Facebook Profiles and Usage as Indicators of Personality

The Honors Program
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Student's Name: Erica Dawson
Faculty Sponsor: Heather P. Lacey, Ph. D.
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ABSTRACT

The online social networking website, Facebook, has greatly changed the way the world communicates. Face-to-face interactions have been replaced by wall posts, status updates and friends liking posts or leaving comments. This study looks at how certain cues on Facebook profiles relate to personality traits, specifically, extraversion, conscientiousness and emotional stability. Three hypotheses focused on profile photos and how frequently the users change their photo. I predicted that 1) extraversion scores would be higher for participants who use a party scene as their profile photo, 2) conscientiousness scores would be lower for these same participants, and 3) the emotional stability scores would be negatively related to profile photo changing frequency. A total of 170 first year college students at Bryant University were surveyed about personality traits and Facebook usage. Out of this sample, 59 users provided access to their profiles and profile picture for data coding. The first hypothesis, that extraversion and party photos are positively related, was supported. The other two were not. However, additional analyses using the self-reported behaviors from the Facebook usage survey identified several other Facebook characteristics and behaviors that could be used as an indicator for each of the three personality traits studied.

INTRODUCTION

The well-known account of how Mark Zuckerburg founded the social network website Facebook shows how the world has been changed by one website. There has been an incredibly fast rise of social media generally, and Facebook in particular. According to Experian Hitwise (2011), as of December 2010 Facebook is the top social networking website with 62.40% of the U.S. market share of visits. Facebook has even topped Google as the most visited site in the U.S. (Watkins & Lee, 2010). Facebook has been used to promote everything from corporations to social, environmental and political causes, products, sports teams, television shows, and movies. Its influence is clearly evident for businesses. This social network website now helps companies advertise their products and helps gain support for social, environmental and political causes. Companies put their Facebook page at the end of their advertisements and ask viewers to "like" their page. Facebook itself has become a top means of advertising for many companies. The research company, eMarketer, has predicted that in the year 2011 there will be a 55% increase in spending by U.S. marketers on social networking websites to over $3 billion, with a majority of this being spent on advertising on Facebook (Facebook Drives US Social Network Ad Spending Past $3 Billion in 2011, 2011).

While Facebook has become an important commercial site, it is primarily a social site and it is changing the way interpersonal interactions work. For many people, it is a primary venue for keeping in touch with friends and family. For example, college freshmen use it as a means of keeping in touch with those friends and family members that may now be further away, and before arriving at college, students use it to meet their new roommates and classmates. As more social interactions take place online, the process of self-presentation is changing. First impressions are now often based upon a person's profile and not a face-to-face interaction. It is uncertain whether Facebook users' actions are always intentional, or whether users understand what image of themselves they are advertising to other users.

This project will help to improve understanding of how individuals present themselves on a social network. Online social networks have become more popular among many different demographics, and while there is a lot of previous research about self-presentation and impression management dating back to Goffman's (1959) early work, there is relatively little

that specifically addresses online self-presentation. In online interactions, the influence of nonverbal behavior on first impressions is eliminated, so first impressions are frequently made based on a picture and a limited selection of posted information instead. While impression management on social networks is very different than when using any other medium, it also shares many similarities. Just as nonverbal and verbal cues allow inferences about personality in live interactions, profile pictures may similarly lead to conclusions about personality. This research will help to decode aspects of profile pictures that reveal information about personality. This is particularly important because a key feature of social networking is that a single photo may be observed by distinct groups of contacts, such as family, friends, and colleagues. Often, people's profiles are seen by unintended audiences, so it is important to understand how photo selection may reveal personality traits to both known and unknown online audiences.

In addition to the user's profile photos, there are numerous other Facebook behaviors and posted information that are visible to viewers and may also influence viewers' impression of the user. Facebook profiles reveal a great deal of information about users. Some factors can include: how many friends the users have, who they include as their friends, how often they update their status or change their profile picture, and their relationship status. Some of these things are automatically seen by viewers while others can be monitored by the user. For example, users can decide if they wish to post their relationship status and which gender they are interested in. This information reveals information about the user. In addition, the decisions to share this information or not reveals even more about the user.

