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Andrews University Honors Program

Honors Thesis (HONS 497)

Consumer Behavior in Social Mediums: A Study of the Impact of Social Networking Sites and Massively Multiplayer Online Role-Playing Games on College Students' Academic and Social Lives.

Laura Johnston

1 April 2011

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Abstract

Consumer Behavior is an interdisciplinary field that marketers use to understand the wants and behavior of consumers. It focuses on how people decide to spend their available resources, such as time or money, on a product or service and examines issues such as why, how often, and the impact of making such a decision.

This study will incorporate the Social Cognitive Theory's assessment of expected outcomes based on consumers' own direct experiences that incite continued participation with the Use and Gratification Theory's idea of social need that may result in need gratification, leading to unintended results. Users of SNSs and MMORPGs participate in social mediums because they expect positive outcomes, such as being able to satisfy their social needs online. However, this may result in unintended consequences, such as lower grades or diminished face-to-face social interaction.

My project examines the impact of social mediums on college students' academic and social lives by looking at academic performance, the presence of a significant other, and social interaction, in search of any unintended consequences. The analyses show that SNS users who spend much time on SNSs have lower grades if they have at least one very strong pressure to study. Students without very strong pressure do not have lower grades if they spend much time on SNSs; in fact, moderate SNS users had slightly higher grades. I also found that females who spend much time on SNSs are more likely to have a significant other than those who spend little time on SNSs. Males who spend much time on SNSs are less likely to have a significant other than males who spend little time on SNSs. Finally, the analyses show that students who spend more time on MMORPGs have lower grades than those who spend little time on them.

Introduction

Marketing, defined as “the activity, set of institutions, and processes for creating, communicating, delivering and exchanging offerings that have value for customers, clients partners, and society at large” (Keefe 2008), plays an important role in businesses and organizations. Marketing also includes understanding consumer behavior in order to make good marketing decisions. Consumer Behavior is an interdisciplinary field that marketers use to better recognize the needs and wants and behavior of consumers. It can range from a psychology focus to sociology to microeconomics to demography, looking at the different angles of consumer feelings and behavior (Solomon 2007). Consumer Behavior focuses on how people decide to spend their available resources, for example time or money, on consumption-related items such as a product or a service, and looks at everything from why, how often, and the impact of making such a decision (Schiffman and Kanuk 2007).

It is interesting to look at the reasons why a consumer would make the decision to spend a resource such as time on social mediums, for example, as well as how he/she uses the service and what impact it has on his/her life. Marketers are able to use this information to examine their products or services, and make decisions about how to improve them for the benefit of the consumers and society. The consumer behaviors of a specific target market, for example a college campus, would also be of interest to other individuals, such as college administrators who make decisions regarding students.

One type of service that has begun attaining interest from both marketers and researchers, especially in regard to young consumers such as college students, is social mediums. In particular, social networking sites (SNSs) such as Facebook, MySpace, and Twitter, and Massively Multiplayer Online Role-Playing Games (MMORPGs) such as World of Warcraft and Second Life, have become popular social mediums among these young consumers. Social networking sites can be defined as

web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) formulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the systems. The nature and organization of these connections may vary depending on the site (Boyd and Ellison 2008).

Likewise, gaming has taken advantage of the capability to virtually connect individuals via the internet. The character of video game playing has shifted from a solitary or small group activity into a large, thriving social network (Smyth 2007). MMORPGs are online gaming worlds and communities which are continuously evolving. Players from all over the world can meet, interact, and play together at any given time. Since both SNSs and MMORPGs create online communities and online social interaction, there is a developing interest in the impact of these online social ties on consumers.

There are two theories of particular interest in relation to this topic; the Social Cognitive Theory (SCT) and the Use and Gratification Theory. The Social Cognitive Theory suggests “reciprocal causation” among individuals, their behavior, and their environment. SCT indicates that behavior is an observable act and that behavior performance is determined mostly by the expected outcomes of behavior. These expectations are either formed by our own direct experiences, or else mediated by reinforcement observed through others. Internet usage, as a behavior of consumption, is therefore determined by the expected outcomes that follow from consumption (LaRose and Eastin 2004). Expected outcomes are organized around six basic types of incentives for human behavior: novel sensory, social, status, monetary, enjoyable activity, and self-reactive incentives (Bandura, 1986).

Beyond expected outcomes, the Social Cognitive Theory also has a construct of self-regulation (Bandura 1991) that describes how individuals monitor their own behavior, compare it to personal and social standards, and then apply self-reactive incentives to moderate their behavior.

When self-regulation fails, increased media consumption may occur (LaRose and Eastin 2004), an issue that has been conceptualized in terms of habit and deficient self-regulation (LaRose, Lin and Eastin 2003).

A habit is a behavior that is done often and easily, and it is a well-established predictor of behavior (Oulette and Wood 1998; Triandis 1980). Aarts, Verplanke and van Knippenberg, 1998, suggests that an environmental stimulus (e.g. seeing your laptop) triggers patterns of behavior (e.g. checking Facebook). The behavior patterns therefore follow a fixed cognitive schema, and become automatic. At first, a person might carefully consider “specific consumption behaviors,” such as options instead of using Facebook, but eventually the consideration process is forgotten and the behavior becomes a habit (Stone and Stone 1990). Repetitive usage can make people inattentive to the reasoning behind media behavior and evaluating alternative choices; this leads to deficient self-regulation. Deficient self-regulation is defined as a state in which conscious self-control is diminished. La Rose et al., 2003, proposed it as an explanatory mechanism for “problematic internet use.” As deficient self-regulation comes into effect, media behavior tends to no longer come under active consideration of its expected outcomes.

The Use and Gratifications Theory, on the other hand, assesses the role of gratification in human behavior. It is concerned with: (1) the social and psychological origins of (2) needs, which generate 3) expectations of 4) mass media or other sources, which lead to (5) differential patterns of media exposure (or engagement of other activities), resulting in (6) need gratifications and (7) other consequences, perhaps mostly unintended ones (Katz, Blumler, and Gurevitch 1973).

