

**Social media use, loneliness, and academic achievement:
A correlational study with urban high school students**

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Abstract

This study explored the association between social media use, loneliness, and academic achievement in high school students and identified the demographic characteristics associated with these three elements. This study also aimed to identify the percentage of variance in loneliness accounted for by social media use and GPA. Participants were 345 urban high school students from Michigan. A series of *t*-tests, ANOVAs, and correlational analyses were performed. Gender differences were found for loneliness and the frequency of social media use. Race and grade level differences were found for GPA. Data yielded a weak negative correlation between loneliness and GPA. GPA accounts for about 2% of the variance in loneliness. Practical implications and recommendations for future research are discussed.

Keywords: Academic achievement, High school students, Loneliness, Social media use

Social networking, which may include photos, videos, and text messages, continues to grow as a method of communication among high school students. According to data gathered by Pew Research Center's Internet and American Life Project, 87% of teens and young adults with online access have social networking accounts, which is a significant increase from prior years (Duggan, Ellison, Lampe, Lenhart, & Madden, 2014); of those social networking accounts, Facebook is the most used and the most profound database of social information in the history of the world (Dockterman, 2014; Duggan et al., 2014; Hoover's Inc., 2012; Krasnova, Wenninger, Widjaja, & Buxmann, 2013).

With constant connection available through mobile devices, technology-mediated communication is seemingly never more than a click away; however, despite increased methods of connection and communication, between 15% and 30% of the general population experiences loneliness as a chronic state (Hawkley & Cacioppo, 2010). When considering the experience of

loneliness through the life span, adolescence seems to be the period in which loneliness peaks, with 80% of adolescents having experienced loneliness at some level (Hawkley & Cacioppo, 2010; Sippola & Bukowski, 1999). This higher number may be due to the elevated expectations regarding intimacy and loyalty that adolescents have toward their friends. Those for whom loneliness persists throughout adolescence may be at higher risk for low academic achievement (Dobson, Campbell, & Dobson, 1987).

Despite the demand for academic achievement and the pervasiveness of social media use and loneliness among teens, studies exploring the association between academic achievement and loneliness as well as social media use and loneliness have only found mixed results (Amichai-Hamburger & Ben-Artzi, 2003; Bonetti, Campbell, & Gilmore, 2010; Newsom et al., 2013). Studies exploring the connection among these three elements are rarely found. This study was designed to explore the relationships between social media use, academic achievement, and loneliness among high school students.

Background

Loneliness and Internet Use

Loneliness can be described as the distressing emotional experience that emerges from unfulfilled needs for social connection (Cacioppo & Patrick, 2008; Margalit, 2010). In this sense, loneliness differs from social isolation. Lonely people may spend many hours with friendly coworkers or family members and still feel unsatisfied with the quality of these connections (Cacioppo & Patrick, 2008; Hawkley, Burleson, Bernston, & Cacioppo, 2003). Loneliness has emotional, cognitive, and behavioral consequences that can affect a person's ability to evaluate their environment and social interactions. Individuals who feel lonely tend to develop hypersensitivity to negative social information, to rate their social interactions more negatively, and to engage in more defensive behaviors (Cacioppo & Hawkley, 2009; Cacioppo, Hawkley, et al., 2006).

Those who feel lonely also tend to spend more time online. A set of three studies draws attention to interesting aspects of the correlation between loneliness and Internet use. In a study with 277 undergraduates from the United States, Morahan-Martin and Schumacher (2003) found a significant difference between the lonely and the non-lonely groups in the average number of hours spent online per week. Those with a higher score in loneliness spent more hours per week online than did the other group (Morahan-Martin & Schumacher, 2003). This finding is supported by Odaci and Kalkan (2010). Their research project, which included 493 students, found that those with a high level of loneliness were more likely to report problematic Internet use, which was defined as five or more hours a day spent online (Odaci & Kalkan, 2010).

Focusing on Internet use for entertainment purposes, Whitty and McLaughlin (2007) conducted a study with 150 undergraduate students from a university in Ireland. This study revealed that loneliness is a significant predictor of Internet use for computer-based entertainment and information about the entertainment world (Whitty & McLaughlin, 2007).

These studies on loneliness and Internet use pointed to the recurrent argument about use of the Internet as a cause of loneliness and loneliness as a cause of Internet use; however, the methodology of these studies did not provide conclusive evidence about cause and effect. Nonetheless, each of the studies confirmed that people with higher levels of loneliness are more likely to engage in problematic Internet use, which may ultimately be a source of health issues based on a sedentary lifestyle and a higher disconnection from people in the real world.