LITERATURE REVIEW

Personality Traits on Facebook

There is much debate about whether the online presentation of one's self is accurate. Unlike face-to-face interactions, online users have an extended amount of time to prepare a status or wall post. This extra time might make a difference in how the individual communicates in comparison to face-to-face interactions. Many Facebook profiles contain inaccurate information. For example, people exaggerate how many friends they have by indiscriminately "friending" every possible acquaintance, to boost their perceived popularity. Users may also

exaggerate how close they are with their Facebook friends by constantly commenting on the user's posts or frequently liking that person's status in order to give the appearance that they have a very close relationship. Users also have the ability to post a "photoshopped" or digitally enhanced photo which does not give a truly accurate depiction of their physical appearance. When users exaggerate their looks, number of "friends," and number of interactions with these "friends," attempting to portray themselves in the best possible light, there may be unexpected and unwanted consequences if the attempts are transparent. The user may instead come across as manipulative and insecure.

Vazire and Gosling (2004) divided inferences about one's personality into two categories, identity claims and behavioral residue. Their study concentrated solely on identity claims because these symbolic declarations about how the individual wishes to be seen are the main component on social networking sites. Vazire and Gosling (2004) tested whether identity claims convey a clear, consistent, and interpretable image about the user's identity within an online social networking context, and if so, how accurate these impressions are and whether they reveal an idealized report of the user's personality. Researchers focused on the "Big Five" personality traits (extraversion, agreeableness, conscientiousness, emotional stability, and openness to experience). These five traits "represent the core description of human personality" (Ciccarelli & White, 2010). For this study, observers recorded impressions about users' personalities based solely on their personal websites. Two close acquaintances of the user also reported their impressions of the user's personality. The users reported their own impressions along with an additional self-report of their ideal self-image.

Vazire and Gosling's (2004) results supported the conclusion that online social networking websites do generally reveal an accurate interpretation of the user's personality. There was a general consensus among the observers and they were able to form a clear and consistent impression about the user's personality (Vazire & Gosling, 2004). They did find two findings that were interesting about two of the "Big Five" personality traits (extraversion, agreeableness, conscientiousness, emotional stability, and openness to experience). Vazire and Gosling (2004) learned that while observers reported accurate levels of extraversion, it was the one personality trait that tended to be positively over scored by the observers. This

shows that users are effectively using impression management to enhance desired traits. The researchers also found that the conscientiousness findings were particularly enlightening. The findings suggested that someone will know as much as there is to know about a person's conscientiousness within the first few minutes of interaction (Vazire & Gosling, 2004). Next, the researchers compared the impressions made from online websites to those made in real-world contexts. Their prediction that looking at individuals' Facebook profiles would provide the observer with just as much information about the users' personalities as looking at their bedroom or office was supported by the results (Vazire & Gosling, 2004).

Following Vazire and Gosling's (2004) study, Gosling, Gaddis, and Vazire (2007) conducted a study investigating specific "Big Five" personality traits. The participants consisted of groups of 5 friends. Each participant rated themselves and their four friends in terms of personality. Eight months later, participants reported their ideal self ratings for personality and how they believed others would view them based on their Facebook profile. A group of nine observers rated participants' personalities based solely on their Facebook profile page and a sample of their posted pictures.

Gosling, Gaddis, and Vazire (2007) found that observer consensus, the level of agreement between the observers' assessments of the Facebook profiles, was significant for all "Big Five" traits with extraversion being the most significant, conscientiousness slightly less significant and emotional stability even less significant. This suggests that extraversion is the most easily determined by viewers. Emotional stability is harder to detect and interpret from a Facebook profile. This may be similar to face-to-face interactions in which extraversion comes across during the very first encounter. The cues about emotional stability may be more subtle and may take longer to decipher. Gosling, Gaddis, and Vazire (2007) also found that observer accuracy was significant for extraversion, agreeableness, conscientiousness, and openness to experience, but not for emotional stability. Extraversion once again had the highest significance (Gosling, Gaddis, & Vazire, 2007). This further supports that emotional stability is often harder to detect and extraversion is easier to recognize. Next, the researchers wanted to test whether the Facebook users knew what impressions they were conveying. The results showed that users were only aware of what their image conveyed for extraversion

(Gosling, Gaddis, & Vazire, 2007). The last step of the study was to test whether users were exaggerating certain traits through self-enhancement. This was found to be true for two of the five traits, emotional stability and openness to experience (Gosling, Gaddis, & Vazire, 2007). It is easy to understand why users would try to exaggerate this particular trait. To have a low level of emotional stability (i.e., high levels of "neuroticism") is not desirable.

