The Role of Social Anxiety in Adolescents' Social Media Use

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Abstract

Nowadays, the use of social media among adolescents is a common phenomenon. This may have positive and negative consequences. It is expected that people suffering from social anxiety may be especially vulnerable for some negative consequences, for example addiction to social media. Yet little is known about these associations. Therefore the current cross-sectional study (N = 415) focuses on the impact of social anxiety on the use of social media among adolescents between 15 and 18 years old. The use of social media is determined by (1) a self-report questionnaire determining the daily amount of time spent on social media, (2) the Social Media Addiction Questionnaire assessing the level of addiction to social media, and (3) the Social Media Appreciation Questionnaire assessing the level of appreciation towards social media. The level of social anxiety is detected by the use of the Liebowitz Social Anxiety Scale for Children and Adolescents. Results show that social anxiety is a significant predictor for the level of addiction to social media. The daily amount of time spent on social media, the appreciation of social media and even the addiction to social media are better explained by variables like gender, age, education level and school type than by the social anxiety variable. Consequently, it can be concluded that there is no direct relationship between social anxiety and the use of social media. Instead, these two variables are subject to a far more complex relationship, influenced by other factors like gender, age etcetera.

1 Introduction

In the last few years, many people, especially adolescents, started using social media or social networking sites. Today, 73 percent of the adolescents in the United States with access to the Internet are using social networking sites, compared to 55 percent in 2006 and 65 percent in 2008 (Lenhart, Purcell, Smith, & Zickuhr, 2010). Therefore, it seems to be that social media and social networking sites have become increasingly popular.

Using social media has several benefits, including enhanced communication with family and friends, opportunities for community engagement, collaboration and exchange of ideas, access to health information, development of cognitive abilities, and facilitating the exploration of identity (Tynes, 2007). However, using social media can have negative consequences as well, including sexting, cyber bullying, privacy violation, Internet addiction, stalking, threatening, depression, loneliness, sleep deprivation, and legal risks. All these aspects are dangerous since they can all affect the user's physical and psychological health (O'Keeffe & Clarke-Pearson, 2011).

Yet, little research has been performed on the associations between social media and the possible negative consequences it may have. One explanation for this is that social media are still fairly new. Another explanation is the lack of a clear definition of the concept social media in the literature. As a result, it is hard to compare outcomes of different studies on this topic. Most of the studies addressed the effects and associations of social networking in general. However, that is just only one part of social media. Actually, hereby only one part of the concept social media is addressed. The concept of social media is broader and refers to public forms of creating, sharing and exchanging information, without or with minimal intervention of an editorial office. Examples of social media include photo websites, social bookmarking, social networking, social news websites, weblogs, and video websites. In this study, this broad definition of the concept social media is used because of the little research towards the negative consequences on this topic.

Although recent studies found interesting results, the body of academic research on the negative consequences of using social media is limited. One of the studies performed is a study of Van Rooij and Schoenmakers (2013) on the (ab)use of Internet, game addiction, video addiction, and sex addiction as a consequence of the global growth of the use of Internet. They investigated the use of Internet and social media by Dutch adolescents between 12 and 15 years old. Girls reported more problems associated with the use of social media than boys did. Girls spent more time on Twitter, Instant Messenger and other social

networking activities, while boys spent more time on gaming and downloading. In the whole group of adolescents, 61 to 90 percent encountered problems associated with the use of social media, in particular in relation to the time they spent on it.

There are a few studies that focus in particular on the use of social networking and negative consequences. Rosen *et al*. (2013) found that having a higher number of Facebook friends is associated with more clinical symptoms of bipolar-mania, narcissism and histrionic personality disorder but fewer symptoms of dysthymia and schizoid personality disorder. Pantic *et al*. (2012) conducted a study on the association between social networking and depression among high school students. They found a significant correlation between depression and the time spent on social networking. This result was confirmed by the studies of Koc and Gulyagci (2013) and Becker, Alzahabi and Christopher (2013) on Turkish and American high school students. They found that social motives, depression, anxiety and insomnia are positively correlated with the use of Facebook. However, other studies showed that there is no relationship between depressive symptoms, global anxiety symptoms, and social anxiety symptoms and the amount of time spent on social networking activities (Feinstein, Bhatia, Hershenberg, & Davila, 2012; Jelenchick, Eickhoff, & Moreno, 2013). Grieve, Indian, Witteveen, Tolan and Marrington (2013) actually found that the use of Facebook may provide the opportunity to develop and maintain social connectedness in the online environment. They also found that Facebook connectedness is associated with lower depression and anxiety levels and more life satisfaction.