This study incorporates the Social Cognitive Theory’s assessment of expected outcomes based on consumers’ own direct experiences that incite continued participation in social mediums with the Use and Gratification Theory’s idea of social need that may result in need gratification, leading to unintended results. For example, a college student may have a social need that he or she

wants satisfied. That student decides to go on to an SNS or MMORPG, and the online community and chatting gratifies his or her social need. This positive experience causes the student to expect that outcome of gratifying social need every time he/she goes online, so as the student continues to use the SNS or MMORPG, it becomes a habit. However, the deficient self-regulation may result in unintended consequences to that user, such as lower grades or diminished quality of face-to-face social interaction.

My project, therefore, examined college undergraduate students and the impact of social mediums on their academic and social lives, in search of any unintended consequences. I looked at both SNSs and MMORPGs in order to determine if frequent use of certain types of activities on either of these social mediums influences students' academic performance and social lives. My research addressed the hours spent on the sites, in order to determine if frequent users of social mediums faced more unintended consequences than occasional users. This study also examined whether students who mainly engage in activities that foster online social interaction, such as chatting or messaging, see fewer negative consequences than students who engage in anti-social activities such as playing games or taking surveys. Although my research originally aimed to examine these factors on both SNSs and MMORPGs, due to the small sample size of students who played MMORPGs I analyzed the consequences of hours spent on both MMORPGs and SNSs, and the type of activity on only SNSs.

Academic performance was assessed by examining students' grades. Social interaction, meaning face-to-face interaction, was evaluated by the presence of a significant other in students' lives as well as by considering the quality of students' relationships with friends and classmates. These variables were further examined under the categories of gender, year in university, pressure to study, and time spent studying.

My hypotheses were that frequent usage of MMORPGs would have an effect on students' academic performance and social interaction, and that frequent usage of SNSs would not have an impact on academic performance and social interaction. My hypotheses were formed from past research on similar issues or areas of study.

I believed that frequent usage of MMORPGs would have an effect because past studies on MMORPGs and/or video games showed that the games were more likely to have a negative impact on students. In one study that was conducted, one hundred 18- to 20- year old participants were randomly assigned to play console, solo computer, arcade, or MMORPG games for one month. The students playing MMORPGs differed from the other groups, reporting that they spent more time playing, "worse health, worse sleep quality, and greater interference in 'real-life' socializing and academic work" (Smyth 2007). Cole and Griffiths, 2010, discussed MMORPGs and how past studies have suggested that "college students can develop compulsions to play MMORPGs, leading to social isolation, poor academic performance, and sleep deprivation" (American College Health Association 2005). It was demonstrated that it was the social interactions in online gaming that made playing MMORPGs considerably more enjoyable (Cole and Griffiths 2010).

On the other hand, I hypothesized that frequent usage of SNSs would not have an effect because recent studies have shown that Facebook, one of the most popular SNSs, does not have a significant negative relationship with grades. There have been conflicting research reports regarding Facebook and academic performance; some studies have suggested that Facebook use is related to lower grades and other studies argue that it isn't. Pasek, More and Hargittai, 2009, contested the arguments that Facebook usage lowered academic performance, after conducting a study using three large data sets. In this study, there was not a "robust negative relationship between Facebook use and grades." In fact, there was an indication that Facebook use is more common among individuals with higher grades. Similarly, Hargittai and Hsieh, 2010, found that neither SNS usage intensity nor

social practices performed on SNSs is “systematically related to students’ academic performance.” I founded my hypothesis based on their results and widened it to include SNSs in general, as well as suggesting that these conclusions might apply to social interaction as well as grades.

My project is unique in several ways. First of all, it is the first research done on social mediums from the perspective of their impact on academic and social lives, conducted on the Andrews University Campus. The project assessed a unique set of variables, with a combination of categories (gender, year in university, pressure to study, and time spent studying) that have not been examined in previous studies. The perspective of the study, looking at the SNS side in comparison to MMORPGs, along with this arrangement of variables and categories, made this study unique.

Methods

The first step in this study was an intensive review of past research and literature. I read through a fairly extensive collection of articles and research results from journals and news publications. The results of my literature review helped me to gain a better understanding of the issue, identify variables and categories to use in my own study, and helped provide me with survey question examples for my descriptive research phase.

As previously mentioned, Smyth, 2007, as well as Cole and Griffiths, 2010, helped me develop my hypothesis on MMORPGs. Smahel, Blinka, and Ledabyl, 2008, discussed MMORPGs and addiction, giving me further understanding about the world of MMORPGs. Hart et al, 2009, gave me insights about developing questions on my survey for MMORPGs, as well as identifying categories such as gender and year in school. King, Delfabbro and Griffiths, 2010, mentioned gender differences and MMORPG social interaction, which helped me determine that those were both issues of interest. Wood, Griffiths, and Parke, 2007, examined time loss while playing videogames. This study showed that time loss could have both positive and negative consequences for players. Positive aspects included relaxation and escaping reality, whereas negative aspects included sacrificing other things in their lives, wasting time, and social conflict. This study, although on video games in general rather than MMORPGs, helped give me ideas for looking at unintended consequences of social mediums, and to understand what some of these consequences could be.

Literature research also helped me formulate my hypothesis on SNSs, as previously mentioned (Pasek, more and Hargittai 2009; Hargittai and Hsiah 2010). Madge, Meek, Wellens, and Hooley, 2009, helped me understand the role of a SNS like Facebook in universities. This study showed that the reasons for joining Facebook were first of all, making new friends at university, and second, keeping in touch with friends and family at home. The study suggested that it is important to maintain face-to-face interaction, which helped give me the idea of looking at social interaction as

a variable. Park, Kee, and Valenzuela, 2009, gave me further ideas regarding categories and variables, as the study analyzed demographics. The study also mentioned the personal and social needs that individuals fulfill by using social networks and mentioned the Uses and Gratifications Theory as an approach. Swartz, 2009, mentioned the popularity of social games on SNSs, such as Facebook application games like Farmville and Bejeweled, allowing me to consider the differences between activities fostering social interaction online and those that do not.

After contemplating ideas from similar previous research, I decided to examine the variables listed in Table 1.

