if gender acts as a moderator between Self-directed use (SDU) on Instagram and self-esteem, and between Other-directed use (ODU) on Instagram and self-esteem.

Methods. A cross-sectional online survey-based research design was conducted with 241 participants with 81% females and 19% males, aged from 18 to 39 (M=2; SD=2,34). The research survey consisted of in total 27 questions covering demographical questions and the three variables self-esteem, SDU and ODU. For statistical analysis the computer program IBM SPSS Statistics was used.

Results. In this study, participants with high SDU scores showed significant lower self-esteem than participants with lower SDU scores but no significant correlation was found between ODU and self-esteem. Women in this sample make significantly more self-directed use than men, whereas men make significantly more other-directed use than women. On general self-esteem, women showed significantly higher self-esteem levels than men. Overall, no significant moderation effect of gender has been found between SDU and self-esteem neither between ODU and self-esteem.

Conclusion. These findings support the literature stating that women and men differ in how they use social media. The present study contributes to the literature on the relationship between social media use and self-esteem by emphasizing that self-esteem should rather be treated as a two-sided construct, stable as well as fluid to embrace the whole concept of self-esteem. Furthermore, self-esteem and social media use seem to be interrelated with each other and elaborated models with correlations in both directions are recommended to fully determine how self-esteem and social media use are related to each other. Finally, more data about the rapid growing social media platform Instagram and how to measure it can form a starting point for future research.

      Keywords. *Self-esteem, Social media use, Instagram, Gender*

Introduction

This year internet users worldwide have passed the 4 billion mark, which means that more than the half of the total world population is making use of the internet (WeAreSocial, 2018). This can also be applied to Europe, where more than the half of the European population is using the internet (WeAreSocial, 2018). What are people doing online? Next to online banking, shopping, gaming, listening music, watching videos and gathering information the *Global Digital Report 2018* from WeAreSocial (2018) has shown that around 3.2 billion people make use of social media networks. Furthermore, 80-90% of all 18 to 34 year olds are making use of social media and therefore, this age group can be ascribed as the biggest user group on social media platforms (WeAreSocial, 2018; Royal Society for Public Health [RSPH], 2017). Social media consists of weblogs, online communities, social networking sites, collaborative projects, virtual game worlds and virtual social worlds where users can produce, share and work together on online content (Kuss & Griffiths, 2017). In most of these platforms users have their own created public profiles and primarily interact with real-life friends to maintain these relationships (Kuss & Griffiths, 2017; Donnely & Kuss, 2016). Additionally, the fact that the internet has no time and space limitations makes connections with other people such as celebrities or foreign people with same interests very easy (Kuss & Griffiths, 2017). Thus seems social engagement to be one of the major reasons why people make use of social media. But depending on the personality, social media use can have different benefits for different users such as to enhance the social network, compensate for an offline social network, promote yourself, manage feelings, behaviour or self-presentation and to express your personality, feelings or opinions (Buffardi & Campbell, 2008; Kuss, 2017; Mehdizadeh, 2010). Hence, it gets visible that social media use is strongly related to the self, the personality and the social environment of the user.

Impact of social media on mental health

Therefore, social media use can have an impact on the well-being and mental health of the user. This impact can be positive as well as negative. Positive influences on the mental health of a user are for example an enhanced social support (Banjanin, Banjanin, Dimitrijevic & Pantic, 2015), social capital, social interaction (Andreassen et al., 2016) or establishing and maintaining relationships (Donnely & Kuss, 2016). The negative sides of social media use can be feelings of loneliness, low self-esteem, depression (Banjanin et al. 2015), a negative self-evaluation (Lyubomirsky & Ross, 1997; Jackson & Luchner, 2017), envy (Tandoc, Ferrucci & Duffy, 2015), dissatisfaction with life (Emmons & Diener, 1985), hostility (Testa & Major,

1990), frustration (Aspinwall & Taylor, 1993), jealousy (Salovey & Rodin, 1984), discouragement (Wheeler & Miyake, 1992) and addiction (Kuss, 2017; Banjanin et al., 2015; Andreassen et al. 2016; Błachnio, Przepiorka & Pantic, 2015; Donnely & Kuss, 2016).

One social media platform that is rated as the most negative one compared to other social media platforms such as Facebook, Snapchat and YouTube, is Instagram (RSPH, 2017). This means that this photo-sharing website/application has the most negative impact on mental health and well-being of the user (RSPH, 2017). Speaking about Instagram in numbers, research revealed that Instagram has around 800 million users worldwide which are 32% of all internet users (Omnicore, 2018). Of all internet users, 59% between the ages of 18 and 29 is using Instagram and women are with 68% the leading gender (Omnicore, 2018). The fact that much of previous research tended to focus only on the social media platform Facebook and significant results are to be expected because of the highly negative impact on mental health and well-being compared to other social media platforms, led to the decision to concentrate this research on Instagram.

Self-esteem and social media use
One personality concept that seems to be highly associated with social media use, is self-esteem. Self-esteem can be defined as a person's positive or negative self-evaluation which consists of the person's view on his or her worth and competence (Coopersmith, as cited in Vogel, Rose, Roberts & Eckles, 2014; Weiten, 2004). One general fact about self-esteem is, that everyone has a vital need to maintain or raise it (Schlenker, 1985; Steele, 1988). Furthermore, self-esteem can have different social and existential functions, such as being accepted in a group or having meaning in life (Leary, Tambor, Terdal & Downs, 1995). It can be described as a two-sided construct, because it is on the one side a "mostly stable trait that develops over time" and on the other side "a fluid state that is responsive to daily events and contexts" (Heatherton & Polivy, as cited in Vogel, Rose, Roberts & Eckles, 2014, p. 207).