Besides the correlations between general disorders such as depression, anxiety, and personality on the one hand, and the use of social media on the other hand, also a more specific relationship between the use of social media and social anxiety is conceivable. In 2012, Pumper and Moreno found a correlation between moderate or high scores on social anxiety and a neutral or positive appreciation of Facebook. Among the participants who valued the use of Facebook negatively, none of them scored moderate or high on social anxiety. Hereby, a more specific relationship between the use of social media and social anxiety can be hypothesized; People suffering from social anxiety appreciate Facebook more positively.

Weidman *et al*. (2012) performed two different studies in socially anxious individuals. The first focused on whether those individuals used internet as a compensatory social medium. The results indeed showed a positive relation between socially anxious individuals and their use of internet for social purposes. They had greater feelings of comfort and self-disclosure for online social activities. The second study focused on whether this relationship

was associated with greater well-being. The results showed an association between social anxiety and lower quality of life and higher depression rates, in particular for the individuals frequently using online communication. The authors argue that using the Internet as an alternative for real life communication and social activities is not a good strategy, since it results in lower levels of well-being.

Indian and Grieve (2014) studied the increased value of social support derived from online social networks among socially anxious and non-socially anxious individuals. In the high social anxiety group, online social support was a significant predictor of subjective well-being. Offline social support did not significantly contribute to subjective well-being. In the group with low socially anxious individuals, online social support did not significantly explain more of the variance in subjective well-being than offline social support.

Furthermore, Campbell, Cummings and Hughes (2006) found and argue that online social activity is anonymous and, as a result, less frequently considered as threatening. In this way, socially anxious people can compensate for their lack of social activities in the real world. This line of reasoning is called the social compensation hypothesis. Online social activities offer the opportunity to practice social behavior and to enhance communication skills. Caplan (2007) also found evidence for the same hypothesis, namely that people with high levels of social anxiety use social media as a form of social compensation, since online they experience a greater sense of control on how they present themselves than in real life. He draws this conclusion based on the results of his study on the relationship between loneliness and the preference for online social communication. He states that this relationship has a spurious nature while social anxiety is the confounding variable.

The studies discussed above give evidence for a relation between social media and social anxiety. The current study aims to investigate this possible relationship between social anxiety on the one hand and use of social media on the other hand. In this study, adolescents will be compared in their way of using and appreciating social media. This is an important research topic, since many adolescents use social media, but little is known about the possible association with social anxiety. The limited body of academic inquiry on the relationship between social anxiety and the use of social media mainly focused on (young) adults, rather than on adolescents. Since it is known that adolescents use social media on a regular basis, this study focuses on this population segment. Moreover, social anxiety is a common mental disorder among adolescents with an estimated prevalence of five to fifteen percent (Heimberg *et al*., 2000; Lewinsohn *et al*., 1993). The most important characteristic of people suffering from social anxiety is that they have a marked and persistent anxiety for social situations or

for situations in which they have to perform. Furthermore, it is important that the feared situations are avoided or are endured with intense anxiety or distress (American Psychiatric Association, 2000). In this study, only symptoms of social anxiety are used to see what the influence of such symptoms is on social media use among adolescents. It is certainly not intended to categorize adolescents with or without a social anxiety disorder.

The research question of this study is: *What is the relationship between social anxiety and adolescents' social media use?* This relationship will be controlled for the following possible confounding variables: gender, age, education level, and type of school (Christian versus secular). This question is investigated by means of the following sub questions. (1) What is the role of social anxiety in the daily time spent on social media? (2) What is the role of social anxiety in the addiction to social media? (3) What is the role of social anxiety in the appreciation of social media? Also in the sub questions the possible confounding variables are taken into account. The aim of this is to see what the unique contribution of social anxiety is on the use of social media. Each of these three sub questions highlights a different aspect of the use of social media, namely the daily time spent on social media; addiction to social media; and appreciation of social media. In every question, social anxiety is used as the independent, predictive variable, while the several aspects of the use of social media are used as dependent variables.

It is hypothesized that adolescents with social anxiety spend more hours of their time on social media, are more addicted to social media, and have a more positive view on social media than adolescents without these symptoms (Pumper, & Moreno, 2012). Direct interactions and reactions of others often induce anxiety in people suffering from social anxiety. By using social media, socially anxious adolescents can avoid direct reactions of others and thereby reduce or prevent occurring anxiety.

2 Methods

2.1 Participants

For this cross-sectional study, 415 adolescents between 15 and 18 years old were recruited from three secondary schools in the Netherlands, namely the reformed Greydanus College in Zwolle (n = 152), the Gereformeerde Scholengemeenschap Randstad in Rotterdam (n = 181) and the Beatrix College in Tilburg (n = 82). The participants were purposely recruited from different school classes, with different education levels, with different grades, and from different age levels, in order to get a mixed research group. It was assumed that these adolescents had at least some knowledge about social media. It is taken into account that the respondents are derived from two different school types, namely a Christian and a secular one.