Variables and Categories	
Social Mediums addressed in this study:	
<ul style="list-style-type: none"> • Social Networking Sites • Massively Multiplayer Online Role-Playing Games 	
Independent Variables	
<ul style="list-style-type: none"> • Time spent on SNSs and MMORPGs • Type of Activity spent on SNSs and MMORPGs 	
Dependent Variables	
<ul style="list-style-type: none"> • Grades • Presence of a significant other • Social interaction with friends/classmates 	
Categories	
<ul style="list-style-type: none"> • Gender (M/F) • Year in School (2 groups) • Pressure to Study (None/At least 1) • Time Spent Studying (3 groups) 	

Table 1: Variables and Categories

My study sought answers to the following research questions, using analysis of variance:

1. What is the relationship with grades between students who spend lots of time on SNSs and those who spend little/no time on SNSs?
2. What is the relationship with grades between students using activities that foster online social interaction and those who use activities that do not foster online social interaction?
3. What is the relationship with quality of face-to-face social interaction between students who spend lots of time on SNSs and those who spend little/no time on SNSs?
4. What is the relationship with quality of face-to-face social interaction between students using activities that foster online social interaction and those who use activities that do not foster online social interaction?
5. What is the relationship with the presence of a significant other between students who spend lots of time on SNSs and those who spend little/no time on SNSs?
6. What is the relationship with the presence of a significant other between students using activities that foster online social interaction and those who use activities that do not foster online social interaction?
7. What is the relationship with grades between students who spend lots of time on MMORPGs and those who spend little/no time on MMORPGs?
8. What is the relationship with the quality of face-to-face social interaction between students who spend lots of time on MMORPGs and those who spend little/no time on MMORPGs?
9. What is the relationship with the presence of a significant other between students who spend lots of time on MMORPGs and those who spend little/no time on MMORPGs?

In order to find the answers to these research questions, I decided to create and administer a cross-sectional sample survey administered to a convenience sample of undergraduate students on the campus of Andrews University. Hart et al, 2008, Hargittai and Hsieh, 2010, my advisors, Dr. Jacquelyn Warwick and Dr. Jerome Thayer, helped me decide how to design the survey questions. A former MMORPG player, Van Malcolm, gave me valuable information about playing MMORPGs and helped me design effective questions regarding MMORPGs. I decided to administer the surveys in paper form, to avoid bias toward students who are online often (Hargatti and Hsieh 2010).

The surveys were distributed in 15 of the largest, diverse (meaning a variety of majors and Freshman/Sophomores/Juniors/Seniors) classes. The professors allowed me to administer the surveys, which took between five and ten minutes to complete, either at the beginning or the end of class. The surveys were anonymous, and students were specifically asked to not put their names and the survey, and to only complete the survey once (there was some overlap between students and

classes). The surveys were collected in a covered box in order to preserve confidentiality. My survey was approved by the IRB; therefore the surveys included a detailed cover letter. The cover letter and survey is provided on the next 3 pages.

Dear Andrews Undergraduate Student,

Thank you for your participation in filling out this one page, front-and-back survey for my honors research project on Social Networking Sites and Massively Multiplayer Online Role Playing Games. The purpose of this research, conducted on the campus of Andrews University, is to determine if social mediums affect college students' academic and social lives, and your honest responses will help us gain a better understanding of the topic.

Your participation is voluntary, and refusal to participate or discontinuation of participation will involve no penalty to you. Your responses will remain completely anonymous, and the surveys will be confidentially kept in a secure office for 3 years after the completion of the study, as specified by the Institutional Review Board.

Please fill out the following questions completely according to the instructions on the survey. Once you have completed the survey, please put it in the box marked "Survey Responses" that will be located near me.

The results of the study will be presented at the Honors Symposium in April 2011.

Your participation is greatly appreciated, and I would like to thank you very much for your honest responses. Please feel free to contact me if you have any questions regarding the research.

Blessings,

Laura Johnston
johnstol@andrews.edu
979-299-9966

I have received the Informed Consent Letter and recognize that by completing and returning this survey, I am giving my informed consent to participate.

Social Mediums Survey

Thank you for filling out this front-and-back survey for Laura Johnston's honors research project on Social Networking Sites and Massively Multiplayer Online Role Playing Games. Your responses will remain completely anonymous, and will help us gain a better understanding of social mediums in relation to college students. Your participation is greatly appreciated!

I have received the Informed Consent Letter and recognize that by completing and returning this survey, I am giving my informed consent to participate.

1. How many hours per week do you spend on the following social networking sites or games?

If you have not used the site within the past month, please mark "Do not currently use."

	Do not currently use	Hours/week
Bebo		
Facebook		
Friendster		
Myspace		
Orkut		
Twitter		
Xanga		
Other: _____		

2. Please mark up to 6 of the following activities that you do most frequently when using the sites indicated above.

Chatting/ Instant Messaging	
Look at Friends' Photo Albums	
Stay in touch with friends you rarely see in person	
Play Games	
School or work related messages/ conversations	
Look at events or RSVPing to them	
Take surveys or quizzes	
Send private messages or emails to a person within the site	
Make plans with your friends	
Join Interest Groups	
Post your own photo albums	
Meet new friends	
Flirt with people	
Meet people to date	

3. How many hours per week do you spend on the following games?

	Do not currently use	Hours/week
Dungeons & Dragons Online		
EverQuest II		
Guild Wars		
Lord of the Rings Online		
Second Life		
Aion		
World of Warcraft		
Other: _____		

4. Please mark up to 6 of the following activities that you do most frequently when using the sites indicated above in Question 3.

