

The relationship between Social media use, the personality trait neuroticism and depression: The mediating effect of neuroticism on the relationship between social media use and depression.

Bachelorthesis

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### Abstract

**Background.** Social media use is integrated in the daily routine of about one third of the world population. That is why it is important to understand the negative effects of social media use like fear, low self-esteem, stress and depression on individuals psychological well-being. Further, certain personalities seems to be associated with negative effects of social media use than others. Neuroticism seems to be related to depressive symptoms due to using social media. In this current study, the relationship between social media use, neuroticism and depression is studied. More precisely, if neuroticism mediates the relationship between social media use and depression.

**Methods.** Through a cross-sectional online survey-based design, the relationship of social media use, neuroticism and depression is explored. 228 respondents were selected and among those were 173 (75,9%) female and 55 (24,1%) males between the age of 18 to 45 ( $M=21.22$ ,  $SD=2.82$ ). Respondents were asked about the time they daily spend on social media. Further, respondents also had to fill in the Beck's Depression Inventory and the subscale neuroticism out of the Big Five Inventory questionnaire.

**Results.** Findings showed, that there is a statistically significant positive correlation between social media use, neuroticism and depression. Furthermore, findings also showed that neuroticism is operating as a mediator between the relationship of social media use and depression.

**Conclusion and discussion.** With neuroticism, possibly one underlying mechanism through which social media use is associated with depression is discovered. A conscious usage of social media to protect mental health is an important topic in our society. To protect oneself from negative influences of social media use, it seems to be important to know about one's own personality and how the usage of social media could have an impact on our psychological well-being. Possible risks that time spending on social media could have on one's psychological well-being and specially on people with the personality trait neuroticism could be suffering from depressive symptoms and suffering from the consequences of low self-esteem.

*Keywords:* Social media, neuroticism, depression, mental health.

## **1. Introduction**

### **1.1. Social media use**

Social media use is integrated in the daily routine of 2.46 billion people worldwide, which is 32,6 percent of the world population in 2017 (Statista, 2018). In 2017, social media use was seen as the most popular online activity with 71% of internet users being social media users and these numbers are expected to grow (Statista, 2018). Per definition, social media signifies media technologies that allow users to connect through the internet and is a tool for communication, developing and maintaining relationships (Agozzino, 2016). Although there is not one specific social media platform, still there is one similarity between them, namely that all are based on user generated content. This implies that the existence of social media platforms are assured through the substance that their users are creating. Accordingly, this creation is a profile in the form of text, pictures, audio and/or video (Drury, 2008). Through those profiles, people present themselves, compare themselves with other users and comment and like each other's contents (Chua & Chang, 2016). Besides, social media could be used as an environment to express art, earn money, get famous and also find a partner. Furthermore, it is a place to gain support through one's social capital, which generates a sense of bonding and belonging, which in turn positively contributes to one's psychological well-being (Shpigelman, 2016).

### **1.2. Social media use and mental health**

Psychological well-being, also referred to as mental health or positive psychological functioning is understood as self-acceptance, positive relationships with others, autonomy, environmental mastery, purpose in life and personal growth (Ryff & Singer, 1996) and can be positively affected by social media use. Building positive relationships with others describes an empathetic person who maintains and care about interpersonal relations and can identify with others (Ryff & Singer, 1996). This concept of mental health relates positively to social media use, because spending time on social media can remarkably increase the interaction with others (Moorhead et al., 2013). Through those interactions, relationships can be established, for example between those who search and those who provide information about a mental health topic and perceiving things from each other's perspectives also becomes possible.

Although social media is a place to gain support, its use is also associated with several negative effects on mental health. The first example is that one's sense of identity can change,

which is also called depersonalization, through extreme fatigue or stress, emotional turmoil, and intense fear (Kerr, 2013). This change of self-perception, for example after publishing a picture on social media and receiving fewer likes than expected, is associated with wrong expectations, the unfulfilled need for social approval, the fear of rejection and facing of refusal (Shpigelman, 2018). Being active on social media and for example not gaining the approval that was expected from others, thus being dependent on other users opinions, could have a negative impact on mental health (Ryff & Singer, 1996). The second example is that the fear of missing out leads users to compulsive and increasing frequencies of social media use (Dhir, Yossatorn, Kaur, Chen, 2018). Being constantly exposed to the informative and communicative overloads on social media platforms, simply to stay up to date, users could suffer from mental exhaustion. This increase in social media use could result in addictive behavior of using social networking sites, which in turn again predicts depression in social media users (Donnelly & Kuss, 2016). The third example is that using social media also puts users in the position to become a victim of cyberbullying, which is an act of aggressive behavior over a period of time through social networking sites (Quintana-Orts & Rey, 2017). Thereby, the consequences of being a victim of cyberbullying could include eating disorders, poor self-esteem, suicidality and substance abuse. In addition, negative emotions like shame, anger, sadness, frustration, guilt and helplessness are negative effects of online harassment (Quintana-Orts & Rey, 2017). Besides, being a victim of cyberbullying is positively associated to depression (Quintana-Orts & Rey, 2017). The last example is that the comparison of one's own life with the most beautiful and meaningful moments of others life's, which are presented on social media, can lead to low self-esteem and low self-worth (Valkenburg, Peter, Schouten, 2006). Furthermore, a negative comparison of oneself with others, is positively related to depression (Blachnio, Przepiorka, & Pantic, 2015) and in this matter, depression is also positively associated with low self-esteem (Donnelly & Kuss, 2016). Further, a depressed person, who needs the approval of others, is more likely to use the internet more often (Blachnio, Przepiorka, & Pantic, 2015). Based on this paragraph, it seems that social media could have a negative influence on mental health.