2.2 Procedure

The respondents were asked to fill out a questionnaire. For the schools in Rotterdam and Zwolle, a printed version was provided, while the respondents in Tilburg were asked to fill out an online version. Initially, the desired procedure was to let the subjects fill out the questionnaire in the classroom, since this would result in lower drop-out rates. For the school in Tilburg, however, this was not possible, because the online version had to be used, at the request of the school, and the subjects therefore had to fill out the questionnaire using a computer, for example at home. At the beginning of the questionnaire, an informed consent with a short explanation of the goals of the study was provided.

2.3 Materials

2.3.1. Demographic Data

The first part of the questionnaire consisted of demographic questions such as gender, education level and age. Four Dutch education levels were included, namely (1) VMBO GL (n = 18), (2) VMBO TL (n = 52), (3) HAVO (n = 125), and (4) VWO/Gymnasium (n = 220). Because of the low number of VMBO GL subjects, the variable Education Level has been recoded into three categories: (1) VMBO, (2) HAVO, and (3) VWO/Gymnasium.

2.3.2 Social Media

In the next part, the respondents were asked to indicate which forms of social media they use

out of a list with possible social media forms. It was also possible to mention additional forms of social media in case these were not included in the list.

2.3.3 Daily Time Spent to Social Media

In this study there was a self-rating question of the estimated daily time spent on social media with the following response options: (1) 0 – 30 minutes, (2) 30 – 60 minutes, (3) 60 – 90 minutes, (4) 90 –120 minutes, (5) 120 – 150 minutes, (6) 150 – 180 minutes, (7) 180 – 210 minutes, (8) 210 – 240 minutes, and (9) more than 240 minutes.

2.3.4 Social Media Addiction

To determine the level of social media addiction, the respondents were asked to fill out the Social Media Addiction questionnaire, this questionnaire can be seen in Appendix I. This questionnaire is based on the Compulsive Internet Use Scale (CIUS). The CIUS showed factorial stability across time and across different (sub)samples. The internal consistency is high ($\alpha \geq .89$), and high correlations ($r \geq .48$) with concurrent and criterion variables (RMSEA $\leq .08$, CFI $\geq .97$) demonstrate good validity (Meerkerk, Van Den Eijnden, Vermulst, & Garretsen, 2009). The questions on the use of Internet were transformed to questions related to the use of social media. The addiction score is the sum of 13 items on a five-point scale. This score is used as a continuum score.

2.3.5 Social Media Appreciation

To assess how adolescents appreciate social media the subjects had to fill out the Social Media Appreciation Questionnaire, developed for this study. For the full questionnaire see Appendix II. This questionnaire consists of seven propositions on a five-point scale. The sum of the seven propositions scores, gave the total appreciation score, which is a continuum score.

2.3.6 Social Anxiety

The respondent's levels of social anxiety were identified by the validated Liebowitz Social Anxiety Scale for Children and Adolescents (LSAS-CA). This instrument showed a high internal consistency ($\alpha \geq .90$) and a high test-retest reliability (intraclass $r \geq .89$). Children and adolescents with a social anxiety disorder had significantly higher LSAS-CA scores than children and adolescents with other anxiety disorders and healthy controls. These findings suggest that this questionnaire is a reliable and valid instrument for the assessment of social

anxiety symptoms (Masia-Warner, *et al.*, 2003). The total anxiety score consists of four different sub scores for social anxiety, namely (1) anxiety for social situations, (2) avoidance of social situations, (3) anxiety of performance, and (4) avoidance of performance. The total score is composed of an anxiety and an avoidance part. The LSAS-CA is used as continuum variable.

2.4 Statistical Analysis

The relationship between social anxiety on the one hand and daily time spent on social media, addiction and appreciation on the other hand is investigated by three multiple regression analyses, for the prediction of daily time spent to social media; addiction to social media; and appreciation of social media. Pearson correlations were used as a check of multicollinearity to determine the relationship between these variables and social anxiety. There should be no multicollinearity, which means that the correlation between the independent variables has to be less than .90 (Pallant, 2013). The influence of social anxiety on the variables daily time spent to social media, addiction and appreciation is also controlled for the possible confounding variables gender, age, education level and school type (secular versus Christian schools). In a multiple regression analysis the independent variables have to be of ratio/interval measurement level. The confounding variable age is already of ratio measurement level. The other three categorical confounding variables have to be recoded into dummy variables, however, school type and gender already are dummy variables. Education level is recoded into two new variables, with VWO as baseline group, because this education level represents the majority of subjects, so the other education levels are compared against the majority of subjects (Field, 2009). The aim was to predict addiction, appreciation and daily time spent independently out of social anxiety and the confounding variables to see what was the influence of social anxiety on the dependent variable. Three hierarchical linear regression models were created to predict addiction, appreciation and daily time spent. In block 1 these dependent variables were predicted out of gender, education level, age and school type in, and in block 2 out of social anxiety. This resulted into two models, one without social anxiety and one with social anxiety as predictor. In the statistics in a linear regression analysis in SPSS the option 'R squared change' is ticked. Consequently, it was possible to determine the unique contribution of social anxiety on the dependent variables.