Chatting/ Instant Messaging (voice or typing)	
Participate in Player vs Player	
Post on message boards	
Go on quests	
Participate in raids	
Lead raids	
Power Leveling	
Collect Flair/Accessories/Add-ons	
Join Player Associations/Guilds/Kinships	
Participate in Seasonal Events/Festivals	
Send private messages/ emails to players	
Meet new friends	
Flirt with people	
Meet people to date	

5. On average, how much time do you spend studying per week? Please select only one option.

0 hours	1-4 hours	5-8 hours	9-12 hours	13-16 hours	17-20 hours	20+ hours

6. Do you have a relationship with a significant other? Yes ___ No ___

7. How would you rate your relationship with the following people?

	<i>Very Bad</i>	<i>Bad</i>	<i>Fair</i>	<i>Good</i>	<i>Very Good</i>	<i>Not Applicable</i>
Significant Other						
Friends interacted with face-to-face						
Online friends						
Classmates						

8. What best describes your grade average this year? Please only select one option.

A's (4.0 GPA)	More A's than B's (3.75)	A's and B's (3.5)	More B's than A's (3.25)	B's (3.0)	More B's than C's (2.75)	B's and C's (2.5)	More C's than B's (2.25)	C's (2.0)	More C's than D's (1.75)	C's and D's (1.5)	More D's than C's (1.25)	D's or lower (1.0 or less)

9. How much pressure do you have from each of the following sources?

	None	Weak	Moderate	Strong	Very Strong	Not Applicable
To study in order to get into graduate school						
To study because of the difficulty of my major and my assignments						
To study because of the competitiveness of the job market in my field						
I feel pressure to study from my parents						
I feel pressure to study from my significant other						
I feel pressure to study from my friends						

10. Gender Male Female

11. What is your major? _____

12. What year in university are you?

- Freshman
- Sophomore
- Junior
- Senior
- None of the above. Please explain _____

13. How many credits are you taking this semester?

_____ Credits

In Questions 1 and 3, I determined the time each student spends on social mediums by asking them to write the number of hours they spend on a provided list of SNSs (Bebo, Facebook, Friendster, Myspace, Orkut, Twitter, Xanga, or other) and MMORPGs (Dungeons and Dragons Online, EverQuest II, Guild Wars, Lord of the Rings Online, Second Life, Aion, World of Warcraft, or other). In Questions 2 and 4, I asked the students which activities they are most likely to participate in when using SNSs or MMORPGs, in order to examine whether they are engaging in activities fostering online social interaction or not.

My dependent variables questions were Questions 6 through 8. Students were asked whether or not they have a significant other in Question 6, and in Question 7 they were asked to rate their relationship with face-to-face friends/ classmates in order to consider social mediums' impact on college students' social interaction. Question 8 asked students what grades they normally receive on a scale of A's, More A's than B's, A's and B's, More B's than A's, B's, etc, similar to Hargatti and Hsieh's 2010 study grade scale, in order to examine academic performance. Questions 6, 9, 10, and 12 asked about the categories I was interested in examining. Question 6 asked students how much time they spend studying, with blocks of time as options to select. Question 9 asked students how much pressure they feel from graduate school requirements, the difficulty of their major and assignments, the competitiveness of the job market, parents, friends, and their significant other in order to examine pressure to study. Question 10 asked students for their gender, and Question 12 asked them to state what year in university they are.

Additionally, Question 11 asked students for their major field of study in order to be certain that our completed surveys came from a random sample of students (instead of only business students, for example). Question 13 asked students for the number of credits they

were taking so that data from students taking only a couple of credits could be taken out in order to not skew the data from students taking a normal load.

These questions all related to the variables that I am interested in; mainly seeing how frequent use and types of activities on SNSs and MMORPGs impact college students' academic performance (determined by grades), their social interaction with peers, and the presence of a significant other, considering gender, year in university, pressure to study, and time spent studying.

The analysis of the survey results was conducted with a statistician who is my secondary advisor, Dr. Thayer. We used analysis of variance to determine relationships between variables. We had 460 students who answered the survey and fit within the parameters of our study (undergraduate, taking 7+ credits, appeared to answer the survey honestly) and 458 students who served as our sample size because of 2 who were missing information.

On Question 1, we discovered that several students wrote “a lot” or “all the time” for the number of hours they used a particular SNS. These students were assigned the highest number of hours that other students had put under that SNS site. Therefore, Facebook users who wrote “a lot” or “all the time” were given 51 hours, and Twitter users were given 31 hours.

We summed the hours that users spent on SNSs to find SNS Time, which was then grouped into three sections: 0-5 hours, 6-12 hours, and 13+ hours. This grouping was created so that “little” time on SNSs would average out to around an hour or under each day, “moderate” time would be closer to one to two hours per day, and “a lot” of time

would be over two hours per day. This grouping gave us more even sample sizes, as shown in Table 2 below.

SNSTimeGroup

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00 0-5 hrs	221	48.0	48.3	48.3
	2.00 6-12 hrs	144	31.3	31.4	79.7
	3.00 13+ hrs	93	20.2	20.3	100.0
	Total	458	99.6	100.0	
Missing	System	2	.4		
Total		460	100.0		

Table 2: SNS Time Group

Hours spent on MMORPGs, similarly, was summed and regrouped into MMORPG Time Groups of 0 hours, 1-4.5 hours, and 5+ hours, as shown in Table 3 below.

MMORPGTimeGroup

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 0	407	88.5	88.9	88.9
	1.00 1-4.5 hrs	20	4.3	4.4	93.2
	2.00 5+ hrs	31	6.7	6.8	100.0
	Total	458	99.6	100.0	
Missing	System	2	.4		
Total		460	100.0		

Table 3: MMORPG Time Group

In order to analyze whether activities that fostered online social interaction had a different impact on students than activities that did not foster online social interaction, I assigned each SNS activity in Question 2 with either a plus for fostering social interaction or a minus for not fostering social interaction.

Pluses:

- Chatting/ IMing +
- Look at friends' photo albums +
- Stay in touch with friends you rarely see in person +
- School- or work-related messages/conversations +
- Send private messages or emails to a person within the site +
- Make plans with your friends +
- Meet new friends +
- Flirt with people +
- Meet people to date +

Minuses:

- Playing Games –
- Looking at events or RSVPing to them –
- Take surveys or quizzes –
- Join Interest Groups –
- Post your own photo albums –

The pluses were called NHighSNS and the minuses were called NLowSNS, for high social interaction and low social interaction. The NHighSNSs were recoded and grouped into (1) 0-2 activities, (2) 3 activities, (3) 4 activities, and (4) 5+ activities, based on how many high activity types were selected. Similarly, NLowSNS was grouped into (1) 0 activities, (2) 1 activity, (3) 2 activities, and (4) 3+ activities. We then conducted a cross tabulation of NHighSNS * NLowSNS, so that the scale went from -3 (More Low Social Interaction Activities) to +3 (More High Social Interaction Activities). In other words, a positive sign showed higher social interaction activities, and a negative sign showed lower social interaction activities, as shown in Table 4 below.