As social media platforms serve for self-presentation and social comparison with others, it can be anticipated that social media use and self-esteem are related to each other. This confirms also the wide repertoire of research on this relationship. The results of past research revealed for example that the type of online feedback (Valkenburg, Peter & Schouten, 2009), the amount of time spent online (Vogel et al. 2014) or the type of use (Gonzales & Hancock, 2011; Donnely & Kuss, 2016; Vogel et al. 2014) can be associated with a decrease or increase of the user's self-esteem. Thus, social media use can influence how people evaluate themselves. But a relationship the other way around can also be

associated. This means, that a person's self-esteem (high or low) can influence how this person is making use of social media. For example research has shown an association between low self-esteem and addictive social media use (Andreassen et al. 2016; Krämer & Winter, 2008).

Self-directed & Other-directed Use

To maintain or raise their own self-esteem, people strive for a positive self-presentation within online settings (Mehdizadeh, 2010). Social media allows people to carefully create and present an optimal version of themselves via profiles, pictures and posts. This can improve the self-esteem by for instance: Enhancing the awareness of the optimal self (Gonzales & Hancock, 2011), providing "an outlet for the hoped-for possible self to be expressed" (Krämer & Winter, as cited in Mehdizadeh, 2010, p. 358), offering a safer place to express yourself (Forest & Wood, 2012), or inspiring people to come closer to their desired self (Lockwood & Kunda, 1997). Furthermore, research revealed that even viewing or editing your own profile enhances the self-esteem (Gonzales & Hancock, 2011). In this study, the type of use that contains being concerned with one's own profile such as viewing and editing the own profile is referred to as Self-Directed Use (SDU).

However, more often the opposite effect can be found, a decrease in self-esteem. The social media users present themselves in the most positive way but they are also virtually connected to many other people trying to do the same. Therefore they are constantly exposed to positive characteristics, experiences, successes, material goods, happy relationships and so on, that other people share over their life (Tandoc et al. 2015; Gonzales & Hancock, 2011). Automatically people compare themselves with these people. When they view these others as superior to themselves, this is called upward-comparison and can lead to feeling subordinated and/or inadequate, experiencing negative affect, having a poorer self-evaluation and diminishes feelings of one's own self-worth (Tandoc et al., 2015; Gonzales & Hancock, 2011; Vogel et al., 2014). This upward-comparison can be even worse when users are connected to people they do not know personally, such as celebrities and public figures who live high standard and luxurious lives (Donnely & Kuss, 2016; Vogel et al., 2014). All in all, a problematic upward comparison with the idealized online selves of others can lead to the impression that other people live a happier life and the self is seen as incompetent and unworthy. This type of use that contains being concerned with other people's shared online content, such as looking at other people's pictures is referred to as Other-Directed Use (ODU).

Gender

As use of social media is different between men and women so are the influences on the relationship between social media usage and self-esteem. Research states that gender can predict differences in self-esteem (Joseph, Markus and Tafarodi, as cited in Gonzales & Hancock, 2011) and that men tend to repot higher self-esteem than women (Kling, Hyde, Showers & Buswell, 1999; Maccoby & Jacklin, 1974; Bachman et al., 2011). Furthermore, women tend to "spend 10% more time on SNS [Social Networking Sites] than men, and are also more active in composing profiles" (comScore, as cited in Haferkamp, Eimler, Papadakis & Kruck, 2012, p.92). Additionally, creating a positive self-presentation seems to be more important for women than for men (Tufekci, 2008). However, in the literature only two articles seem to explicitly focus on the relationship between social media use, self-esteem and gender. The research of Haferkamp et al. (2012) showed that social-comparison and searching for information on social media is more likely for women and searching for friends on social media is more likely for men. For self-presentation, females prefer using group names and adding portrait photos to their profiles, whereas males prefer full-body shots (Haferkamp et al., 2012). Research by Barker (2009) revealed that men were more likely to seek social compensation and social identification when using social media. For women a high positive collective self-esteem, greater overall use and communication with peers as a motive for social media use were found (Barker, 2009).

Because social media use can have detrimental effects on self-esteem and thus mental health, and gender seems to be a factor that can moderate this relationship, gender should be an important aspect in research. However, most of research concerning social media use and self-esteem is more general, meaning gender is not taken into account as a predictor of differences between the relationship of social media use and self-esteem. Therefore, research on this topic seems limited and further research could provide more insights "regarding the analysis of the gender gap 2.0 and its implications for communication and self-presentation on the social web" (Haferkamp et al., 2012, p.97).

Current research

The current research aims to examine differences in the relationship of type of use on Instagram and self-esteem between men and women. By exploring the rarely researched influence of gender in this area, this study attempts to give deeper insights on how gender can moderate the relationship between social media use and self-esteem, investigate the social consequences of social media, help profiling a group at risk, add to awareness of the negative

impacts social media can have on the users self-esteem and give incentives for further research to develop methods to reduce these negative consequences. Following the literature and the information given in the introduction, the subsequent general overall research question has been formulated:

Does gender moderate the relationship between type of use on Instagram and self-esteem?