3 Results

3.1 Demographic data

Table 1 provides an overview of the background variables gender, age, education level and school type in this study.

Table 1

Number of Subjects and % of Total Subjects for Gender, Age, Education Level, Type of School and Type of Used Social Media.

	Presence	*n*	% of *N*
Gender	Male	187	45.1
	Female	228	54.9
Age	15	142	35.0
	16	160	39.4
	17	88	21.7
	18	16	3.9
Education Level	VMBO	70	16.8
	HAVO	125	30.1
	VWO/Gymnasium	220	53.0
Type of School	Secular	82	19.8
	Christian	333	80.2

Among the 415 subjects of this study, only four subjects used no social media at all.

3.2 Social Anxiety and Daily Time Spent to Social Media

The mean daily time spent on social media among the subjects was about 142 minutes ($SD \approx$ 52 minutes). The social anxiety scores ($M = 32.25$, $SD = 19.73$, $\alpha = .94$) were correlated with the daily time spent on social media. There existed no relationship between these factors. The sub scores, the anxiety and avoidance scores, and the total anxiety score were fluctuating randomly between the different time categories. No multicollinearity was found in this regression analysis. The regression analysis showed that the confounding variables gender ($\beta = .22$, $p < .001$), education level ($\beta = .26$, $p < .001$ and $\beta = .19$, $p < .001$) and type of school ($\beta = .19$, $p < .001$) were significant in the prediction of the daily time spent on social media. In the model with social anxiety ($\beta = -.05$, $p = .30$), 17.9% of the variance is explained (F $(6,385) = 13.96$, $p < .001$), in the model without social anxiety 17.6% of variance is explained (F $(5,386) = 16.54$, $p < .001$). Consequently, social anxiety has not proven to be a significant predictor (F *Change* $(6,385) = 1.08$, $p = .30$) of the daily time spent on social media and, thus,

led to only 0.3% extra explained variance of the daily time spent on social media. These results were summarized in table 2.

Table 2

Comparison Between a Regression Model With and Without Social Anxiety in the Prediction of the Daily Time Spent on Social Media.

	Model With Social Anxiety			Model Without Social Anxiety	
	β	*p*		β	*p*
Gender	.23	< .001	Gender	.22	< .001
Age	-.04	.42	Age	-.04	.37
VWO vs. VMBO	.25	< .001	VWO vs. VMBO	.26	< .001
VWO vs. HAVO	.20	< .001	VWO vs. HAVO	.19	< .001
Type of School	.18	< .001	Type of School	.19	< .001
Social Anxiety	-.05	.30			
Model	F (6,385) = 13.96, p < .001		Model	F (5,386) = 16.54, p < .001	
Explained Variance (R²)	17.9%		Explained Variance (R²)	17.6%	
R² Change	0.3%				

Gender was of significant influence because girls ($M \approx 158$ minutes) reported that they spent more time on social media than boys ($M \approx 124$ minutes, t (406) = -4.38, $p < .001$). Education level was significant (F (2,405) = 23.86, $p < .001$), as can be seen by VMBO subjects ($M \approx 190$ minutes) who spent more time on social media than subjects of HAVO ($M \approx 156$ minutes) and HAVO subjects spent more time on social media than VWO/Gymnasium subjects ($M \approx 120$ minutes). Type of school was significant in the prediction because subjects of the public school spent less time ($M \approx 111$ minutes) on social media than subjects ($M \approx 151$ minutes) of Christian schools (t (406) -3.96, $p < .001$).

3.3 Social Anxiety and Social Media Addiction

Two regression models were made, one without social anxiety as predictor and one with social anxiety ($M = 30.51$, $SD = 9.08$, $\alpha = .89$) as predictor of addiction to social media. This was allowed because there was no multicollinearity. The first model (F (5,384) = 16.51, $p < .001$) showed a r =.42 = .18 compared to r =.43 = .19 of the second model (F (6,383) = 14.81, $p < .001$). Gender (β = .38, $p < .001$) and VWO vs. VMBO (β =.16, $p < .01$) were significant predictors of addiction to social media in the regression analysis, where no multicollinearity was found. The addition of social anxiety (β = .11, $p < .05$) as predictor of

social media addiction was also significant (*F Change* (6,383) = 5.39, *p* < .05). These results can be found in table 3.