TypeSNS

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid -3.00 More Low Social Interaction Activities	22	4.8	4.8	4.8
-2.00	78	17.0	17.0	21.7
-1.00	65	14.1	14.1	35.9
.00	199	43.3	43.3	79.1
1.00	30	6.5	6.5	85.7
2.00	59	12.8	12.8	98.5
3.00 More High Social Interaction Activities	7	1.5	1.5	100.0
Total	460	100.0	100.0	

Table 4: Type of SNS Activity

We coded gender as 1 ‘Male’ and 2 ‘Female.’ Students’ year in university was grouped by underclassmen (Freshmen/Sophomores) and upperclassmen (Juniors/Seniors). We considered analyzing each class separately, but because of our sample size we decided to group the year in school in this way.

Pressure to study was looked at according to which students marked **very strong** pressures. Table 5 shows the frequency distribution of which students did not mark any very strong pressures, which ones marked one, and which ones marked two, three, etc., to the one person who marked that they experienced very strong pressure from all areas.

NVeryStrongPressure

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	217	47.2	47.2	47.2
	1.00	114	24.8	24.8	72.0
	2.00	53	11.5	11.5	83.5
	3.00	51	11.1	11.1	94.6
	4.00	21	4.6	4.6	99.1
	5.00	3	.7	.7	99.8
	6.00	1	.2	.2	100.0
	Total	460	100.0	100.0	

Table 5

Pressure to study was given two groups: (0) anyone who did **not** mark one or more **very strong** pressures and (1) anyone who **did** mark one or more **very strong** pressures that they are experiencing, as shown in Table 6.

NVeryStrongPressure

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 No Very Strong Pressure	217	47.2	47.2	47.2
	1.00 At Least One Very Strong Pressure	243	52.8	52.8	100.0
	Total	460	100.0	100.0	

Table 6

The time students spend studying was also grouped into three: (1) 0-8 hours, (2) 9-16 hours, and (3) 17+ hours. This grouping allowed us to study and analyze the relationships better, keeping in consideration our sample size. The time spent studying frequency is shown in Table 7.

Q5

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 0-8 hrs	185	40.2	41.0	41.0
	2 9-16 hrs	174	37.8	38.6	79.6
	3 17+ hrs	92	20.0	20.4	100.0
	Total	451	98.0	100.0	
Missing	System	9	2.0		
Total		460	100.0		

Table 7: Time Spent Studying

We looked at the average GPAs to determine grades and academic performance. In order to examine the presence of a significant other, we assigned (1) as ‘yes,’ has a significant other, and (2) ‘no,’ does not have a significant other, as demonstrated in Table 8.

Q6

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yes	171	37.2	37.6	37.6
	2 No	284	61.7	62.4	100.0
	Total	455	98.9	100.0	
Missing	System	5	1.1		
Total		460	100.0		

Table 8: Presence of a Significant Other

The quality of face-to-face social interaction was evaluated by coding the responses: (1) Very Bad, (2) Bad, (3) Fair, (4) Good, and (5) Very Good, and then taking the mean of the responses for each student.

We used two types of analysis of variance or ANOVA to determine whether or not there was a significant relationship between our variables. One-way ANOVA was used to examine the relationships between my independent and dependent variables. The second type, Two-way Analysis of Variance, was used to include the categories, such as gender. We decided to declare a relationship to be statistically significant, which tells “whether a difference is reliable in light of random errors” (Patten 2004), at the probability level of $p < .05$.

Results

The analyses show some interesting relationships and information about the impact of social mediums on college students. We discovered that the most commonly used Social Networking Site is Facebook, with 423 users out of the 458 sample size. Twitter was the second most popular SNS, with 55 users out of 458. Out of the 51 students who marked that they played an MMORPG, the most frequently selected MMORPG with 33 users was “Other,” which included a range of MMORPGs such as Runescape and League of Legends. World of Warcraft was the second most popular MMORPG marked, with 12 users out of the 51 MMORPG players.

The analyses showed no significant relationship between SNS type of activity and any of the dependent variables (grades, presence of significant other, and face-to-face social interaction), in any of the categories (gender, year in university, pressure to study, time spent studying). However, the analyses did show three significant relationships; two in relation to SNS Time and one in relation to MMORPG Time.

The first significant relationship showed that SNS users who spend much time on SNSs have lower grades if they have at least one very strong pressure to study. Students without very strong pressure do not have lower grades if they spend much time on SNSs; in fact, moderate SNS users had slightly higher grades. Table 9 shows the average GPA (labeled ‘Mean’ in the table) of students in the different SNS Time Groups (which shows how many hours each student spends Social Networking), if they are under No Very Strong Pressure or At Least One Very Strong Pressure. Table 10 demonstrates the significance of the relationship at Sig .020, and Fig. 11 depicts the graph showing this relationship.

Descriptive Statistics

Dependent Variable: Q8

NVeryStrongPressure	SNSTimeGroup	Mean	Std. Deviation	N
.00 No Very Strong Pressure	1.00 0-5 hrs	3.2550	.48086	101
	2.00 6-12 hrs	3.3269	.47788	65
	3.00 13+ hrs	3.2935	.41934	46
	Total	3.2854	.46620	212
1.00 At Least One Very Strong Pressure	1.00 0-5 hrs	3.4038	.46983	117
	2.00 6-12 hrs	3.2244	.51059	78
	3.00 13+ hrs	3.1809	.52828	47
	Total	3.3027	.50265	242
Total	1.00 0-5 hrs	3.3349	.47968	218
	2.00 6-12 hrs	3.2710	.49691	143
	3.00 13+ hrs	3.2366	.47829	93
	Total	3.2946	.48552	454

Table 9

Tests of Between-Subjects Effects

Dependent Variable: Q8

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	2.616 ^a	5	.523	2.250	.049
Intercept	4321.187	1	4321.187	18584.288	.000
SNSTimeGroup	.620	2	.310	1.333	.265
NVeryStrongPressure	.049	1	.049	.211	.646
NVeryStrongPressure * SNSTimeGroup	1.840	2	.920	3.957	.020
Error	104.168	448	.233		
Total	5034.688	454			
Corrected Total	106.784	453			

a. R Squared = .024 (Adjusted R Squared = .014)