In the following years, the continuous increase of social media use is predicted (Statista, 2018) and several studies are interested and have shown the positive relation of social media use and depression (Pantic et al., 2012; Donnelly & Kuss, 2016). Therefore, the current study attempted to study the important relation between social media use and

depression, to also realize possible factors which could influence this relationship.

### **1.3. Social media use and depression**

Depression is a common psychiatric mood disorder, with more than 300 million people affected worldwide (World Health Organization, 2018). The risk of depression is known to be twice as high among women than men (Kessler, 2003). Symptoms of depression are loss of interest and enjoyment, reduced energy, anxiety, disturbed sleep and appetite, feelings of guilt or low self-worth and poor concentration (World Health Organization, 2018). At its worst, this disorder can lead to suicide incidences and can have a negative impact on the economic status and the social environment of the persons concerned. At its mild form, depression already can lead to difficulties in continuing with ordinary work and social activities, so functioning completely will be reduced.

Referring to social media use, symptoms of depression are positively correlated with the amount of time that users spend on networking sites (Pantic et al., 2012). For example, to achieve common goals, like gaining more followers on Instagram or receiving more likes and comments on posts placed on social media, users compete with each other by spending a high amount of time on social media, to avoid feelings of depression caused by not being successful (Donnelly & Kuss, 2016). Senormanci et al. (2014) also signified that low self-esteem is a primary component of depression. These feelings of depression could occur due to upward social comparison on social media platforms which can lead to low self-esteem, because users compare themselves for example with the privileged lives of famous people they follow on social media (Donnelly & Kuss, 2016). This goes in line with the statement that low self-esteem is associated with social media use (Banyai et al., 2017).

Also many research has been done to come to know, if there is a certain personality trait, which could be associated with social media use and depression (Chow & Wan, 2017; Blachnio et al., 2015; Hughes et al., 2012; Muris et al., 2005). Research showed that depression is positively linked to neuroticism and also that people with the personality trait neuroticism have a low self-esteem (Muris, Roelofs, Rassin, Franken, & Mayer, 2005). Furthermore, a positive association was found between the time spent on Facebook and depressive symptoms among those high in neuroticism (Chow & Wan, 2017). Therefore, the exploration of the relationships between depression, social media use and neuroticism are emphasized in the current study. More specifically, if neuroticism has an mediating influence

on the relationship between social media use and depression.

#### **1.4. Social media use and neuroticism**

Neuroticism is one of the five personality traits of the Big Five model, which is emerged through a factor analysis and is based on common language descriptors of personality (Kotov, Games, Schmidt, & Watson, 2010). Characteristics of this personality trait are sensitivity, nervousness and a tendency to worry (Hughes et al., 2012). Furthermore, people with the personality trait neuroticism are emotionally unstable and are struggling with negative feelings while confronting stressful situations (Kayis et al., 2016). Because neurotic personalities experience negative emotions more often after unfavorable social comparison, which is for example comparing oneself with idealized images of other users on social media platforms, an abundant exposure to those images might have a negative impact on their well-being (Chow & Wan, 2017). Furthermore, neurotic people tend to present ideal and false representations of themselves (Chow & Wan, 2017). At first, those created positive self-images lead the person feel gratification, but the knowledge of the fake identity can lead the person to dissatisfaction with their lives and development of depressive symptoms (Donnelly & Kuss, 2016). Furthermore, neurotic people have trouble making and maintaining healthy relationships to others (Senormanci et al., 2014). Rather, they prefer passive engagement on social media, like viewing others profiles and checking updates, which can weaken the psychological well-being of neurotic people (Chow & Wan, 2017).

Neuroticism is positively related to being addicted to the internet (Kayis et al., 2016). Also, high levels of neuroticism in females is positively related to the social usage of the internet (Hughes et al., 2012). Hughes et al. (2012) argued that people with a high score on neuroticism, use the internet more frequently and a positive correlation has been found with the amount of time that they spend on Facebook. Furthermore, neuroticism was found between those highly active on social media (Stead & Bibby, 2017). Hughes et al. (2012) further stated that neuroticism is related to a high internet use especially in relation to social use, to avoid loneliness and anxiety and to create a sense of group belonging.

To underline the relationship between social media use, neuroticism and depression, Chow & Wan (2017) stated that a positive relationship between the time spend on Facebook and depression was only found among people with the personality trait neuroticism. That is why further research is needed to investigate whether neuroticism acts as an mediator between

the relationship of social media use and depression. Because there are more factors than personality traits that could influence the relationship between social media use and depression, further research will consider this relationship as consisting but with an decreasing association, when including neuroticism to this relationship.