Table 3

Comparison Between a Regression Model With and Without Social Anxiety in the Prediction of Addiction to Social Media.

	Model With Social Anxiety			**Model Without Social Anxiety**	
	β	***p***		**β**	***p***
Gender	.35	< .001	**Gender**	.38	< .001
Age	.03	.49	**Age**	.04	.38
VWO vs. VMBO	.16	< .01	**VWO vs. VMBO**	.16	< .01
VWO vs. HAVO	.04	.40	**VWO vs. HAVO**	.05	.36
Type of School	.10	< .05	**Type of School**	.08	.10
Social Anxiety	.11	< .05			
Model	*F* (6,383) = 14.81, p < .001		**Model**	*F* (5,384) = 16.51, p < .001	
Explained Variance (R²)	18.8%		**Explained Variance (R²)**	17.7%	
R² Change	1.1%				

Gender and education level predicted addiction to social media better than social anxiety did. The addition of social anxiety as independent variable resulted in only 1% extra explained variance. Gender was of significant influence because the mean addiction score of girls was 33.72 compared to a mean addiction score of 26.55 for boys (*t* (403) -8.58, *p* < .001). Education level was significant because of the relatively high addiction scores among VMBO subjects, which is showed in table 4 (*F* (2,402) = 7.21, *p* < .01).

Table 4

Mean Addiction Scores for different Education Levels

Education Level	**Mean Addiction Score**	***n***
VMBO	33.99	69
HAVO	30.67	125
VWO/Gymnasium	29.28	211

The school type variable was a significant predictor in the model with social anxiety (β =.10, *p* < .05), while it was an insignificant predictor (β =.08, *p* = .10) in the model without social anxiety. This could be explained by the fact that the level of addiction is slightly lower at secular schools (*M* = 29.33) in contrast to Christian schools (*M* = 30.81). This difference is not significant (*t* (403) -1.32, *p* = .19). However, in the model with social anxiety as a predictor, it delivers a significant contribution to the prediction of the level of addiction to social media.

3.4 Social Anxiety and Social Media Appreciation

A regression analysis showed two models in which the appreciation (M = 16.20, SD = 4.18, α = .71) of social media is predicted. There existed no multicollinearity in the regression analysis. In the first model (F (5, 389) 4.64, p < .001), without social media as predictor, the possible confounding variables gender (β = -.14, p < .01) and age (β = .17, p < .01) were significant predictors of appreciation. In the second model (F (6, 388) 4.24, p < .001), with social anxiety as predictor, was social anxiety an insignificant predictor (β = .08, p = .14). In the model without social anxiety as predictor 5.6% of the variance is explained compared to 6.2% in the model with social anxiety as predictor. Social anxiety was not significant in the prediction of the level of appreciation of social media and led to only 0.6% extra explained variance (F $Change$ (6,388) = 2.20, p = .14), which is showed in table 5.

Table 5

Comparison Between a Regression Model With and Without Social Anxiety in the Prediction of Appreciation of Social Media.

	Model With Social Anxiety			Model Without Social Anxiety	
	β	*p*		β	*p*
Gender	-.16	< .01	**Gender**	-.14	< .01
Age	.16	< .01	**Age**	.17	< .01
VWO vs. VMBO	-.03	.55	**VWO vs. VMBO**	-.04	.53
VWO vs. HAVO	-.03	.56	**VWO vs. HAVO**	-.03	.60
Type of School	.01	.90	**Type of School**	-.01	.89
Social Anxiety	.08	.14			
Model	F (6,388) 4.24, p < .001		**Model**	F (5,389) 4.64, p < .001	
Explained Variance (R²)	6.2%		**Explained Variance (R²)**	5.6%	
R² Change	.06%				

Gender was significant in the prediction of appreciation because boys appreciated (M = 16.87) social media more than girls (M = 15.64). This difference was significant (t (409) 3.00, p < .01). Age was significant in the prediction of appreciation of social media because the 17 and 18 year old subjects had higher appreciation scores than the 16 year old subjects, the 16 year old subjects had higher scores than the 15 year subjects. The difference between the different age categories was significant (F (2, 408) 7.03, p < .01).

4 Discussion

4.1 General Discussion

In the current study, research has been done on the question if a relationship between social anxiety and the use of social media among adolescents exists. The results of this study did not implicate a clear correlation between social anxiety on the one hand and the use of social media on the other hand. The social anxiety variable was a significant predictor of the addiction to social media. However, gender and educational level were even better predictors for the level of addiction to social media. Social anxiety was no significant predicting variable for daily time spent on social media. Variables like gender, educational level, and school type were clearly better predictors for the daily time spent on social media. The same applies to the appreciation of social media. Social anxiety was also here no significant predicting variable, gender and age have proven to be significant predictors of the extent of appreciation of social media.