To answer the research question, hypotheses have been formulated based on findings which lead to the assumptions that (1) the association between social media use and self-esteem may be stronger for women than for men (Tufekci, 2008; Haferkamp et al., 2012), and that (2) the type of use (SDU and ODU) can be associated with a decrease or increase in self-esteem (Tandoc et al., 2015; Gonzales & Hancock, 2011; Vogel et al., 2014; Donnely & Kuss, 2016). As a result, two conceptual models and two strings of research hypotheses have been established each for SDU and ODU.

> *H1: SDU correlates positively with self-esteem.*
> *H2: SDU correlates positively with gender.*
> *H3: Gender correlates negatively with self-esteem.*
> *H4: Gender moderates the relationship between SDU and self-esteem.*
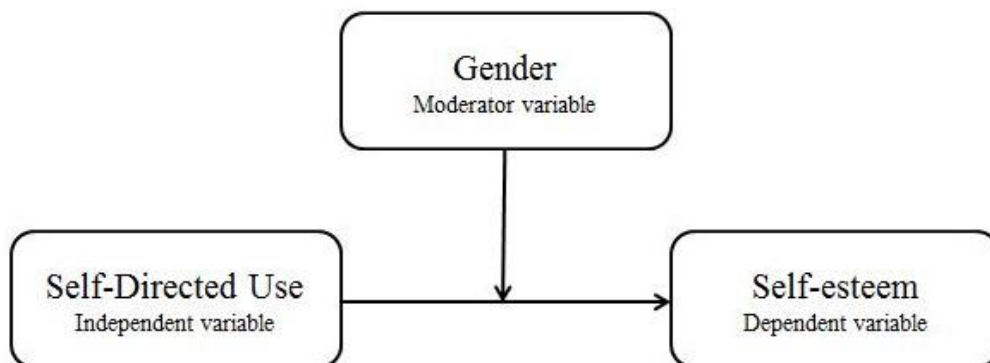
Figure 1. Conceptual model of the expected moderation effect. The relationship of SDU and Self-esteem is thought to be moderated by Gender.

> *H5: ODU correlates negatively with self-esteem.*
> *H6: ODU correlates negatively with gender.*
> *(H3: Gender correlates negatively with self-esteem.)*
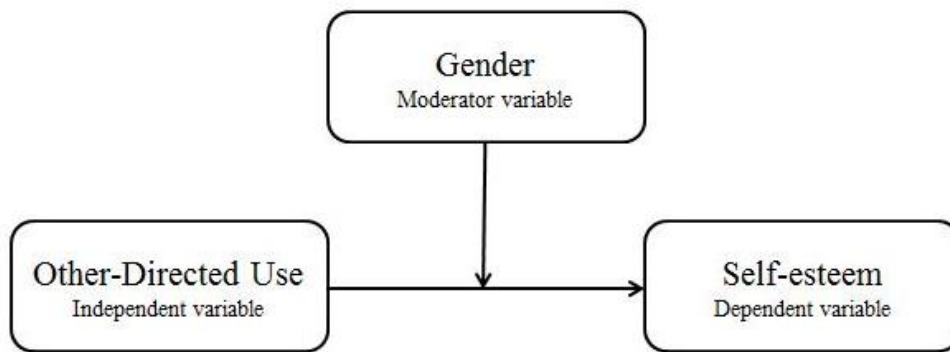> *H7: Gender moderates the relationship between ODU and self-esteem.*

Figure 2. Conceptual model of the expected moderation effect. The relationship of ODU and Self-esteem is thought to be moderated by Gender.

Methods

Design

To examine if gender moderates the relationship between Instagram use and self-esteem, a quantitative cross-sectional online survey-based research design was applied. In this study, the dependent variable is *self-esteem*, the independent variables are *SDU* and *ODU* and the moderator variable is *gender*.

A cross-sectional research design is beneficial because it is cheap, requires little resources and substantial data can be acquired in a short amount of time (Mann, 2003). Furthermore it is an appropriate design to determine the prevalence of the concerned outcomes (Mann, 2003).

Participants

The recruitment was implemented by convenience sampling to gather information from participants who are easily available (Etikan, Musa & Alkassim, 2016). Furthermore, this sampling method was used because it is cheap and easy (Etikan, Musa & Alkassim, 2016). The sampling has taken place via the social media platforms Facebook and Instagram and via Sona-systems, a psychology test subject pool for bachelor students provided by the University of Twente. Participants that responded via social media received no reward whereas students that participated via Sona-systems could earn credits. The participation was on a volunteering basis but selection was based on characteristics tailored on the studies interests, those formed the following inclusion criteria: (1) At least 18 years old, (2) sufficient English reading skills and (3) using Instagram. The exclusion criteria were (1) younger than 18 years old, (2) insufficient English reading skills and (3) not using Instagram.

Table 1 represents the general demographical characteristics of the participants. In total, 241 adults between the age 18 to 39 (M=21.04; SD=2.34) participated in this research. The sample consisted of 80,9% women and 19,1% men.