Loneliness and Social Media

Research regarding loneliness and the use of social media has yielded mixed results. In an early study, Amichai-Hamburger and Ben-Artzi (2003) found no statistically significant relationship between loneliness and the social use of the Internet. In more recent studies, Jelenchick, Eickhoff, and Moreno (2013) discovered no link between the use of social networking and depression in adolescents and young adults ($n = 190$), while some researchers conclude that posting on social media websites, like Facebook, helps people to feel less lonely (Deters & Mehl, 2013). Conversely, some researchers posit that posting on such websites increases the chances of being ignored and decreases the perceptions of belonging (Tobin, Vanman, Varreynne, & Saeri, 2014).

Other studies have highlighted the positive effects of computer-assisted communication on psychological well-being. In a review of ethnographic research, Turkle (1995) concluded that the Internet offers a platform for social interaction that can increase the psychological well-being of isolated people. With the pervasiveness of social media, more recent studies conducted with first year college students found that using Facebook reduced feelings of loneliness (Lou, 2010), and increased social capital (Steinfeld, Ellison, & Lampe, 2008). Additionally, Bonetti, Campbell and Gilmore (2010) found that adolescents who self-identified as lonely expressed a preference for online communication for social interaction to make friends. Research with Spanish adolescents aged 12-17 ($n = 344$) also highlighted the positive effect of social media to increase feelings of well-being and decrease loneliness (Apaolaza, Hartmann, Medina, Barrutia, & Echebarria, 2013). Similarly, in research conducted with college students ($n = 265$) Lee, Noh, and Koo (2013) found that social media could provide a supportive network that reduced feelings of loneliness and increased self-reported feelings of well-being.

Recent longitudinal research with adolescents ($n = 256$) suggests that, over time, the perceptions of loneliness are often determined by how the adolescents use Facebook (Teppers, Luyckx, Klimstra, & Goossens, 2014). For example, if adolescents utilized Facebook to make new friends, then feelings of loneliness were ameliorated, but if Facebook was used to compensate for a lack of social skills, then the feeling of loneliness increased over time (Teppers et al., 2014). This finding may help to explain results by Kross et al. (2013), who concluded that, although social networking may fulfill the need for social connection, over time, some young adults ($n = 82$) who used Facebook reported a subjective decline in the feeling of well-being. This study also showed that the more lonely people feel, the more they tend to use Facebook over time (Kross et al., 2013).

These mixed results regarding loneliness and the use of social media call for more investigation into the relationship between these two variables and the potential impact on teenagers' development and academic achievement.

Loneliness, Social Media Use and Academic Achievement

While the association between loneliness and social media use has yet to be clarified, the impact of each of them on academic achievement also remains unclear. Regarding the association between loneliness and academic achievement, Newsom et al. (2013) conducted an integrative review of 36 quantitative studies on loneliness in school-age children and found mixed results regarding the association between loneliness and academic achievement. Mixed results were also found in other age groups. For example, a study with 640 Latino high school students did not find a significant correlation between loneliness and academic performance, as measured by GPA (Benner, 2011), while an investigation with 163 high school juniors yielded a

significant, strong negative correlation between loneliness and GPA (Dobson, Campbell, & Dobson, 1987). Such a situation asks for more studies to shed light on the impact of loneliness on the academic achievement of healthy individuals, especially among adolescents, who comprise the age group that most experiences loneliness.

The association between social media use and academic achievement also needs more investigation. Most of the research around the use of social media and academic achievement, which has been primarily conducted with college students, has demonstrated a negative relationship between time spent with social media and academic achievement (Karpinski & Duberstein, 2009; Karpinski, Kirschner, Ozer, Mellott, & Ochwo, 2013; Kirschner & Karpinski, 2010; Paul, Baker, & Cochran, 2012; Vanden Boogart, 2006). A recent study of first year college students corroborated these results by documenting a weak association between Facebook usage and self-perceived lower academic performance (Wohn & LaRose, 2014). Fewer studies have been focused on high school or middle school students regarding social media and academic achievement; however, the limited findings have shown a similar negative relationship. A study of African American and Hispanic middle school and high school students ($n = 314$) suggested a statistically significant negative relationship between math grades and the use of Facebook (Lee, 2014), and in a survey of middle-school students ($n = 268$), roughly a third of the students reported falling behind in school work or missing sleep because of social media (Espinoza & Juvonen, 2011).

The Present Study

Given the mixed results of research studies focused on academic achievement, loneliness, and social media use, the purpose of this research was to explore the relationship between academic achievement as measured by GPA, loneliness, and social media use of high school students. The demographic characteristics of the study participants were also compared to see if there were differences based on race, grade level, or gender in terms of loneliness, GPA, and social media use. An additional goal of this study was the identification of the percentage of variance in loneliness that may be accounted for by social media use and high school students' GPAs. To achieve these goals the following research questions were addressed: (1) Which demographic characteristics are associated with loneliness, social media use, and GPA? (2) What is the relationship among GPA, loneliness, and social media use among high school students? (3) What percentage of the variance in loneliness can be accounted for by social media use, and GPA?