These results suggest that there is no direct convincing relationship between social anxiety and the use of social media. Rather, other factors influence this relationship. Alternative explanations have to be identified to determine how and to what extent the two variables involved are related to each other. It needs to be emphasized that there are also studies, like the current study, that do not identify a clear relationship between social anxiety and the use of social media. For example, Stevens and Morris (2007) found no relationship between social anxiety and the use of social networking sites. People with higher levels of social anxiety did not tend to use the Internet for networking more frequently than people without social anxiety. In this quantitative study ($N = 666$), the sample consisted of slightly older respondents than in my study, namely between 18 and 25 years old. Madell and Muncer (2006) found similar results. They did their research ($N = 362$) on a group of adolescents with an average age of 18.6 years. Also Scealy, Phillips and Stevenson (2002) have not found a significant relationship between the use of social media and social anxiety in their study ($N = 177$) on a group of 18 to 79 year old respondents. The results of these studies correspond with the outcomes of the current study. However, because of the different outcomes of the studies it is hard to state that there is no direct relationship between social anxiety and the use of social media. After all, there are also studies confirming this relationship, while using roughly the same hypothesis as used in this study.

Another point of discussion is raised by different outcomes of studies examining the relationship between social media and social anxiety. For example, according to the studies of

Campbell, Cummings, and Hughes (2006) and Caplan (2007), there seems to be a relationship between social anxiety and the use of social media. However, in the study of Campbell, Cummings and Hughes ($N = 215$, $M = 28.7$) the relationship between the use of social media and social anxiety deserves nuance, since the scholars have not found a correlation between daily time spent on the Internet and social anxiety. Furthermore, they conclude that those people that use the Internet for online social activity believe this gives them a psychological advantage in real life social communication. These people also tend to believe that people that use the Internet frequently are lonely and addicted.

Nevertheless, the fact that the current study and other studies find opposite results in the relationship between social anxiety and social media use, raises the question how this is possible. Definitions of the concepts involved could be a major explanation. And even when a proper definition is found, it remains difficult to map the use of social media in a proper way as well. And even when there would be consensus about the definition it would be difficult to properly assess the use of social media. It could be questioned whether it is conclusive to measure the use of social media only by taking into account the daily time spent on social media, the level of addiction to social media and the level of appreciation towards social media. Especially the daily time spent on social media is difficult to assess. Presumably, the two variables 'daily time spent on social media' and 'the level of addiction to social media' are closely correlated, one could wonder what is the added value of the variable 'daily time spent on social media'. The difference in outcome between the current study and other studies, where a relationship is found between social anxiety and social media use, seems to mainly be due to different measured variables and hypotheses. For example, Campbell, Cummings and Hughes (2006) and Caplan (2007) used the 'social compensation hypothesis' in their study, they toke only into account if people with social anxiety use social media as compensation to be socially active. The current study made use of other (dependent) variables, whereby social compensation was hardly a factor.

In addition, it would be useful to take into account the study of Tian (2013). He not only investigated the social compensation hypothesis, but also investigated the rich-get-richer hypothesis in which actually the opposite is proposed: Internet primarily benefits extrovert individuals with strong social skills, as they use Internet for social reasons more and more. Tian found that there is evidence for the social compensation hypothesis as well as the rich-get-richer hypothesis. Individuals with high levels of social anxiety made less new friends and communicated with fewer existing friends via blogs on Internet. They experienced lower relationship quality with those existing friends, but experienced higher relationship quality

with new friends made through blogs. Furthermore, Tian found an association between the degree of social anxiety and the motivation to make new friends via blogs on the one hand and disclosing intimate information on their blogs on the other hand. Both of them were associated with higher quality and quantity of new friends (Tian, 2013). An important element of the study of Tian is that different levels of social anxiety were distinguished. Subsequently, Tian investigated whether the level of social anxiety influenced the way people communicated online. Moreover, it is interesting that he distinguished between existing friends and new friends. It is conceivable that online contact with existing friends generates more anxiety than online contact with new friends. When socially anxious people communicate with new friends, they need less prior knowledge and can experience higher levels of freedom, since the contact is online. This seems to be an interesting nuance within the research on the relationship between social anxiety and the use of social media. Tian's study shows that it can be useful to conceptualize the use of social media in specific terms. This approach has certain advantages above the current study approach, since the current study used variables that were hard to operationalize, for example appreciation and a self-rating questionnaire on the daily time spent on social media. In the study of Tian the focus was on certain aspects of social media. With this approach it was possible to identify a clearer relationship between social anxiety and the use of social media.