Table 1

General Demographical Characteristics of the Participants (N=241)

Item	Category	Frequency	%
Gender	Female	195	80,9
	Male	46	19,1
Age (years)	18	15	6,2
	19	40	16,6
	20	66	27,4
	21	37	15,4
	22	33	13,7
	23	26	10,8
	24	10	4,1
	25 to 39	14	5,7
Nationality	Dutch	31	12,9
	German	191	79,3
	Other	19	7,9
Employment	Student	215	89,2
Status	Full-time	24	10
	Part-time	2	0,8

Measuring instruments

To address the research question and measure the variables encountered in the formulated hypotheses, demographical questions were asked and three different scales were used (self-esteem, SDU and ODU). All information, questions and scales relevant for the participants to read were put together in one survey. This survey was created with Qualtrics®, an online survey tool.

Demographic data

The demographical characteristics age, gender, employment status and nationality were assembled through four questions at the beginning of the survey.

Rosenberg Self-esteem Scale

To assess self-esteem, the Rosenberg Self-Esteem Scale (RSES) developed by Rosenberg (1965) was used. This scale consists of 10 items which are rated on a 4-point Likert scale that ranges from "Strongly agree" (0) to "Strongly disagree" (3). Participants had to indicate how strongly they agree or disagree with each statement. The statements concern positive as well as negative feelings about the self. Examples of items are: "At times I think I am no good at all." and "I feel that I have a number of good qualities.". Higher scores on the scale indicate higher levels of self-esteem, therefore decoding of the 5 negative statements 2, 5, 6, 8 and 9 is necessary. The reliability of the RSES in older adolescents and young adults was rated as good ($\alpha = .86$; Tinakon & Nahathai, 2012). In general, the RSES shows high reliability ratings with an internal consistency of .77 (Rosenberg, 1965) and Cronbach's alpha coefficients between 0.72 to 0.87 (Statistics Solutions, n.d.). With the sample in this research the RSES showed a high reliability coefficient of 0.86.

Self-Directed Use Scale

To measure the SDU on Instagram, the Self-directed Use Scale was specifically for this research developed. This scale is based on all actions that a user on Instagram could perform and which can be ascribed as self-directed (e.g. "I post a picture" or "I edit my profile"). The scale consists of 5 items that can be answered by a 4-point frequency scale ranging from "Never" (0) to "Almost always" (3). High scores on this scale indicate a high incidence of SDU. The scale can be found in appendix A. The scale showed a good reliability of $\alpha = .72$.

Other-Directed Use Scale

ODU on Instagram was also measured by a specific scale developed for this research, the Other-Directed Use Scale. This scale is based on all possibilities to perform other-directed use. The scale consists of 3 items that can be rated on a 4-point frequency scale ranging from "Never" (0) to "Almost always" (3) . Examples of items are "I scroll through the newsfeed" or "I watch the stories of other people". High scores on this scale indicate a high incidence of ODU. The scale can be found in appendix B. The scale showed a poor reliability of $\alpha = .56$.

Procedure

After approval of the research by the Ethical Committee of the University of Twente, data was gathered between the 5th of April 2018 and the 1st of May 2018. Together with a short recruitment text about the goal of the study, the link to the Qualtrics® survey was distributed

via Facebook and Instagram and activated on the Sona-systems website. When clicking on the link, participants were shown general information about the study such as the goal of the study, estimated duration of filling in the survey (10 to 30 mins.), anonymity, confidentiality, withdrawal at any time and, in case of questions or remarks, an e-mail address of the researcher (Appendix C). Afterwards, the informed consent form was displayed, participants could accept if they agreed with the given information and if they wanted to proceed with the survey (Appendix C).

Within the first part of the questionnaire, participants had to answer the demographical questions. The second part consisted of the scales measuring the proposed variables concerning Instagram use and self-esteem. At the end of the survey, participants were informed that they successfully finished the survey, the answers have been recorded, they were thanked for taking part in the study and again contact data of the researcher was shown in case of additional questions or remarks.

Statistical analysis

To analyse the data the computer program IBM SPSS Statistics version 24.0 was used. Before starting the analysis, Skewness and Kurtosis were computed to confirm a normal distribution of the data.

Descriptive analysis

First step was the descriptive analysis of the data. Therefore mean- and sum-scores and standard deviations have been computed to analyse the independent, dependent and moderator variables. To confirm a normal distribution of the data, Skewness and Kurtosis were calculated with +1 and -1 set as cut-off scores. Moreover, Cronbach's Alpha coefficients were examined for all variables. Alpha values of $\alpha > 0.70$ were assumed to be acceptable (Tavakol & Dennick, 2011). For the demographic variables nationality, gender and employment status, frequencies and percentages have been calculated.

Reliability analysis

To test the reliability of the two for this research designed scales (Appendix A and B) a reliability analysis was conducted. When Cronbach's alpha is higher than .70 the scales can be confirmed as reliable (George & Mallary, 2003).

Correlational analysis

Before the actual moderation effects could be analysed all separate correlations between the variables were measured. Therefore, Pearson's correlation coefficients were conducted to assess correlations between SDU and self-esteem (H1), SDU and gender (H2), Gender and self-esteem (H3), ODU and self-esteem (H5), and ODU and gender (H6). Effect sizes between 0.1 and 0.3 are small, between 0.3 and 0.5 moderate and large when $r > 0.5$ (Cohen, 1988). Significant correlations are found when $p < .05$ (Cohen, 1988).

Moderation analysis

The last step was the analysis of the moderation effects. Therefore multiple regression analysis was used. This analysis was undergone two times, once for SDU and once for ODU.