Theoretical Framework

The theoretical framework that informs this study is based on the social cognitive theory developed by Bandura (1986). One of the central features of this theory is self-regulation, which can be defined as the "ability to exert control over one's own inner states, processes and responses" (Baumeister, Heatherton, & Tice, 1994, p. 6). Self-regulation is also one of the structural elements of loneliness. According to Cacioppo and Patrick (2008), individuals who experience higher levels of loneliness become unable to self-regulate, leading to distorted cognitions that impact their ability to evaluate social situations, others, and themselves. As Bandura suggested, thoughts can regulate actions, which ultimately will exert some influence on thought patterns and emotional responses. The theory of self-regulation is also applicable to academic achievement, and the overuse of the Internet, including social media. Research has found that individuals with deficient self-regulation are unable to properly assess and control

their Internet use, which may lead to problems in their relationships and academic performance (Caplan, 2010; LaRose, Lin, & Eastin, 2003). The importance of self-regulation is also true for academic achievement. Students who are able to self-regulate their motivation and learning strategies, for example, also are more likely to achieve their academic goals (Nota, Soresi, & Zimmerman, 2004; Zimmerman, 1990). Self-regulation, one of the central features of the social cognitive theory, provides the theoretical connection between the main variables of this study.

Method

Participants

Participants were part of a convenience sample of 345 high school students (50.6% women, 49.4% men) attending three public schools in an urban area of Michigan. A total of 36.6% of the participants were African Americans, 30.5% Latinos, 20.9% mixed race, 10.5% Caucasian, and 1.4% Asians. As for grade level, 39.1% were 9th graders, 40.3% 10th graders, 18.8% 11th graders, and 1.8% were 12th graders.

Measures

In addition to demographic questions – gender, race, and grade level – participants answered the Revised UCLA Loneliness Scale (Russell, Peplau, & Cutrona, 1980), which has good internal reliability with a Cronbach alpha of .85 for this study. The survey instrument also queried students on their GPA and how many times a day they checked social media. To answer the research questions, a statistical analysis of the data was completed through analysis of frequency, analyses of variance (ANOVA), *t*-tests, and the Pearson Product-Moment Correlation.

Procedures

Participants were contacted twice in their schools during instructional time. In the first contact they were given a parental consent form to take home. Students who received parental consent and volunteered to participate then read and signed the student consent before completing the questionnaire.

Results

Demographic Characteristics

A series of independent sample *t*-tests and analysis of variance (ANOVA) were performed to identify the demographic characteristics associated with loneliness, social media use, and GPA. These tests used quasi-quantitative variables that were derived from the original ordinal categorical variables social media use and GPA.

Independent Samples *t*-tests. The series of *t*-tests investigated mean differences for each of the dependent variables between the two independent gender groups of females vs. males. Significant mean differences were found for loneliness and social media use, both indicating that the female participants had significantly higher mean scores than the males. Significant findings were not noted for GPA. Table 1 presents the results for the series of *t*-tests.

Analysis of Variance (ANOVA). A series of analyses of variance tests (ANOVA) were performed, two sets for each of the dependent variables of loneliness, social media use, and

GPA. The first set involved the independent grouping variable of race, and the second set included the grouping variable of grade level.

Grade Levels. The first series of ANOVA analyses included the independent variable of grade level, which was divided into three groups (Group 1: 9th Grade; Group 2: 10th Grade; Group 3: 11th and 12th Grade) for this series of ANOVA analyses.

Table 2 presents the findings for the ANOVA tests. The results show that at least two groups differ on GPA. The Post hoc comparisons using the LSD Test indicate that 9th graders have a significantly higher GPA than both 10th and 11th and 12th graders.

Race. The second series of ANOVA analyses included the independent variable race, which was also divided into three groups (Group 1: African American; Group 2: Latino; Group 3: Other).

The results for this series of ANOVA tests are presented in Table 3. The results show that at least two groups differ on GPA. The Post hoc comparisons using the Bonferroni Test indicate that African American students reported a significantly higher GPA than Latino students.

Relationship among GPA, Loneliness, and Social Media Use

To identify the relationship among the main variables of this study, a series of Pearson's product moment correlations were performed to compare bi-variate associations of the inferential analysis variables. This test also used quasi-quantitative variables that were derived from the original ordinal categorical variables social media use and GPA. Table 4 shows the results of this test, which indicates that there is a weak, but significant, negative correlation between GPA and loneliness. This relationship suggests that, as loneliness increases, GPA decreases, and vice-versa.

The Variance in Loneliness Accounted for by Social Media Use and GPA

The percentage of the variance in Loneliness accounted for by GPA is $r^2 = (-.155)^2 = .024$. In other words, about 2% of the variance in loneliness is accounted for by GPA. Since the correlation coefficient between social media use and loneliness is not significant, social media use cannot account for any of the variance in loneliness.