Table 10

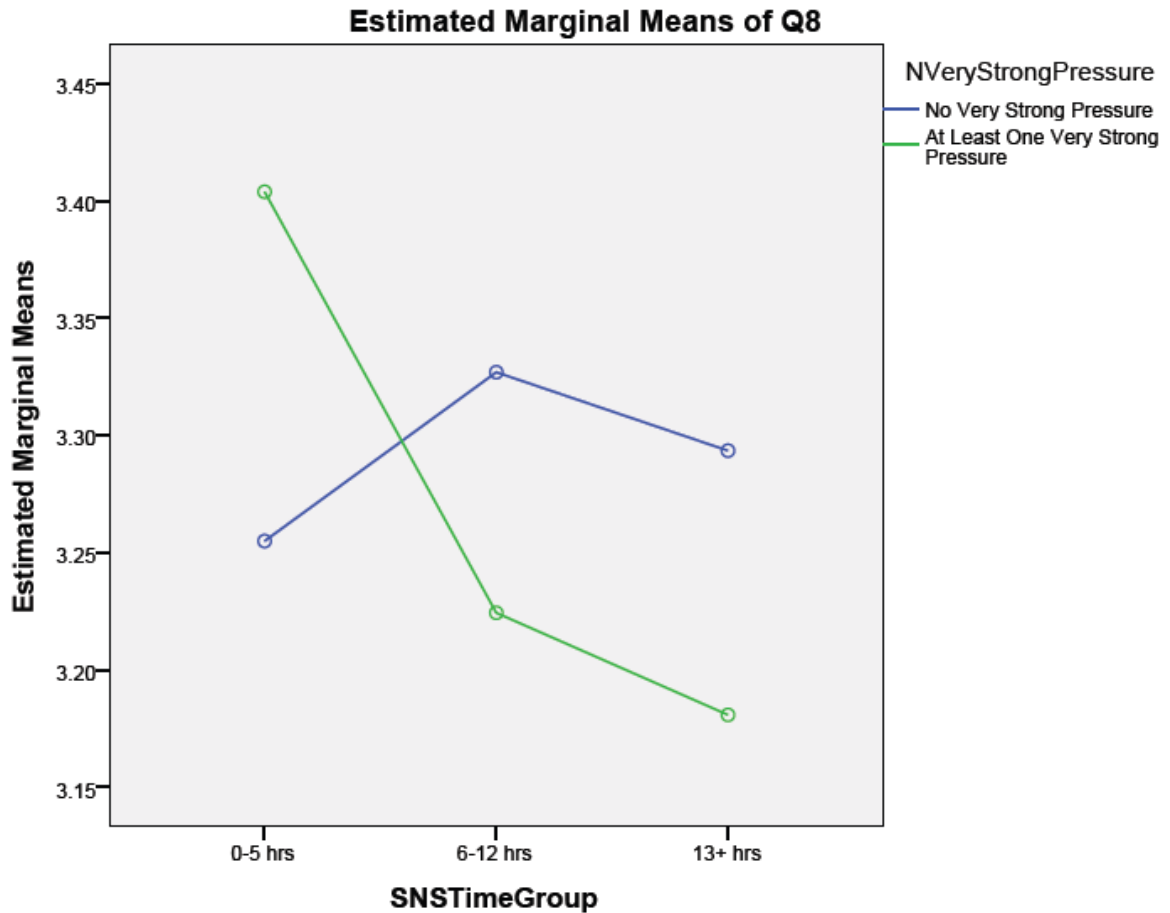


Fig. 11

As the graph in Fig. 11 shows, students with no very strong pressure who spend 0-5 hours per week on an SNS have an average GPA of 3.25. The average GPA increases to close to 3.33 as students without very strong pressure spend 6-12 hours per week social networking. However, as the number of hours per week spent social networking grows to 13 or more hours, the GPA decreases slightly to 3.29. On the other hand, students *with* very strong pressure to study who spend 0-5 hours per week social networking have an average GPA of 3.4. The average GPA of students with very strong pressure who spend 6-12 hours per week on SNSs drops to 3.22, and the students with very strong pressure who spend 13 or more hours on SNSs have an average GPA of 3.18. This is an interesting significant

relationship; perhaps students under very strong pressure to study feel more stress, as well, which might affect their grades when they feel they have too much to do when spending lots of time on SNSs, whereas students without very strong pressure are able to be more relaxed and balanced with their study and pleasure time.

The second significant relationship showed that females who spend a lot of time on SNSs are more likely to have a significant other than females who spend little time on SNSs. Males, however, who spend much time on SNSs are *less* likely to have a significant other than males who spend little time on SNSs. Table 12 shows the mean of time spent on SNSs for both males and females who have ‘yes,’ a significant other or ‘no,’ not a significant other. Table 13 shows the significance of the relationship at .042, and Fig. 14 displays the graph of this relationship.

Descriptive Statistics

Dependent Variable:SNSTime

Q10	Q6	Mean	Std. Deviation	N
1 Male	1 Yes	6.3949	7.25183	70
	2 No	8.9774	10.70327	133
	Total	8.0869	9.71282	203
2 Female	1 Yes	10.8228	12.60311	101
	2 No	9.0567	11.16540	150
	Total	9.7673	11.77240	251
Total	1 Yes	9.0102	10.93379	171
	2 No	9.0194	10.93139	283
	Total	9.0159	10.92022	454

Table 12

Tests of Between-Subjects Effects

Dependent Variable:SNSTime

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	811.080 ^a	3	270.360	2.286	.078
Intercept	32385.065	1	32385.065	273.884	.000
Q6	17.373	1	17.373	.147	.702
Q10	529.402	1	529.402	4.477	.035
Q10 * Q6	492.834	1	492.834	4.168	.042
Error	53209.682	450	118.244		
Total	90925.198	454			
Corrected Total	54020.762	453			

a. R Squared = .015 (Adjusted R Squared = .008)