For the first multiple regression analysis, a regression model predicting the outcome variable *self-esteem* from the predictor variable *SDU* as well as the moderator variable *gender* was fitted. The model in general (R^2) and both effects should be significant ($p < .05$). Second, the interaction effect of *SDU* and *gender* together was added to the first model. The change in (R^2) and the effect by the interaction term *SDU* and *gender* (H4) were checked on significance ($p < .05$).

For the second multiple regression analysis, a regression model predicting the outcome variable *self-esteem* from the predictor variable *ODU* and the moderator variable *gender* was fitted. The model in general (R^2) and both effects should be significant ($p < .05$). Second, the interaction effect of *ODU* and *gender* together was added to the first model. The change in (R^2) and the effect by the interaction term *ODU* and *gender* (H7) were checked on significance ($p < .05$).

Results

Within this section, the results of the scales are presented. This section is structured as following: (1) General descriptive statistics and reliability of the scales; (2) Correlational analysis; (3) Moderation analysis.

Descriptive statistics and reliability of the scales

Before the first analysis was run in SPSS, data was screened and reduced to the final data set (N=241). Participants who were under 18 years old, who did not fully complete the survey and/or who answered that they do not use Instagram were excluded. To analyse the reliability of the scales, Cronbach's alpha was computed. To analyse the distribution of the data,

Skewness and Kurtosis were used (Table 2). For the sample of this research, the RSES showed a high internal consistency (α = .87) and can therefore be assigned of good reliability. The SDU-Scale displayed a good reliability with α > .70, whereas the ODU-Scale showed poor reliability with α > .50. Analysis of Skewness and Kurtosis showed that the data of all scales is normally distributed (+1 > skewness/kurtosis < -1) except the data of the Rosenberg Self-esteem Scale. The data of the RSES is normal when it comes to Skewness (0.43), which means that our data is relative symmetric, but Kurtosis shows a peaky distribution (*kurtosis* > +1). This means that the data on this scale is heavy-tailed and thus highly concentrated around the mean (Figure 3).

Table 2

Means, standard deviations, and correlations among self-esteem, SDU and ODU.

Scales	M	SD	α	Skewness	Kurtosis	1.	2.	3.
1. RSES	20,41	4,60	,865	,430	1,223	-		
2. ODU	5,73	1,89	,559	,303	-,345	-,030	-	
3. SDU	9,23	2,30	,715	,424	,668	-,138**	-,239**	-

Note. RSES = Rosenberg Self-Esteem scale; ODU = Other Directed Use scale; SDU = Self Directed Use scale.

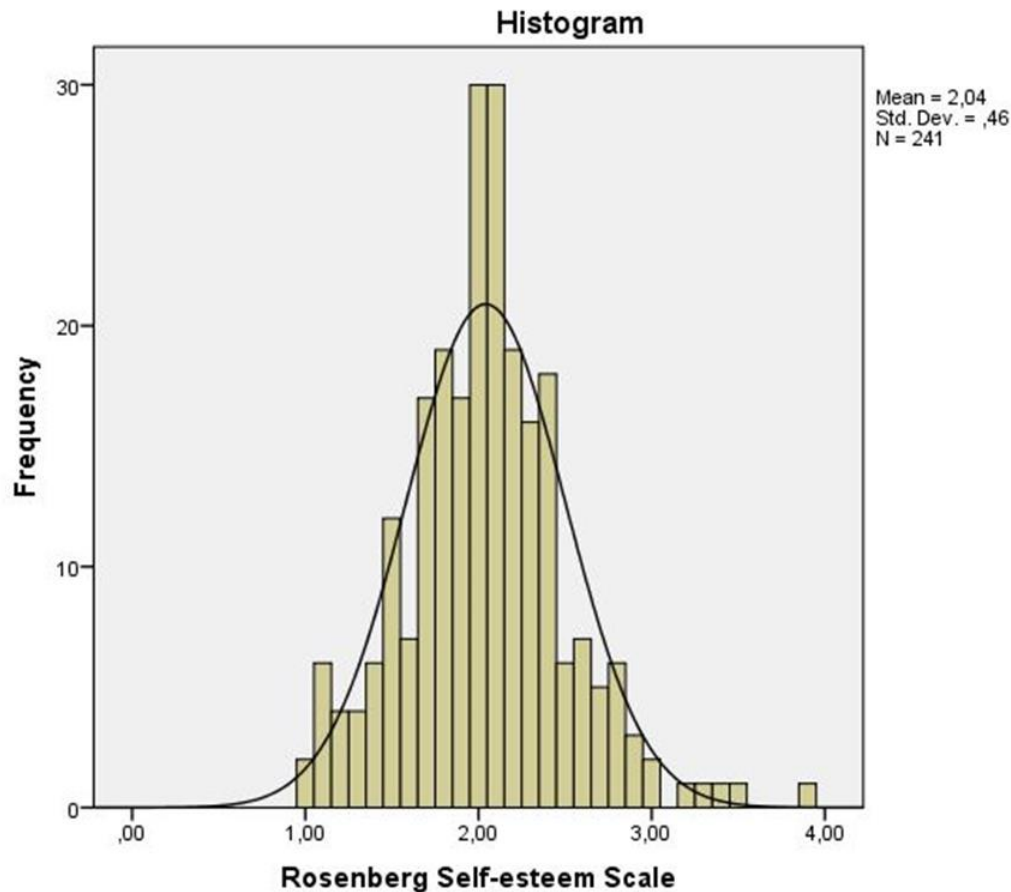**. Correlation is significant at the 0.01 level (2-tailed).