These impressions that are made through viewing Facebook profiles are very important in today's society. Social networks are changing how individuals interact and form acquaintances. The social network is often the viewer's first exposure to the individual. It is helpful to know that while for the most part the impressions made from Facebook profiles are accurate, a few traits are enhanced. There are also many differences in the ways that some individuals or groups interact through social networking interactions. For example, gender differences have been identified for "friending" behavior. The marketing research firm, Rapleaf (2009), conducted a survey of 30.74 million social networkers, dividing them into four different groups based on the number of "friends" (i.e., 1-100, 100-1,000, 1,000-10,000, and greater than 10,000). The data showed that when comparing the two genders, women are more likely to have fewer friends on Facebook. Rapleaf (2009) suggested that women tend to focus more on nurturing these relationships and men concentrate on only gaining more friends. This suggests that the relationship between personality and quantity of Facebook "friends" is moderated by gender. Rapleaf (2009) theorizes that those users with more friends are concerned with only having more "friends" and not with the quality of those friendships.

Young, Dutta, and Dommety (2009) learned that many romantic cues are revealed through Facebook profiles. The two most obvious ways users can share their romantic interests are through sharing what gender they are interested in and whether they are currently single. It has become very common for individuals to search for romantic partners via the internet. Many people think of the traditional dating websites, but Facebook has also become a tool used to attract a potential partner. When the twenty Stanford undergraduate students were asked during a pilot study to rank steps on how to elicit contact from other Facebook users who are also interested in a romantic relationship the undergraduate students ranked listing a "single" relationship as the first and most important step (Young, Dutta & Dommety, 2009).

The study included the following other cues that the users utilize to extend the message that they are looking for a relationship: listing themselves as interested in men vs. women, providing religious views, providing educational information and providing contact information. The study suggests that users who share religious views are most likely looking for a partner who practices the same religion. These pieces of information provided by the users may be deduced to determine what traits they value in their future significant others. For example, if they include educational information, then this can also be seen as an important trait in a potential romantic partner.

Many of these factors influence each other. The study showed that if users listed themselves as interested in men vs. women or if they listed their religious views, then they were more likely to list that they are single (Young, Dutta & Dommety, 2009). There was a stronger significance for the relationship between users listing themselves as interested in men vs. women and listing their relationship status as single. Many people feel strongly about their religious views and the importance they place on their future partner sharing the same faith. This importance is found through users' Facebook profiles. Gender also plays a role in how an individual tries to make a romantic connection with others. It influences whether they want to form a connection as well. This gender difference may be particularly relevant for young adults. Gender stereotypes suggest that young males approach relationships differently than young females. Young, Dutta, and Dommety (2009) discovered that men were less likely than females to list that they were single on their Facebook profile. Facebook profiles can be used to detect users' personalities in the present, as well as some of their goals for the future. In particular, the researchers found that profiles can relay messages to users' potential future significant other.

One study conducted by Mikami, Szwedo, Allen, Evans and Hare (2010) has even offered support that one can learn about a user's past through viewing the user's Facebook profile picture. These researchers examined whether individuals' social and behavioral adjustments during their adolescent years related to behavior on social networking sites during their early twenties. The results showed that those who were better adjusted during their early adolescence (age 13-14) were more likely to use social network websites during their early

twenties (ages 20-22) (Mikami, Szwedo, Allen, Evans, & Hare, 2010). Their results also showed how profile pictures can reveal unintended information, not only about who the person is today but also about their personal and psychological history. The results showed that adolescents who displayed signs of depression were more likely to post inappropriate pictures when they were older (Mikami, Szwedo, Allen, Evans, & Hare, 2010).