### 1.5. Current research

Based on this literature review, the following research question was developed: *How is social media use correlated with depression and does neuroticism mediates this relationship?*

The aim of this study is to examine whether people who spend a high amount of time on social media are at risk to suffer from depression and explore if neuroticism mediates this relationship. The conceptual model can be found in Figure 1.

The following hypotheses have been formulated:

H1: Social media use, neuroticism and depression are positively related to each other.

H2: Social media use predicts depression.

H3: Neuroticism mediates the relationship between social media use and depression.

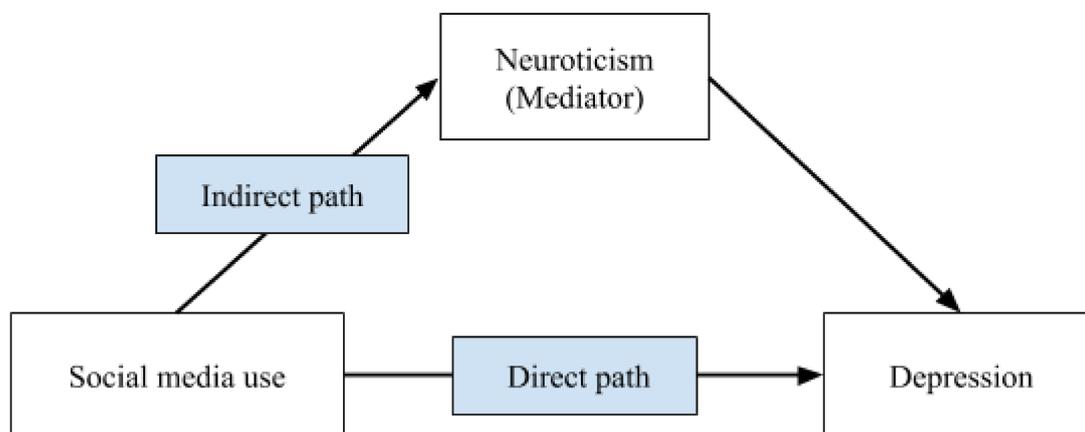


Figure 1. Hypothesized conceptual model of the Relationship between Social media use, Neuroticism and Depression.

## 2. Methods

### 2.1. Design

This research is a quantitative study with a cross-sectional online survey-based design, where the relationship between social media use, neuroticism and depression was

investigated. The advantages of a quantitative study are that the research is controlled, objective and tests the validity and reliability of the results (Marshall, 1996). In addition, high levels of reliability of collected data can be achieved due to a large amount of respondents. The aim of this design is, to draw a representative sample from the population, whereas results can be generalized to that population (Marshall, 1996). Furthermore, a cross-sectional online survey design is chosen because data is collected faster and at a lower cost and patterns of associations are more robust because individual irregularities are not visible due to the high amount of respondents (Heiervang & Goodman, 2009). This design includes the independent variable “social media use”, which is measured by the amount of hours per day someone spend on social media platforms. The dependent variable is “depression”. Furthermore, the goal of this research is to investigate, whether the personality trait “neuroticism” is a mediator between social media use and depression.

## **2.2. Participants**

Participants were approached through convenience sampling. This non-probability sampling was chosen, because respondents had to be selected whenever and wherever the possibility occurred. Convenience sampling is most commonly used, is less expensive and there is no need for a list of all the specific respondents of one population (Acharya, Prakash, Saxena, & Nigam, 2013). Respondents were reached via social media and an university tool named “SONA-systems”, which will be described in section 2.4. The inclusion criteria, to take part in this survey were a sufficient knowledge of the English language and respondents had to be 18 years old or older. Participants who did not use social media at all were excluded from this study. Furthermore, participants who did not finish the survey or did not filled in the questionnaires as a whole, were also excluded.

Screening of the data showed, that in total 358 participants volunteered to take part in this study, where 228 respondents were selected for this study by means of the inclusion and exclusion criteria and by excluding respondents. Hereby outliers as well as extremes were excluded to achieve cut-off scores between +1 and -1 for Skewness and also for Kurtosis to obtain normal distributed data. Among those respondents, there were 173 (75,9 %) females and 55 (24,1 %) males, between 18 and 45 years old ( $M=21.22$ ,  $SD=2.82$ ). Further specific characteristics about the respondents are mentioned in table 1.

Table 1

*Socio-demographic characteristics of the participants (N=228).*

<i>Item</i>	<i>Category</i>	<i>Frequency</i>	<i>Percentage</i>
Gender	Female	173	75,9
	Male	55	24,1
Age (years)	18-20	107	46,9
	21-25	115	50,4
	26-30	4	1,8
	31-35	0	0
	36-40	1	0,4
	41-45	1	0,4
Nationality	Dutch	33	14,5
	German	179	78,5
	Other	16	7,0
Current job/ education	Student	203	89,0
	Full-time worker	23	10,1
	Part-time worker	2	0,9

### 2.3. Measuring instruments

First of all, this survey was carried out in collaboration with three other researchers, who answered different research questions about the same topic. That is why this study made use of four out of seven various questionnaires, which the survey was made of.