Figure 3. Data distribution of the RSES.

Correlational analysis

In order to test hypotheses 1, 2, 3, 5 and 6, Pearson's correlations were conducted.

A significant negative medium strength correlation was found between SDU and self-esteem ($r = -{,}138$; $p < .05$). Participants that scored high on SDU scored low on self-esteem which contradicts hypothesis 1. In line with hypothesis 2, a significant positive correlation was found between SDU and gender ($r = .177$; $p < .05$). Hence, women are connected to a frequent self-directed use and men are connected to a less frequent self-directed use. Furthermore, a significant positive correlation was found between gender and self-esteem ($r = .15$, $p < .05$). Which means that women show higher levels of self-esteem and men show lower levels of self-esteem. This is contradicting to hypothesis 3.

Between ODU and self-esteem no significant correlation was found ($r = -.03$; $p > .05$). Therefore, ODU seems not to be associated with self-esteem and thus no support for hypothesis 5 was found. Moreover, a significant negative correlation was found between ODU and gender ($r = -.14$; $p < .05$). This means that men are connected to a frequent other-

directed use and women are connected to a less frequent other-directed use. This finding is in line with hypothesis 6.

Moderation analysis

A hierarchical multiple regression analysis was conducted to test if gender moderates the relationship between SDU and self-esteem and the relationship between ODU and self-esteem.

Gender as a moderator between SDU and Self-esteem

Within the first multiple regression model, the independent variables SDU and gender were included. These variables accounted for a significant proportion of the variance in self-esteem, $R^2 = .05$, $F(2, 238) = 6.38$, $p < .005$.

Next, an interaction term between SDU and gender was created and added to the multiple regression model. This second model did not account for a significant amount of variance in self-esteem, $R^2\ change = .003$, $F(1, 237) = 4.49$, $p > .05$, $b = .160$, $t(237) = .846$, $p > .05$. Therefore this model did not account for significantly more variance than just SDU and gender by themselves. As a result, gender does not moderate the relationship between SDU and self-esteem and hypothesis 4 can be rejected.

Gender as a moderator between ODU and Self-esteem

For the moderation analysis with ODU, the independent variables ODU and gender were included in the first multiple regression model. These variables did not account for a significant proportion of the variance in self-esteem $R^2 = .023$, $F(2, 238) = 2.807$, $p > .05$.

The interaction term between ODU and gender was created and added to the multiple regression model. This second model too did not account for a significant amount of variance in self-esteem, $R^2\ change = .001$, $F(1, 237) = 1.973$, $p > .05$, $b = -.071$, $t(237) = -.567$, $p > .05$. This model can therefore not account for significantly more variance than just ODU and gender on themselves. Respectively, the relationship between ODU and self-esteem is not moderated by gender and hypothesis 7 can thus be rejected.

Conclusion and Discussion

The aim of this research was to examine whether there are gender differences in the relationship between the type of use on Instagram and self-esteem. In this research, type of use was assessed by Self-Directed Use (SDU) and Other-Directed Use (ODU). First, findings

regarding SDU will be discussed and interpreted. Second, findings regarding ODU will be discussed and interpreted. Third, strengths and limitations of the current research will be considered and connected to implications and recommendations for future research, and finally an overall conclusion will be given.

Does gender moderate the relationship between SDU and self-esteem?

The analysis of the results revealed a moderate negative correlation between SDU and self-esteem. Which means that participants with high scores on SDU showed lower self-esteem levels and vice versa. This result is in contrast with the assumptions of past research that actions such as viewing and editing your own profile (in this study assigned as SDU) enhances the self-esteem of the user (Gonzales and Hancock, 2011). According to the literature a person's self-esteem may guide the person's social media use (Andreassen et al. 2016; Krämer & Winter, 2008), but also using social media is associated with a decrease or increase of the person's self-esteem (Valkenburg, Peter & Schouten, 2009; Vogel et al. 2014; Gonzales & Hancock, 2011; Donnely & Kuss, 2016). Therefore, the finding that participants with low self-esteem make more SDU than participants with higher self-esteem could possibly be explained by the literature determining that people with low self-esteem are making more use of social media (Krämer & Winter, 2008) and engage more in self-promoting and self-esteem raising activities/online content (Krämer & Winter, 2008; Mehdizadeh, 2010) which can be described as self-directed use (SDU). The present research assumed self-esteem to be determined by the type of use on Instagram. This decision was based on a high amount of past research confirming that social media use can have an impact on the user's self-esteem (Tandoc et al., 2015; Gonzales & Hancock, 2011; Vogel et al., 2014; Donnely & Kuss, 2016;Valkenburg, Peter & Schouten, 2009). Furthermore, the literature review showed that Instagram is rated as the social media platform with the most negative impact on mental health which made determining the impact of Instagram use on self-esteem of bigger interest (RSPH, 2017). All in all, examining whether the type of social media use may be associated with changes in self-esteem seemed plausible. Nevertheless, the expectation that high SDU leads to lower self-esteem could not be confirmed and therefore the impact of self-esteem on social media use might be of greater value than predicted by the literature until now.