In most of the studies that support the connection between one's personality and one's Facebook profile, researchers have used photos posted by the user as support for the connection (Gosling, Gaddis & Vazire, 2007; Mikami, Szwedo, Allen, Evans, & Hare, 2010; Kramer & Winter, 2008; Peluchette & Karl, 2010). In particular, the profile picture is very influential in forming viewers' impressions of the user. My study will focus primarily on the profile picture and what it reveals about the user's personality. A Facebook user's profile picture is one of the aspects of the profile that the user has complete control over. Other aspects are controlled partly by the user's friends as well. Users cannot fully control other people tagging them in pictures, commenting on the pictures, or posting comments on their wall or status. Users are able to un-tag a picture or delete a comment, but this is only after other users have had the opportunity to see it. Another reason that the profile picture is very influential is because it is generally the most widely viewed part of one's profile. Other pictures can be hidden and so can one's wall. However, most users still have their profile picture accessible to all Facebook users. This makes it one of the most powerful tools for forming one's image on Facebook.

Different Picture Styles

Facebook users who opt to post a profile photo have the task of choosing a picture for all of the Facebook community to view. People generally select a photo which displays them in a manner that they find agreeable. However, sometimes the picture selected by the individual as the best look isn't always the same picture that others would select. Researchers Costa and Bitti (2000) conducted a study to determine what picture style was preferred by the individual and what style was preferred by others. The results showed that the individual and the others viewing the individuals' pictures did not select the same picture. The pictures were categorized as portrait, half figure, and whole figure. When selecting their best photo people

chose the whole figure photo because of its ability to hide imperfections, but others looking at the pictures said that the portrait style was more attractive and showed ambition (Costa & Bitti, 2000). When looking at other aspects of the picture the researchers and viewers also disagreed about what picture best portrayed the individual. The study's authors suggested that smiling and having less of a head tilt signaled high self-esteem and viewers found the head tilting to be more attractive (Costa & Bitti, 2000). This study shows a lack of correspondence between how people view themselves and how others view them. The individual often selects a photo which they find most attractive, but others don't agree. By selecting a close up picture an individual is displaying confidence and willingness to show minor flaws. Someone who selects a picture from further away may be signaling low self-esteem and a desire to hide flaws.

Other aspects of photos have been shown to correlate with personality traits. A recent study focused on the effects that the background of the picture had on creating first impressions – specifically, how it affected the viewer rating the subject's face. Koji and Fernandes (2010) first studied neutral facial expressions against positive, neutral and negative backgrounds and then repeated the experiment using neutral, happy, and angry expressions against the three different backgrounds. The results strongly supported their hypothesis that a viewer's rating of a person's face in a photo will be influenced more by the emotional valence of the background, than by the person's facial expression. The background affected the impressions made by the viewers significantly more than the facial expression, with positive and negative backgrounds leading to positive and negative impressions respectively (Koji & Fernandes, 2010). This strong positive correlation shows that forming an impression based on a photo is significantly influenced by contextual factors. This is why the background of the photo is just as important, if not more, as the subject of the photo. Koji and Fernandes also tested whether the gender of the subject in the photo had an effect. If the person pictured was a male, the viewer's ratings of the subject's face were significantly influenced by the valance of the background. If the person pictured was a female, there was no significant relationship between the ratings of her face and the background. This relationship between facial ratings and the background of the photo was moderated by gender.

So far it has been shown that photos can greatly influence the impression made by viewers of the individual pictured. The style of the picture, the tilt of one's head, and the background of the picture all convey a message to the viewer. A 2008 study conducted in Germany by Kramer and Winter using a German social networking site very similar to Facebook studied the relationship between self-efficacy, extraversion and self-esteem and the type of profile picture by administering a personality survey and coding profile pictures based on facial expression, background and style. This study found that extraverts were more likely to have a photo with a different style (black and white, altered colors, or graphically edited). This shows that they are willing to be different and stand out.

College Students on Facebook

For this study I focused on first year students at Bryant University. College students are a particularly important group to study when discussing Facebook and managing one's image and profile. This class represents a time of change and transition for the individuals. The first year students are an ideal subject pool for this survey due to their general naïve nature towards the potential consequences of what is displayed on Facebook. Many of them may not stop and consider who might be seeing their profiles and pictures and what the consequences could be of a profile that does not accurately portray their personality. This particular age group is also readjusting to a new environment and trying to fit in. This can influence what image they wish to portray for themselves. Many of them may fail to realize what is actually being revealed about them through their Facebook profile. The researchers, Peluchette and Karl (2010), feel that more college campuses should promote the message about the possible negative consequences of what is posted on Facebook profiles, such as how Cornell University encourages students to "think about not only your marketability today as a cool guy or girl in your college social circle, but who you might want to be in five or ten years when posting an "identity" on the Internet."