**2.3.1. Demographics.** First of all, participants were asked to answer four demographic questions regarding age, nationality, gender and current job or educational activity. By way of illustration, asking for a person's nationality was divided in the following three answer options: “Dutch”, “German” and “Other, namely ...”.

**2.3.2. Social media use.** The current study used the following question to analyse the

amount of time participants were spending on social media per day and is listed as: “On average, how many hour/hours do you use social media per day?”. The five response options are called: “Less than one hour”, “1 to 2 hours”, “3 to 4 hours”, “5 to 6 hours” and “Other, namely:...”. The internal consistency of this item is not defined because the variable of social media use results from a single item scale, which is taken at one point in time and is established by the researcher.

**2.3.3. Beck's Depression Inventory.** Third, the Beck's Depression Inventory (BDI) which is developed by A. T. Beck, was used to measure the severity of depression by rating symptoms of depression such as hopelessness and irritability, insights such as guilt or feelings of being punished, as well as physical symptoms such as fatigue, weight loss and lack of interest in sex (Beck, Steer, & Garbin, 1988). The internal consistency of the BDI in the current study is  $\alpha = 0.68$ . The BDI is a self-reported psychometric inventory with 21 items about how the respondent has been feeling in the past two weeks. Each item has a set of four possible responses with extending intensity. The level of depression has to be found out by adding up the scores of the 21 items, which ranges per item from 0 to 3. The higher the amount of the scores, the higher the level of depression of the respondent. By way of illustration, with item 16, the respondent has to choose between: “I can sleep as well as usual”, “I don't sleep as well as I used to”, “I wake up 1-2 hours earlier than usual and find it hard to get back to sleep” and “I wake up several hours earlier than I used to and cannot get back to sleep”. The complete questionnaire can be found in the Appendix 1.1.

**2.3.4. Big Five Inventory.** Fourth, the subscale ‘neuroticism’ of the Big Five Inventory (BFI) which is constructed by John, Donahue, and Kentle (1991), was used to measure the personality trait neuroticism. This subscale has 8-items, which aimed to only measure whether the respondents have the personality trait neuroticism or not. One example of an item is: “I see myself as someone who worries a lot”. Those items were scored on a five-point Likert-scale ranging from “disagree strongly” to “agree strongly”. The stronger respondents agreed with the statements, the higher they scored on the neuroticism scale. Before analyzing however, there are three items, whose scores had to be reversed, because low scores on those items: “Is relaxed, handles stress well”, “Is emotionally stable, not easily upset” and “Remains calm in tense situations” correlate positively with neuroticism. The internal consistency of this subscale in the current study equals  $\alpha = 0.77$ .

#### **2.4. Procedure**

Before approaching participants, the study was authorized by the BMS Ethic Committee of the University of Twente. Partially, participants were students of the University of Twente, which were gathered together with the help of a tool named “SONA-systems”. This tool is provided from the University of Twente for students, who aim to collect data as a researcher and also for students, to participate in others studies. Other participants were recruited through social media via a link, which lead to the online survey. This link was posted on social media sites like Facebook, and friends and family were asked to participate with a recruitment message about the aim and estimated duration (15-30 minutes) of the study. The data from all participants were gathered together in an online tool named “Qualtrics”, with which the online survey also had been created. Qualtrics is a web-based survey tool to build a survey from scratch, then to send the link of the questionnaire to participants and analyze the data of respondents after data collection. Qualtrics interconnects the researcher with the participants, and the data with the analysis tool SPSS.

First of all, participants were introduced to the survey by the introduction to the goal of this research, which is to analyze the relationship between social media use and its negative effects on mental health. The introduction also mentioned the expectations that had to be adhered, like to have a stable internet connection and to read the questions carefully. Next, some general information about the conditions of the study were given, like the estimated duration of 15 to 30 minutes, the anonymity and confidentiality of the data, the possibility to withdrawal from the study at any time and the email-address of the researcher was given for further questions. Second, the participants had to accept the informed consent form, where the accordance for the above mentioned conditions were stated, to proceed with the survey. After completing the survey some finishing words were directed to the participant. Participants were thanked for filling out the survey and the email-address of the researcher was shown again, in case of any comments or questions from participants. Participants also got the opportunity to use that email-address, to get informed about the results of this study.

#### **2.5. Data analysis plan**

The analyses were performed with the statistical program SPSS 25. First, the descriptive statistics were computed. Next, the Cronbach's alpha were determined, to describe the internal consistency (reliability) of the Beck's Depression Inventory scale and the subscale

of neuroticism. Hereby, an Alpha value of  $\alpha > 0,70$  was assumed to be acceptable (Tavakol & Dennick, 2011). Further, Pearson's  $r$  coefficient correlations were determined, to measure the strength and direction of linear relationships between the variables social media use, neuroticism and depression. Hereby, for the variables social media use, neuroticism and depression, mean-scores, standard deviations, Skewness and Kurtosis were calculated. For Skewness as well as Kurtosis the cut-off scores of +1 and -1 were defined, to obtain a normal distribution of the data. The statistical significance was set at  $p < .05$ . Further, a mediation analysis was conducted, to determine whether social media use can predict depression and whether neuroticism is functioning as a mediator between the relationship of social media use and depression. This mediation analysis was conducted with the 'PROCESS' tool of Andrew F. Hayes in SPSS (Hayes, 2012).