Moreover, in the literature self-esteem is described as a two-sided construct. Namely as stable trait that develops with time and as a fluid state which is sensible to situational changes (Heatherton & Polivy, as cited in Vogel et al., 2014, p. 207). Self-esteem in this

research was measured with the Rosenberg Self-Esteem scale which examined general self-esteem as a stable trait. Another possible explanation for the inconsistent result therefore might be that general self-esteem is too broad to measure the construct of interest and thus the expected results could not be obtained.

Furthermore, this research indicated that women have the tendency to make a more frequent self-directed use on Instagram than men, as a positive correlation was found between SDU and gender. This is in line with previous findings which stated that women are more active in composing profiles (Haferkamp et al., 2012) and that women are more engaged with a positive self-presentation on social media (Tufekci, 2008).

Additionally, a positive correlation was found between gender and self-esteem. Consequently, females showed higher self-esteem levels than males. This finding is contradicting to what was being expected from the literature. Findings of past research revealed that males are associated with higher self-esteem levels than women (Kling et al., 1999; Maccoby & Jacklin, 1974; Bachman et al., 2011). One possible explanation for this contradicting result could be the unequal distribution of males and females in this research, with a clear underrepresentation of men. Especially because the literature describes the founded gender differences in self-esteem as small or slight (Kling et al., 1999; Bachman et al., 2011). Therefore it could be concluded that due to the unequal distribution, the sample was not good/fitting enough to find the predicted small/slight differences.

To give an answer to the research question, the essential part of the analysis was the analysis of the moderation effect of gender on type of use (SDU and ODU) and self-esteem. No moderating effect of gender was found between the relationship of SDU and self-esteem. As a result, gender can therefore not be understood as a buffer between SDU and self-esteem which is contradicting to the expectations that were grounded on past research (Gonzales & Hancock, 2011; Haferkamp et al., 2012, Tufekci, 2008). However, the previous results showed that women and men differ between the favoured type of use and on self-esteem levels. As stated previously, a possible explanation for this contradicting finding is the point that this research focussed on general trait self-esteem. Hence, utilizing general self-esteem instead of self-esteem as a fluid state may have caused the inconsistent findings. Gender should therefore not be eliminated as a possible moderator.

Does gender moderate the relationship between ODU and self-esteem?

This study found no relationship between ODU and self-esteem. As a result, an association between the self-esteem of the user ODU seems not to exist. This is contradicting past

research that revealed a negative correlation between ODU and self-esteem due to negative upward comparison (Tandoc et al., 2015; Gonzales & Hancock, 2011; Vogel et al., 2014; Donnely & Kuss, 2016). A possible explanation to this contradicting finding could be the questionable reliability of the ODU-scale. Additionally, as mentioned before, the point that general trait self-esteem was used in this research could also be a possible explanation why the assumed results could not be found in this research.

Furthermore, a negative correlation was found between ODU and gender. Hence, men tend to make a more frequent other-directed use than women. This finding is consistent with previous research that revealed that, compared to women, men are less active in composing profiles, more active in finding friends (Haferkamp et al, 2012) and less concerned with creating a positive self-presentation (Tufekci, 2008). Therefore, men's social media use may be described as less self-directed and more other-directed.

The analysis of the moderation effect of gender on the relationship between ODU and self-esteem was next to SDU, the second essential part to give an answer to the overall research question. Just as for SDU, gender also was found to not moderate the relationship between ODU and self-esteem. This, despite not in line with the expectations, seems to be logical when taking in account the result that no correlation was found between ODU and self-esteem. Therefore, the point that no moderation effect was found could be explained due to the poor reliability of the ODU-scale. Furthermore, when interpreting and discussing this result, the focus on general trait self-esteem in this research may have played a role as well here.

Strengths and limitations & implications for future research

The current research offered a number of strengths. First of all, due to the short time span available for the data collection of this study, the generalizability of the sample can be described as good. The age of the participants was very representative of the target group (18-29) which are the most frequent users of social media. Furthermore, the amount of participants was clearly >100 which is a general criterion to conduct a relative reliable research. Additionally, the quantitative data collection of this research can also be assigned as a strength, as it serves for simple replication and documentation in the future.

Moreover, this research offers a contribution to the research gap on differences between men and women, by showing that gender might predict differences in the type of use, and on self-esteem levels. These findings add to the findings of past research (Haferkamp et

al., 2012; Tufekci, 2008; Joseph, Markus and Tafarodi, as cited in Gonzales & Hancock, 2011).

Finally, findings of this research emphasized the relation between self-esteem and social media use. Thus, contributing to the research on social media and mental health and adding related findings about the recent growing social media platform Instagram. More insights are found on the relationship between Instagram use and self-esteem which can provide a good starting point for future research.

However, when interpreting the results, some limitations of this research should be taken into account. The first limitation is concerned with the reliability of the scales used to measure Instagram use. As mentioned, the two scales Self-Directed-Use-Scale and Other-Directed-Use-Scale were conducted specifically for this research. The statistical analysis showed that the reliability of the ODU-scale is questionable, because of low internal consistency. This provides no optimal conditions to draw general conclusions from this research and its results. As a result, validation analysis and improvement of validation and reliability of the scale is recommended and necessary for future research to encounter more reliable results.