Discussion

The present study explored the association between academic achievement, loneliness, and social media use among high school students as well as the demographic characteristics associated with these three elements. This study also identified the percentage of variance in loneliness accounted for by social media use and GPA. Results yielded six main findings. First, female participants reported higher levels of loneliness than male students, and females also reported checking social media more frequently than males. Additionally, 9th graders reported higher GPAs than other grade levels, and African Americans reported a higher GPA than Latinos. Further, the association between loneliness and GPA suggests that the higher the level of loneliness the lower the GPA. Finally, only 2% of the variance in loneliness is accounted for by GPA.

In attempting to clarify mixed results, some of the findings of this study are aligned with previous explorations of the topic. For instance, similar to findings by Amichai-Hamburger and

Ben-Artzi (2003), this study found no relationship between loneliness and social media use. Additionally, like Dobson, Campbell, and Dobson (1987), this study found a negative correlation between loneliness and GPA; however, while that study found a strong correlation, this study only found a weak relationship between loneliness and GPA, which led to a very small (2%) variance in loneliness accounted for by GPA, in contrast to a 61% of variance found in Dobson, Campbell, and Dobson's (1987) study. The difference in the strength of the relationship between loneliness and GPA might be explained by the fact that, in our study, GPA was self-reported. We believe that our study would be stronger had researchers directly accessed participants' GPA.

Another point worth consideration is the lack of relationship between social media use and GPA. Previous studies (e.g., Karpinski & Duberstein, 2009; Kirschner & Karpinski, 2010; Paul, Baker, & Cochran, 2012; Wohn & LaRose, 2014) found a negative relationship between time spent with social media and academic achievement. Our study differs from others, since we measured the number of times participants checked social media daily rather than the total time spent on social media—which could account for the different results we received. We wonder if the generation in question has already assimilated social media to an extent in which its use has low self-perceived impact in their daily duties. Future research is needed to continue clarifying the impact of social media on academic achievement, as well as to explore the assimilation of social media use and its implications.

Finally, a word is to be said regarding the implications of this study. The fact that female participants reported higher levels of loneliness should merit attention from teachers, school administrators, and parents who should consider the consequences of loneliness on academic achievement, especially in disciplines in which girls tend to be less successful. On average, female students reported checking social media more frequently than males. The gender differences regarding frequency of social media use and loneliness suggests the need for further research on this topic. In the classroom, an extra effort from teachers is needed to take emotional issues into consideration while planning classes and differentiating their strategies to properly connect with all students.

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Table 1***Mean Differences between Gender Groups***

Variable/Group	<i>n</i>	<i>M</i>	<i>SD</i>	Mean Diff.	<i>SE</i> Mean Diff.	<i>t</i>
Loneliness				3.32	0.97	3.31*
Female	174	40.26	9.75			
Male	170	37.03	8.28			
Social Media Use				2.27	0.61	3.69*
Female	173	11.03	5.52			
Male	170	8.75	5.89			
GPA				0.77	0.78	0.98
Female	173	2.80	0.72			
Male	165	2.73	0.72			

Note. * $p < .05$. *M* = Mean; *SD* = Standard Deviation; *SE* = Standard Error.

Table 2***Results of ANOVA Findings for Grade Level***

Variable/Group	<i>n</i>	<i>M</i>	<i>SD</i>	<i>F</i>
Loneliness				0.30
9 th grade	133	38.92	8.59	
10 th grade	137	38.93	9.99	
11 th and 12 th grades	70	37.96	8.84	
Social Media Use				0.45
9 th grade	133	10.11	5.66	
10 th grade	136	9.94	7.70	
11 th and 12 th grades	70	9.30	6.24	
GPA				3.08*
9 th grade	129	2.88	0.71	
10 th grade	136	2.71	0.75	
11 th and 12 th grades	70	2.65	0.65	

Note. * $p < .05$. *M* = Mean; *SD* = Standard Deviation.

Table 3**Results of ANOVA Findings for Race**

Variable/Group	<i>n</i>	<i>M</i>	<i>SD</i>	<i>F</i>
Loneliness				0.68
African American	126	39.18	9.18	
Latino	105	39.09	8.81	
Other	113	37.90	9.67	
Social Media Use				0.02
African American	126	9.86	5.64	
Latino	104	10.04	5.91	
Other	113	9.90	5.94	
GPA				5.88*
African American	124	2.92	0.65	
Latino	103	2.59	0.76	
Other	111	2.77	0.72	

Note. * $p < .05$. *M* = Mean; *SD* = Standard Deviation.

Table 4**Pearson Correlation Coefficient**

Variables	1	2	3
1	GPA		
2	Loneliness	-.155**	
3	Social Media Use	.013	.017

Note. ** $p < .01$. Sample size (*n*) ranges from 338 to 345.