### 3. Results

#### 3.1. Descriptive statistics, reliability and correlation

Table 2 displays the descriptive statistics for all variables of the mediation model and that the variables were normally distributed regarding the values of the Skewness and the Kurtosis. The Cronbach's alpha coefficients of the scale neuroticism ( $\alpha = 0.77$ ) was acceptable, due to the general reference for a Cronbach's alpha value of  $\alpha > 0.70$  (Tavakol & Dennick, 2011). The Cronbach's alpha coefficients of the scale BDI ( $\alpha = 0.68$ ) is questionable, because of a value  $\alpha > 0.60$  but  $\alpha < 0.70$  (J. Gliem, 2003; R. Gliem, 2003). The reliability of social media use could not be conducted because it is a single item scale, which is taken at one point in time.

Starting, pearson's correlation coefficients were analyzed to demonstrate, whether there is a significant and positive relationship between the variables social media use, neuroticism and depression (H1). This correlation is shown in table 2. The test showed, that more frequent social media use is associated with higher scores of neuroticism ( $r = 0.19$ ,  $N = 228$ ;  $p < .001$ ) and also higher scores of depression ( $r = 0.21$ ,  $N = 228$ ;  $p < .001$ ). Furthermore, the results also showed a positive correlation between neuroticism and depression ( $r = 0.50$ ,  $N = 228$ ;  $p < .001$ ). Thus, the first hypothesis that social media use, neuroticism and depression correlate positively with each other is supported.

Table 2

*Descriptive Statistics.*

<i>Item</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>α</i>	<i>Skewness</i>	<i>Kurtosis</i>	1.	2.
1. Social media use	228	2,56	0,77	-	0,01	-0,06	-	
2. Neuroticism	228	21,84	5,25	0,77	0,23	-0,03	0,19**	-
3. Depression	228	25,41	3,34	0,68	0,70	-0,39	0,21**	0,50**

*Note.* Pearson's *r* was calculated to examine the associations between all variables. \*\* $p < .001$ .

### 3.2. Mediation analysis

The mediation analysis was conducted, to determine, whether the variable social media use predicts the variable depression (H2) and whether the variable neuroticism mediates the relationship between social media use and depression (H3). Table 3 shows, that the regression of social media use on depression, ignoring the mediator, was significant,  $b = 0.91$ ,  $t(226) = 3.20$ ,  $p < 0.001$  (H2). Thereby, social media use explained 4% of the amount of variance in depression (Table 3). This indicates that individuals who use social media more frequently than other users, suggestively have a higher level of depressive symptoms.

Further, the regression of social media use on the mediator, neuroticism, was also significant,  $b = 1.31$ ,  $t(226) = 2.94$ ,  $p < 0.001$ . Here, social media use accounted for 4% of the amount of variance in neuroticism. Generally speaking, these results suggest that the more time users spend on social media, the higher the level of neuroticism of those users.

The mediation process also showed that the mediator (neuroticism), in the presence of social media use, was significant,  $b = 0.31$ ,  $t(225) = 8.29$ ,  $p < 0.001$ . This results showed that while social media is used, people who score higher on measures of neuroticism, also have higher levels of depressive symptoms.

Further, the analysis revealed that, in the presence of the mediator, social media use was a weaker predictor of depression,  $b = 0.50$ ,  $t(225) = 1.99$ ,  $p = 0.05$ , than without the presence of the mediator,  $b = 0.91$ ,  $t(226) = 3.20$ ,  $p < 0.001$ . This comparison can be seen in Figure 2 and indicates that the direct path between social media use and depression is weakened in the presence of the personality trait neuroticism. Furthermore, 27% of the

amount of variance in depression can be explained by the indirect path, with neuroticism as a mediator and social media use as an independent variable. That means, that there is a meaningful reduction in effect, with neuroticism as a mediator between the relationship of social media use and depression. The results also revealed a positive indirect effect with a confidence interval not including zero  $b = 0.40$ ,  $SE = 0.15$ ,  $95\% CI = [0.15; 0.71]$ . This supports hypothesis H3 and indicates that the relationship between social media use and depression is partly mediated by neuroticism.