In the discussion on the relationship between social anxiety and the use of social media, it could be useful to comment on the hypothesis used in the current study. In the current study, it is hypothesized that social anxiety leads to higher levels of social media use, higher levels of addiction and higher levels of appreciation of social media. Actually, there are also studies that tested the exactly opposite hypothesis: social anxiety would lead to lower levels of social media use and appreciation of social media due to the decreased need for social intercourse. The current study has paid minor attention to this argument, while there are some studies available supporting this line of reasoning. For example, Valkenburg and Peter (2007) show in their study (N=794), that people with social anxiety tend to use online communication tools less frequently than people without social anxiety. The researchers regarded these results as evidence for the rich-get-richer hypothesis. However, Valkenburg and Peter also found evidence for the social compensation hypothesis. They show that the socially anxious children in their sample regarded the Internet as more valuable to share intimate information than children without social anxiety. This perception means that social anxious children still use social communication. They support this claim by arguing that online communication and the robustness of social acquaintance increase over the years. They

found a curve linear relationship between age and the level of appreciation towards Internet as a mean of achieving social goals. The research sample differed from the current study: the scholars used ten to sixteen year old children in their study. Compared with the current study, children were younger and involved a wider range. Although Valkenburg and Peter start with the hypothesis that social anxiety leads to less instead of more frequent use of social media among adolescents, they still find evidence for the social compensation hypothesis. As a result, the researchers undermine their evidence for the hypothesis that social anxiety leads to lower levels of appreciation towards or less frequent use of social media. This is in line with the studies on and evidence for the social compensation hypothesis, as discussed above. It, thus, seems that the hypothesis arguing that social anxiety leads to less frequent use of and lower levels of appreciation towards social media is less convincing than the hypothesis arguing the opposite.

In sum, there seems to be quite a lot of evidence for a relationship between social anxiety and the use of social media. The use of clear definitions and operationalized variables plays an important role in investigating this relationship. The social compensation hypothesis can be used as an explanation.

4.2 Limitations of this Study

This study has a number of limitations. First of all, there are some demographic limitations regarding respondents which affect the generalizability of this study. There are clearly more students from Christian schools than students from public ones. Although it was not expected that the results of this study would be affected by school type, it has proven to be a significant predictor of the daily time spent on social media. In the model with social anxiety as a predictor of the level of addiction to social media, it seemed school type was also a significant variable. However, due to the fact that there were clearly more respondents from Christian schools than from secular ones, these conclusions deserve some nuance. Also, the number of seventeen- and eighteen-year-olds is quite low, when compared to the other age levels. Furthermore, while the students from the VMBO level are underrepresented, students from the VWO/gymnasium level are overrepresented in the sample. These limitations raise concerns regarding the generalization of this study's conclusions.

A major limitation in measuring the daily time spent on social media is that it involves a self-report questionnaire and, as a result, it is hard to determine this data's reliability. Since currently more and more adolescents become familiar with the use of tablets and smartphones, it is easy for them to regularly use social media for only a short time, for

example when they check their e-mail or send short WhatsApp messages. When respondents perform such behavior, it is difficult for them to determine the exact amount of time they spent on social media on a daily basis.

A disadvantage of the social media appreciation variable is that it involves a questionnaire which is designed by the researcher. Nevertheless, the internal consistence is reasonably good. A disadvantage of the social media addiction variable is that it involves a questionnaire on addiction to the use of Internet. This questionnaire is transformed to a set of questions on addiction to the use of social media. Although addiction to the use of Internet and addiction to the use of social media cannot be regarded as identical, the internal consistence is good. Another important drawback regarding the social media addiction variable is that it is hard to determine the nature of the addiction. Addiction presumably refers to the amount of time spent on something and the level of appreciation towards it. It can be assumed that the level of addiction is positively correlated with the time spent and the level of appreciation. This assumption leads to the question whether separate questionnaires on appreciation of social media and self-rating questions on the daily time spent on social media have significant added value. This hesitancy is strengthened by the fact that there seems to be no direct relationship between appreciation and social anxiety, and between the daily time spent on social media and social anxiety.

4.3 Recommendations for Future Research

From my inquiry and those of others, it often seems that there exists no univocal relationship between the use of social media and social anxiety. It could be the case that the relationship between the two variables is influenced by another variable. It has been proved that social anxiety is not an intrinsic predictor for the use of social media. This relationship is far more complex than a simple causal relation between the two variables. For example variables like gender, education level, age, and school type have to be considered. These variables could be important predictors for social anxiety or the use of social media. Furthermore, it is recommended to distinguish between levels of social anxiety. Because there is evidence for both the social compensation hypothesis and the rich-get-richer hypothesis. In a study on online contact, Tian (2013) distinguished between contact with friends and strangers. This is a good example of how the relationship between social anxiety and the use of social media could be influenced. Future research on this topic has to consider the complex relationship between social anxiety and the use of social media, and possible variables that can influence one of them or both.