Table 13

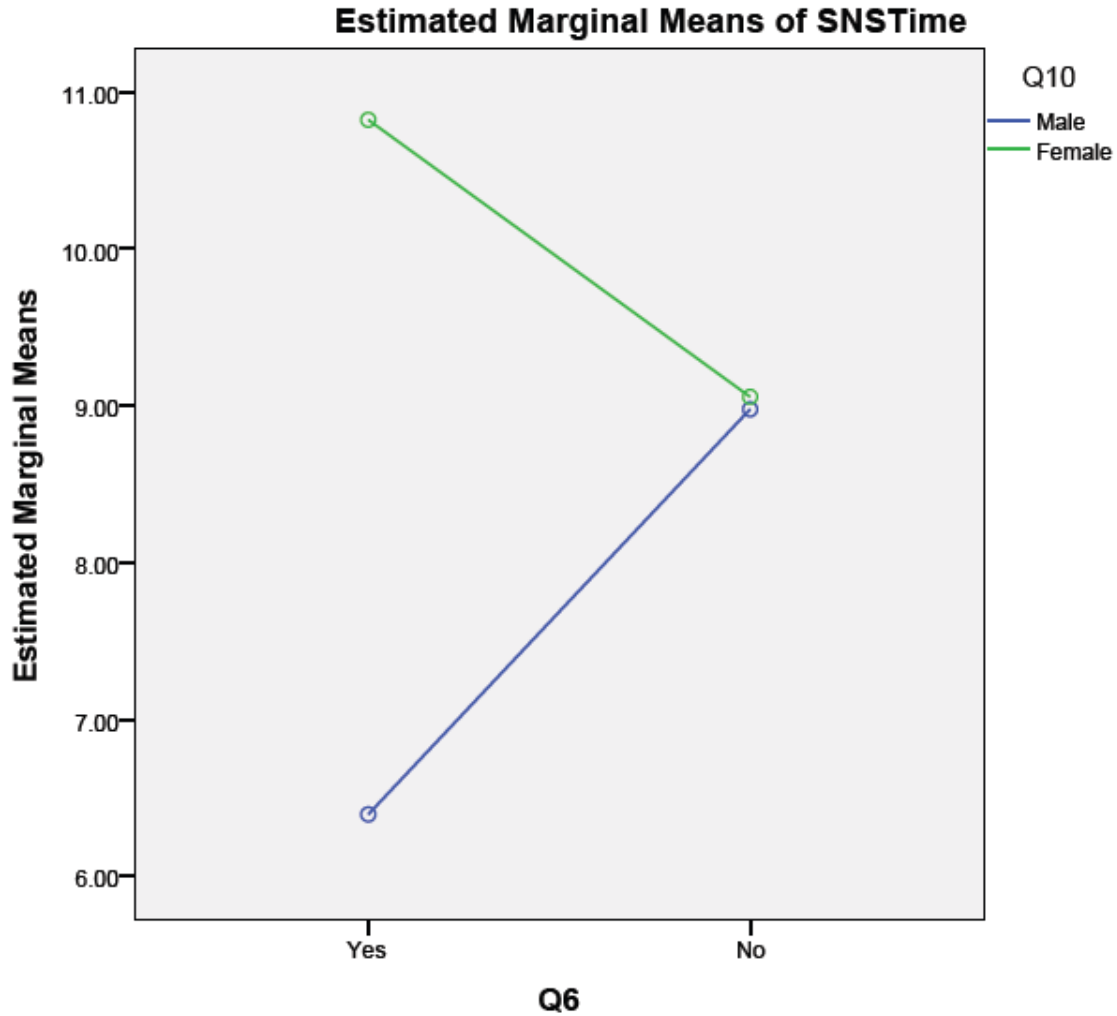


Fig. 14

As the graph in Fig. 14 shows, the females with a significant other are the ones spending more time on SNSs, with an average of 11 hours per week. Males with a significant other are the ones who spend less time on SNSs, with an average of 6.3 hours per week. Males and females who spend an average time of around 9 hours per week on SNSs do not have a significant other. The difference between the 11 hours per week of females with a significant other and the 6.3 hours per week of males with a significant other demonstrates the gender difference in relation to time spent on SNSs and the presence of a significant other.

The third significant relationship, found through One-way ANOVA, showed that the more time students spend on MMORPGs, the lower their grades are. Table 15 shows that students who do not play MMORPGs have an average GPA of 3.3158. Students who spend 1 to 4.5 hours per week playing MMORPGs have an average GPA of 3.2375, and students who play MMORPGs for 5 or more hours per week have a lower GPA average of 3.0565. Table 16 shows that this relationship between MMORPG Time and GPA has a significant relationship of .014, and Fig. 17 illustrates the relationship in a graph.

Descriptives

Q8	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
.00 0	403	3.3158	.47613	.02372	3.2691	3.3624	1.75	4.00
1.00 1-4.5 hrs	20	3.2375	.36702	.08207	3.0657	3.4093	2.50	3.75
2.00 5+ hrs	31	3.0565	.60797	.10919	2.8334	3.2795	2.00	4.00
Total	454	3.2946	.48552	.02279	3.2498	3.3394	1.75	4.00

Table 15

ANOVA

Q8	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.004	2	1.002	4.312	.014
Within Groups	104.781	451	.232		
Total	106.784	453			

Table 16

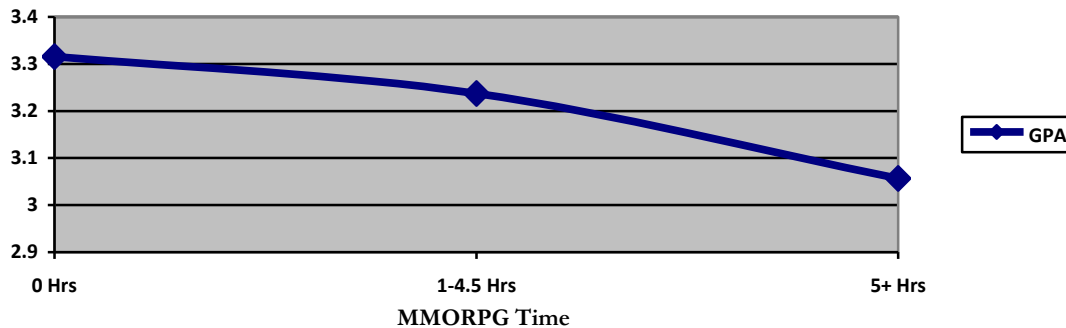


Fig. 17: Relationship between MMORPG Time and GPA

The graph gives a visual illustration of how GPA decreases as students spend more time on MMORPGs. It make sense that if a MMORPG is an online social world that encourages people to spend more time playing in order to improve, students may be drawn into this alternative reality and have lower grades as a result.