Table 3

*Indirect effect of Neuroticism on the relationship between Social media use and depression.*

<i>Outcome: Depression</i>						
	<i>b</i>	<i>SE</i>	<i>t</i>	<i>p</i>	<i>LLCI</i>	<i>ULCI</i>
<i>Social media use</i>	0,91	0,28	3,20	0,00	0,35	1,46
<i>Model</i>	<i>R</i> <sup>2</sup>		<i>F</i>	<i>p</i>		
	0,04		10,26	0,00		
<i>Outcome: Neuroticism</i>						
	<i>b</i>	<i>SE</i>	<i>t</i>	<i>p</i>	<i>LLCI</i>	<i>ULCI</i>
<i>Social media use</i>	1,31	0,45	2,94	0,00	0,43	2,19
<i>Model</i>	<i>R</i> <sup>2</sup>		<i>F</i>	<i>p</i>		
	0,04		8,64	0,00		
<i>Outcome: Depression</i>						
	<i>b</i>	<i>SE</i>	<i>t</i>	<i>p</i>	<i>LLCI</i>	<i>ULCI</i>
<i>Neuroticism</i>	0,31	0,04	8,29	0,00	0,23	0,38
<i>Social media use</i>	0,50	0,25	1,99	0,05	0,01	1,00
<i>Model</i>	<i>R</i> <sup>2</sup>		<i>F</i>	<i>p</i>		
	0,27		41,02	0,00		
<i>Indirect effect</i>						
	<i>b</i>	<i>BootSE</i>			<i>BootLLCI</i>	<i>BootULCI</i>
<i>Neuroticism</i>	0,40	0,15			0,15	0,71

*Note.* *b* = unstandardized regression coefficient.

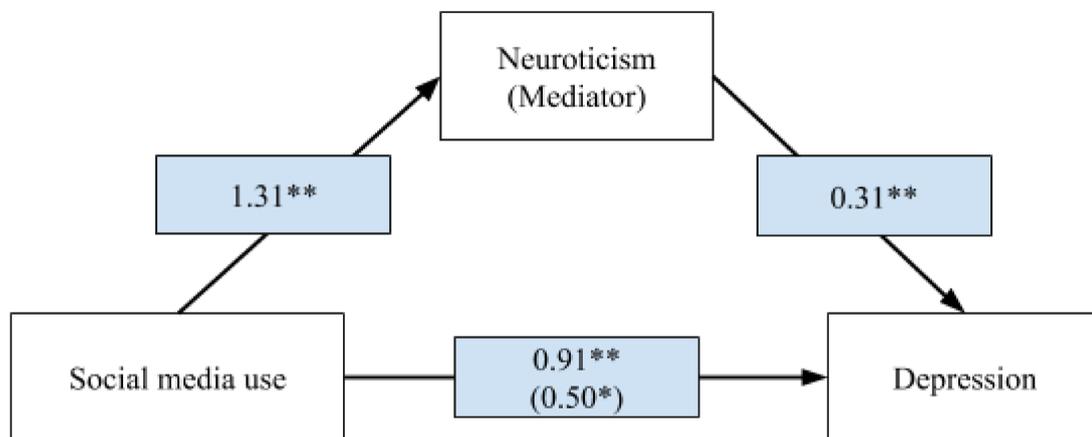


Figure 2. Overview of results. \* $p < .05$ . \*\* $p < .001$ . The value between the parentheses indicates the effect of the mediator.

#### 4. Conclusion and discussion

The purpose of the current study was to investigate the relationships between social media use, the personality trait neuroticism and depression. Specifically, the aim was to determine, whether social media use positively correlates with depression and whether neuroticism influences this relationship as a mediator. Results showed that there is a positive relationship between those three variables. This indicates that the more time a person spends on social media, the higher the level of depressive symptoms of that user and vice versa. This result is consistent with the findings of Pantic et al. (2012), who found a positive correlation between social media usage and symptoms of depression. Results of the current study also showed that the more time a person spends on social media platforms, the higher the level of neuroticism of that user and vice versa. This finding is in line with the statement of Hughes et al. (2012), who stated that neuroticism is positively related to the amount of time someone spends on Facebook. Furthermore, the current study also revealed that the higher someone scores on the personality trait neuroticism, the higher that person also scores on a depression scale and vice versa. This result is in line with previous research that stated that depression is positively related to neuroticism (Muris et al., 2005). The practical relevance of those findings are, that people with depression, neuroticism and/or high social media use might consider to be conscious about the amount of time they spend on social platforms and its potential negative

associations with their mental well-being e.g. low self-esteem, emotional instability, stress and anxiety (Banyai et al., 2017; Chow & Wan, 2017). Otherwise, individuals might find themselves trapped in a vicious circle between the impacts of depression, neuroticism and social media use.

Furthermore, results of the mediation analysis showed a minimal direct effect between social media use and depression, but displays a positive association between those two variables. This relationship is explained as the more time is spend on social media, the more depressive symptoms could appear. Looking at previous research papers, this result goes in line with the statement that excessive exposure to Facebook might lead to depression (Chow & Wan, 2017). Practically, this suggestion about the possibility of becoming depressed from using social media, could make people think about their behavior referred to the amount of time they spend on social media and could also motivate them to search for more information about this topic to expand their knowledge and to protect their mental health.