As stated in the introduction regarding social media as one concept is difficult. To prevent conceptualization problems in future research, it is recommended to investigate the relationship between social anxiety and a specific kind of social medium. In any case, it has to be considered how the use of social media can be measured and how these data can be used in analyses to come to the right conclusions. It seems wise to conceptualize the use of social media in specific terms.

Furthermore, the social compensation hypothesis and the rich-get-richer hypothesis have to be further investigated in future research. The literature on these two arguments often suggests that they predict contrasting effects, leading to the conclusion that the two hypotheses are mutually exclusive. However, future research should not focus on the question which of them is right, but should focus on the effect of each of them independently. For example, regarding the social compensation hypothesis, it could be that people with lower levels of social anxiety indeed could use social media by means of compensation, while people with higher levels of social anxiety are also too anxious online to be socially active. However, the confirmation of the latter effect does not confirm the rich-get-richer hypothesis by definition, since it cannot be rejected that the use of social media among socially anxious people exists. For this reason, the co-existence of the social compensation hypothesis and the rich-get-richer hypothesis should be a proper starting point to investigate both.

Finally, this study mainly focused on the influence of social anxiety on the use of social media. The opposite causality, arguing that the use of social media could result in higher levels of social anxiety, has received little attention. There are studies available on this latter argument. Some of them show that the use of Internet is associated with lower levels of wellbeing, like depression and loneliness (Kraut *et al*., 1998), while other studies show the opposite (Gross, Juvonen, & Gable, 2002; Kraut *et al*., 2002). Becker, Alzahabi and Hopwood (2013) focus solely on social anxiety as a result of the use of social media. They show that media multitasking leads to higher levels of depression and higher levels of social anxiety. The review of these studies implicate that both directions of the causality between social anxiety and the use of social media should be considered. Precisely because of the vagueness around the relationship between social anxiety and the use of social media, it deserves recommendation to investigate both directions of the association.

The recommendations mentioned above support further and better research for the relationship between social anxiety and the use of social media. In the current study evidence was found for the relation between social anxiety and addiction to social media. Replication

of the current study in the future is recommended. Thereby, it would be important to focus on clearly defining (aspects) of social media and social anxiety

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Appendix I

Social Media Addiction Questionnaire

Omcirkel per vraag een cijfer. 1 = nooit, 2 = zelden, 3 = soms, 4 = vaak en 5 = heel vaak.

	Nooit	Zelden	Soms	Vaak	Heel vaak
Hoe vaak vind je het moeilijk om te stoppen met sociale media?	1	2	3	4	5
Hoe vaak blijf je doorgaan met sociale media terwijl je eigenlijk wilde stoppen?	1	2	3	4	5
Hoe vaak zeggen anderen (vrienden, ouders of partner) dat je minder gebruik moet maken van sociale media?	1	2	3	4	5
Hoe vaak gebruik je liever sociale media in plaats van tijd te besteden aan anderen (vrienden, ouders of partner) ?	1	2	3	4	5
Hoe vaak zorgt je gebruik van sociale media voor slaaptekort?	1	2	3	4	5
Hoe vaak denk je aan sociale media, ook al ben je niet online?	1	2	3	4	5
Hoe vaak kijk je vooruit naar je volgende gebruik van sociale media?	1	2	3	4	5
Hoe vaak denk je dat je minder gebruik moet maken van sociale media?	1	2	3	4	5
Hoe vaak heb je geprobeerd, zonder succes, minder tijd te besteden aan sociale media?	1	2	3	4	5
Hoe vaak doe jij je (huis)werk extra snel om zo eerder gebruik te maken van sociale media?	1	2	3	4	5
Hoe vaak verwaarloos jij je dagelijkse taken (werk, school of gezinsleven) omdat je liever gebruik maakt van sociale media?	1	2	3	4	5
Hoe vaak gebruik je sociale media wanneer jij je somber voelt?	1	2	3	4	5
Hoe vaak gebruik je sociale media om te ontsnappen aan je somberheid of om een negatieve bui te verlichten?	1	2	3	4	5

Appendix II

Social Media Appreciation Questionnaire

Ik vind Sociale Media						
Gevaarlijk	1	2	3	4	5	Ongevaarlijk
Onhandig	1	2	3	4	5	Handig
Waardeloos	1	2	3	4	5	Waardevol
Onnodig	1	2	3	4	5	Nodig
Misbaar	1	2	3	4	5	Onmisbaar
Niet Leuk	1	2	3	4	5	Leuk
Verslavend	1	2	3	4	5	Niet Verslavend