Discussion

The findings of this study partially accept my hypotheses, as shown below broken into detail.

- Frequent usage of SNSs will not have an effect on grades- *partially reject; only if under very strong pressure to study.*
- Frequent usage of SNSs will not have an effect on the presence of a significant other- *partially reject; only has an effect under gender.*
- Frequent usage of SNSs will not have an effect on relationships with face-to-face friends/classmates- *accept*
- The type of SNS activity will not have an effect on grades- *accept*
- The type of SNS activity will not have an effect on the presence of a significant other- *accept*
- The type of SNS activity will not have an effect on relationships with face-to-face friends/ classmates- *accept*
- Frequent usage of MMORPGs will have an effect on grades- *accept*
- Frequent usage of MMORPGs will have an effect on the presence of a significant other-*reject*
- Frequent usage of MMORPGs will have an effect on relationships with face-to-face friends/classmates- *reject*

The analysis showed that MMORPGs would be more likely to have a negative impact on academic performance than SNSs. However, the study also provided some results among the categories that were interesting. The significant relationship between very strong pressure to study, time spent on SNSs, and grades were interesting and suggested that SNSs might have a negative impact on grades under certain circumstances (such as being under very strong pressure to study). The significant relationship between gender, time spent on SNSs and presence of a significant other was also interesting, seeing the differences in how males and females who spend time on SNSs have a significant other. These two findings showed that the hypothesis that SNSs would not have a negative impact on college students' academic and social lives is only partially accepted, since very strong pressure to study along

with SNS time affected academic performance and time spent on SNSs affected the presence of a significant other depending on gender. My hypothesis that MMORPGs would have a negative effect on academic performance was accepted by the research, although my hypothesis that MMORPGs would have a negative effect on students' social lives was rejected.

The results of the analyses support Smyth's 2007 study that showed MMORPGs interfering with academic work, and agree with other studies that suggest video game playing may have a detrimental effect on students (Smahel, Blinka, and Ledabyl 2008; Wood, Griffiths, and Parke 2007). The analyses also related to Pasek, More and Hargittai, 2009, as well as to Hargittai and Hsieh, 2010, and their findings that there was not a negative relationship between Facebook and grades. My results supported the proposal that SNS usage does not affect grades *except* that when examined under different categories, very strong pressure to study was a significant relationship.

One of the strengths of my project was that it took into consideration categories such as pressure to study and analyzed them with the Two-way Analysis of Variance, allowing us to look deeper into possible factors and reasons for the behavior of students. Another one of my project strengths was the sample size. Considering the small campus of Andrews University and the limitations of doing research while a full-time student, I was pleased to have 458 valid surveys to use as data. The larger sample size helped to make the results regarding SNSs more valid.

One of the limitations of the project was the fact that, despite the large sample size of surveys and data, only 51 students said that they played MMORPGs. This meant that the actual sample size used on the MMORPG side of the research was quite small, and less valid.

The third significant relationship, therefore, is not as valid a conclusion as the relationships found about SNSs, because of the small MMORPG sample size.

Another limitation was that the project was based on self-reported data. The possibility exists that students misreported their social mediums behavior or other information, or that they unintentionally submitted false information such as through guessing. In regard to social mediums, people tend to think that they spend less time online than they do in reality. There is a difference in perceived time spent doing a behavior and actual time. If the time students spent on social mediums had been observed, the numbers might have differed from the time the students perceived and wrote down on the surveys.

A third limitation is the fact that there may be a variety of other factors affecting the results of the study apart from the variables and factors I addressed. For example, in the case of females who are more likely to have a significant other if they spend lots of time on SNSs, there may be other factors, such as the girls who spend more time on Facebook are more popular or outgoing anyway and therefore more likely to have a “significant other.”

A fourth limitation was the way we grouped the variables. Time spent on SNSs was grouped into three segments for the final analysis, but we also considered grouping it into 5 groups (0=0, 1=1-2 hrs, 2=3-6 hrs, 3=7-12 hrs, 4=13 +hrs), which may have had a different effect. We also considered grouping by thirds, with ‘most,’ ‘least,’ and ‘middle’ users. We decided that ‘little’ and ‘a lot’ of use was better for our purpose, but it is possible that another kind of grouping would have been better. We also grouped students’ year in university into two; Freshman and Sophomores were ‘underclassmen’ and Juniors and Seniors were ‘upperclassmen.’ The findings may have been different if the grouping had looked at all four classes instead of two groups.

The next step if this project were to be followed up by others, would be increasing the sample size of the entire study, and especially of MMORPG users, by taking the research to other universities. My advisor, Dr. Warwick, is considering expanding this study to other universities; this will give a larger and more reliable sample size. I would also suggest doing more detailed studies on the areas where we found significant relationships. My study was similar to taking a panoramic snapshot, where a wide picture of the situation was taken at one point in time. The details of the picture that are significant would make interesting future research. My project raises questions about MMORPGs and grades, which leads to thoughts about what can be done to help individuals succeed academically if they are experiencing academic difficulty due to MMORPG usage. Thus, a more detailed study on MMORPG and grades would be interesting; addiction to MMORPGs and that impact would be another thought-provoking study. My project also raises questions about students who are experiencing very strong pressure to study. Does this pressure cause stress and affect other areas of their lives, such as their social lives? Perhaps pressure to study could be looked at as an independent variable in future research.

My research helped support and identify unintended consequences of SNS and MMORPG usage. It has helped detect areas that would be interesting and beneficial to research in the future, and has given us an insight on the SNS and MMORPG consumption behavior of Andrews University undergraduates.

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