Results of the mediation analysis also showed that social media use has a rather small association with neuroticism, which is explained as the more time users spend on social media platforms, the higher they would score on a neuroticism scale. This result is supported by previous research that stated that the most active social media users, were those individuals that also score high on neuroticism (Stead & Bibby, 2017). Results of this analysis also showed that in the presence of social media use, neuroticism is positively associated with depression. That means that while using social media, the higher the level of one's neuroticism, the higher the level of one's depression. Further results have shown, that neuroticism partly mediates the relationship between social media use and depression. That signifies that there is a positive relationship between social media use and depression and that a meaningful reduction in the direct path between this relationship has been shown, when neuroticism mediates this relationship. When looking at previous research papers, those results are in line with the statement that the positive association between time spent on Facebook and depressive symptoms was only found among those high in neuroticism (Chow & Wan, 2017). The current study add to the existing literature by highlighting how neuroticism specifically influences the prior mentioned association, which is by operating as the mediator of this association. The practical relevance of this finding is that an element might have been found that has an mediating effect on the relationship between social media

use and depression and could help to identify and explain one mechanism behind psychological processes. For example, in order to treat depression, a new possible aspect for interventions could have been found, which might help alleviate symptoms of sufferers. For example, schools could arrange events to inform their students about the risks of social media use and for teachers to be able to intensively reach students who are at a higher risk of suffering from depressive symptoms, only those high in neuroticism could be invited to those events.

#### **4.1. Strengths & Limitations**

One of the limitations of the current study is that no causal relationship could be shown, because of the cross-sectional design of this study. Data were collected at a single point in time without considering what happened before or after that time. In other words, it cannot be said that neuroticism is actually influencing the relationship between social media use and depression and there is no definite information about cause-and-effect of this relationship. In further research, a causal link could be found by multiple assessments of neuroticism, depression as well as social media usage at different points in time with the guidance of a longitudinal study design. Hereby, repeated questions of the same variables could be asked over a period of time to make sure that the differences noticed in those people are less likely to be the result of other variables. Specifically, respondents could receive the same questionnaires as an automatically email once a month for one year.

The next limitation deals with the topic of unequal gender distribution. 75,9 % of the respondents were female; with previous research showing that women are twice as likely to suffer from depression (Kessler, 2003). Due to this fact scores from the Beck's Depression Inventory could have been falsified, because of the higher amount of women as respondents. Higher total scores on this depression scale could be the outcome, which would not be the case if women and men were selected equally. To determine, if the results of this study are biased by this distribution, future research could avoid random selection of gender to be able to generalize the findings, because it would then be representative for the whole population. A systematic sampling method could be used instead, to selected respondents from a defined list with equal gender distribution.

The next limitation is due to the fact that the internal consistency of the BDI in the current study equals  $\alpha = 0.68$  and this Cronbach's alpha is questionable. That means that the

results of the current study should be interpreted carefully. Further research could use the Beck Depression Inventory-II (BDI-II), to determine the level of depression, because the Cronbach's alpha for the BDI-II is shown to be higher than the Cronbach's alpha for the BDI (E. H. Lee, 2017; S. J. Lee, 2017, Hwang, Hong, & Kim, 2017).

Another limitation is based on the fact that there is only used one item to measure the variable social media use. Therefore, the reliability of social media use could not be conducted. But an one item questionnaire can be as effective as a multi item scale, if the single item is unambiguous and concrete (Wanous, Reichers, & Hudy, 1997).

One strengths of the current study is due to its quantitative characteristic. Provided data was expressed in numbers and because of the numeric form of the data, statistical tests could be applied in making statements about the data. Those statistical analysis drove important facts from researched data, including preference trends, differences between groups, and demographics.

Another strengths is due to the results of the current research. The knowledge about neurotic people being at higher risk of suffering from depressive symptoms relates to the added value of this research. There is no previous research found that could show the mediating effect of neuroticism on the relationship of social media use and depression. The knowledge about being at higher risk of depression could make people limit the time they spend on social media and keep track of the appearance and prevent depressive symptoms.

#### **4.2. Recommendations**

The results of this study are important, because they could be used to arouse the awareness of other researcher and to educate people who use social media, their parents, teachers and their social surroundings. It could be favorable to be cautious about the amount of time one spend on social media, to avoid a possible risk of depression. That is why an understanding of why people could benefit from changing their behavioral patterns concerning social media use is important. There are intervention aiming to change health behaviour to prevent the prevalence of an illness. For those interventions who aim to reduce depressive symptoms referring to high social media use, it could be relevant to know which target group could be at higher risk of developing depressive symptoms, which would be neuroticism in this current study. Further research could aim to conclude whether there is a causal relationship between social media use, neuroticism and depression and if neuroticism still is mediating the relationship between social media use and depression. If this would be

the case, those interventions could choose neurotic people as the target group and change their behaviour for example through increasing their self-esteem.

### **4.3 Conclusion**

This study investigated the relationship between social media use, neuroticism and depression. After implementing this research, it became clear that neuroticism mediates the relationship between social media use and depression, providing a first indication that neuroticism may be seen as a potential warning sign to look for when using social media and want to prevent depressive symptoms. In order to look after one's own psychological well-being, a conscious usage of social media seems to be important among individuals, especially persons with a neurotic personality.