The second limitation is based on the used research design. A cross-sectional online survey design was used due to the several benefits of a low amount of money and time needed. However, the fact that the data is measured at only one point in time makes it impossible to speak about causal inferences (Levin, 2006). Especially as this research treats self-esteem as a stable trait, a longitudinal research could have offered different results. Furthermore, a survey design might be not sufficient to measure the constructs of interest. For example in an experimental design, SDU and ODU could directly be observed by recording participants online activities instead of letting people estimate their online activities themselves. Furthermore, as self-esteem is also a fluid state. Direct measures such as done by Gonzales & Hancock (2011), could be very valuable by assessing self-esteem directly after the participants received positive or negative feedback. In their research, they made use of an experimental design where participants had to do some actions on social media and "After being on Facebook for 3 minutes, the experimenter returned with a survey. Participants were instructed to keep the profile page open while completing the questionnaire." (Gonzales & Hancock, 2011, p.80). Therefore, it is suggested for future research, to make use of research methods that can offer more insights into the constructs of interest. This means that experimental designs or qualitative research such as interviews should be considered as well

to receive more high qualitative information about how gender can influence the interrelation between self-esteem and social media use.

The last limitation is based on the sample used in this research. The employment status as well as gender was not distributed equally in the data. Especially a high amount (80%) of psychology students of the University of Twente was present in the study due to the use of the online survey pool for psychology students called Sona Systems. Additionally, gender was unequally presented with 81% females and 19% males. Representativeness of the sample is therefore not ideal to draw general conclusions. Especially because gender seems to play an important role for self-esteem and social media use (Haferkamp et al., 2012, Tufekci, 2008; Barker, 2009). A more equal sample could therefore possible offered different results. For example as the results showed an abnormal distribution of the data of the Rosenberg Self-esteem scale with a high concentration around the mean. Possibly, this finding is connected to the high amount of female psychology students in this sample. Furthermore, the contradicting findings that women showed higher self-esteem than men, and importantly, that gender was not found to act as a moderator between SDU/ODU and self-esteem could have been in some relation to the unequal distribution of gender.

Additionally and important to mention is, when elaborating the research on self-esteem and social media use, self-esteem should be treated as a two-sided construct and an interrelation between self-esteem and social media use has to be considered. People with low self-esteem seem to make more use of social media (Krämer & Winter, 2008), more social media use leads to more social upward comparison (Mehdizadeh, 2010) which in turn is assumed to lead to low self-esteem (Tandoc et al., 2015; Gonzales & Hancock, 2011; Vogel et al., 2014; Donnely & Kuss, 2016). Future research should encounter correlations in both directions. Therefore more elaborated models and relations have to be conducted as well, in order to determine how mental health and social media use are associated with each other.

Conclusion

In conclusion, past research has shown that social media use is negatively associated with the user's self-esteem and that gender might predict differences between this association. According to the current research gender was not found to moderate the relationship between type of use on Instagram and self-esteem. Nevertheless, findings of the current research can form a basis for future research investigating if gender acts as a moderator between self-esteem and social media use. Research on and development of methods and interventions to make people more aware and capable in dealing with social media is necessary. Especially

because of the constant growth of social media platforms such as Instagram and its attractiveness for young adults (Jackson & Luchner, 2017). This need can also be confirmed by the RSPH (2017) which is stating "Social media isn't going away soon, nor should it, We must be ready to nurture the innovation the future holds."(p.5). They and the current research as well are calling for methods that make users able to use social media in a mental health protecting and promoting way. Then, negative impacts on the user's self-esteem and mental health in general can be reduced and social media can unfold its positive and originally intentions on its users, namely socializing, connecting, making friends and maintaining relationships.

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Appendix:

Appendix A: Self-Directed Use Scale (SDU)

When I use Instagram...

	Never (0)	Sometimes (1)	Often (2)	Almost always (3)
I post a picture				
I post video				
I post a story				
I edit my profile				

Appendix B: Other-Directed Use Scale (ODU)

When I use Instagram...

	Never (0)	Sometimes (1)	Often (2)	Almost always (3)
I look at my profile/pictures/videos				
I scroll through the newsfeed				
I watch the stories of other people				
I am exploring the discovery modus (🔍)				

Appendix C: General Information for the participants

Thank you for filling out this survey.

Goal of this research:
Goal of this research is to research the relationship between social media use and mental health. Therefore we make use of an online questionnaire.

Expectations of the participant:
This research will take about 15 to 30 minutes to complete. A working internet connection and your own laptop/computer/tablet are required to successfully participate. During this research you have to answer multiple choice questions which will contain demographic data and your personal social media use related to psychological factors. Please carefully read the instructions before answering the questions and please answer the questions as honest as possible.

Further information:
All your information will be used only for academic purposes and will be treated anonymously. You can withdraw from this research at any time without giving explanations and without consequences. If you have any questions or complains feel free to contact us: n.feldkamp@student.utwente.nl, f.seeger@student.utwente.nl, c.m.neumann@student.utwente.nl & s.bohlouli@student.utwente.nl.

Informed consent
I hereby declare that I have been informed in a clear manner about the aim and method of this research. Furthermore I participate on my own free will and I am aware that I can withdraw from this research at any time without reasoning. Information about anonymity and how to get in contact with the researchers in case of questions or complains are clear to me.

Are you willing to proceed with this survey?
- Yes
- No

[Questionnaire starts]
[Questionnaire ends]

Thank you very much for participating.
Contact: n.feldkamp@student.utwente.nl, f.seeger@student.utwente.nl, c.m.neumann@student.utwente.nl & s.bohlouli@student.utwente.nl.