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## Appendix

### Appendix 1: Survey questions

#### Appendix 1.1: Beck's Depression Inventory

##### Beck's Depression Inventory

This depression inventory can be self-scored. The scoring scale is at the end of the questionnaire.

1.
  - 0 I do not feel sad.
  - 1 I feel sad
  - 2 I am sad all the time and I can't snap out of it.
  - 3 I am so sad and unhappy that I can't stand it.
2.
  - 0 I am not particularly discouraged about the future.
  - 1 I feel discouraged about the future.
  - 2 I feel I have nothing to look forward to.
  - 3 I feel the future is hopeless and that things cannot improve.
3.
  - 0 I do not feel like a failure.
  - 1 I feel I have failed more than the average person.
  - 2 As I look back on my life, all I can see is a lot of failures.
  - 3 I feel I am a complete failure as a person.
4.
  - 0 I get as much satisfaction out of things as I used to.
  - 1 I don't enjoy things the way I used to.
  - 2 I don't get real satisfaction out of anything anymore.
  - 3 I am dissatisfied or bored with everything.
5.
  - 0 I don't feel particularly guilty
  - 1 I feel guilty a good part of the time.
  - 2 I feel quite guilty most of the time.
  - 3 I feel guilty all of the time.
6.
  - 0 I don't feel I am being punished.
  - 1 I feel I may be punished.
  - 2 I expect to be punished.
  - 3 I feel I am being punished.
7.
  - 0 I don't feel disappointed in myself.
  - 1 I am disappointed in myself.
  - 2 I am disgusted with myself.
  - 3 I hate myself.
8.
  - 0 I don't feel I am any worse than anybody else.
  - 1 I am critical of myself for my weaknesses or mistakes.
  - 2 I blame myself all the time for my faults.
  - 3 I blame myself for everything bad that happens.
9.
  - 0 I don't have any thoughts of killing myself.
  - 1 I have thoughts of killing myself, but I would not carry them out.
  - 2 I would like to kill myself.
  - 3 I would kill myself if I had the chance.
10.
  - 0 I don't cry any more than usual.
  - 1 I cry more now than I used to.
  - 2 I cry all the time now.
  - 3 I used to be able to cry, but now I can't cry even though I want to.

11.  
0 I am no more irritated by things than I ever was.  
1 I am slightly more irritated now than usual.  
2 I am quite annoyed or irritated a good deal of the time.  
3 I feel irritated all the time.
12.  
0 I have not lost interest in other people.  
1 I am less interested in other people than I used to be.  
2 I have lost most of my interest in other people.  
3 I have lost all of my interest in other people.
13.  
0 I make decisions about as well as I ever could.  
1 I put off making decisions more than I used to.  
2 I have greater difficulty in making decisions more than I used to.  
3 I can't make decisions at all anymore.
14.  
0 I don't feel that I look any worse than I used to.  
1 I am worried that I am looking old or unattractive.  
2 I feel there are permanent changes in my appearance that make me look unattractive  
3 I believe that I look ugly.
15.  
0 I can work about as well as before.  
1 It takes an extra effort to get started at doing something.  
2 I have to push myself very hard to do anything.  
3 I can't do any work at all.
16.  
0 I can sleep as well as usual.  
1 I don't sleep as well as I used to.  
2 I wake up 1-2 hours earlier than usual and find it hard to get back to sleep.  
3 I wake up several hours earlier than I used to and cannot get back to sleep.
17.  
0 I don't get more tired than usual.  
1 I get tired more easily than I used to.  
2 I get tired from doing almost anything.  
3 I am too tired to do anything.
18.  
0 My appetite is no worse than usual.  
1 My appetite is not as good as it used to be.  
2 My appetite is much worse now.  
3 I have no appetite at all anymore.
19.  
0 I haven't lost much weight, if any, lately.  
1 I have lost more than five pounds.  
2 I have lost more than ten pounds.  
3 I have lost more than fifteen pounds.

- 20.
- 0 I am no more worried about my health than usual.
  - 1 I am worried about physical problems like aches, pains, upset stomach, or constipation.
  - 2 I am very worried about physical problems and it's hard to think of much else.
  - 3 I am so worried about my physical problems that I cannot think of anything else.
- 21.
- 0 I have not noticed any recent change in my interest in sex.
  - 1 I am less interested in sex than I used to be.
  - 2 I have almost no interest in sex.
  - 3 I have lost interest in sex completely.

#### INTERPRETING THE BECK DEPRESSION INVENTORY

Now that you have completed the questionnaire, add up the score for each of the twenty-one questions by counting the number to the right of each question you marked. The highest possible total for the whole test would be sixty-three. This would mean you circled number three on all twenty-one questions. Since the lowest possible score for each question is zero, the lowest possible score for the test would be zero. This would mean you circles zero on each question. You can evaluate your depression according to the Table below.

Total Score \_\_\_\_\_ Levels of Depression

1-10	_____	These ups and downs are considered normal
11-16	_____	Mild mood disturbance
17-20	_____	Borderline clinical depression
21-30	_____	Moderate depression
31-40	_____	Severe depression
over 40	_____	Extreme depression