In 2010, Peluchette and Karl looked at the pictures and information on college students' Facebook profiles. They found that many students intentionally misrepresent themselves to gain social acceptance (Peluchette & Karl, 2010). This age group generally has enough freedom to define themselves however they want to. They are also generally trying to find

where they fit in among their new group of peers. A recent study found that college students list establishing an identity as an important reason for using Facebook and pictures were one of the best ways to express themselves (Calvert, Pempeki, & Yermolayen, 2009). Peluchette and Karl (2010) found that students would be less likely to post inappropriate pictures if they wished to be viewed as hardworking and more likely to post them if they wished to be seen as sexually appealing, wild, or offensive. College students may sometimes show how they wish their peers would view them rather than how they are.

However, college students, especially first year students, may not always see the consequences of posting certain types of pictures. Students who are trying to fit in with the "cool" party kids in college might not be as thoughtful about selecting what pictures they share on Facebook and the wide range of other users who can view it. Peluchette and Karl (2010) surveyed 346 undergraduate students and asked them to rate on a scale of 1 *(strongly disagree)* to 5 *(Strongly agree)* the following statement, "It is very unlikely that anyone other than my close personal friends will read my social network profile." The results showed that the students were neutral in how likely it was that others are viewing their profile (M=2.69, SD=1.30). This means that many of them may believe that people outside of their close friends are viewing their profiles; however, they may be unconcerned about this broad and unintended audience when they are attempting to portray their image on Facebook. Peluchette and Karl (2010) found that students who are intentionally creating a sexually appealing, wild or offensive image reported being generally okay with strangers having access to their profile. The researchers suggested that students have found "comfort in anonymity." These students may not realize that some strangers, such as employers, will not always remain strangers and may have motives for seeking out their Facebook profile.

College students have learned to use Facebook to increase and improve their social connections. Researchers have argued that Facebook is not harming our ability to interact, but it is instead making us more social, just in different ways (Watkins & Lee, 2010). Watkins and Lee (2010) compared college students and recent college graduates – and found that there were some commonalities and some differences in how the two groups used Facebook. Both groups said they used Facebook mainly because of their desire to stay connected with family

and friends both near and far. Both groups are going through transitional stages in life. College students, especially first years, are moving from high school to college and college graduates are entering the "real world". These transitional stages influence what personal information they are willing to share on their Facebook pages. First year students display significantly more personal information and photos on their Facebook profiles and "friend" more people than when they were in high school. Conversely, when students graduate college they become more conservative and limit how much they post of Facebook. Watkins and Lee (2010) found that college students when compared to recent graduates are more likely to share personal information that could be seen as controversial such as, religious and political views. They also have more friends and login more frequently than recent graduates. This could be because college students are trying to make new friends and they rely more heavily on Facebook than college graduates. Graduates use Facebook more to maintain existing relationships and don't need to rely on it on a daily basis.

Sharing pictures is a major part of using Facebook. Across both groups of participants in Watkins and Lee's (2010) study, 87% of them commonly shared pictures on Facebook. Both groups agreed that posting photos was one of the top reasons to use Facebook. Across both groups of participants 41.9% ranked it as one of the top 3 activities. The types of photos posted are reflective of the individuals posting them. Watkins and Lee found that the top two types of pictures posted by this age group are social gatherings with their friends and family. In particular, women placed more emphasis on sharing important events with friends and family. For this reason, they were more likely to show pictures overall, and when men posted pictures they tended to show their personal interests, such as hobbies or scenery.

Facebook users often monitor and edit their profiles. The survey conducted by Watkins and Lee (2010) found that 81.5% of college students log in to Facebook at least once a day. In addition to selecting and posting pictures which highlight the aspects they wish to show others, users can also monitor the pictures added by their "friends" so that pictures displaying less admirable traits are not seen by others. Calvert, Pempeki, and Yermolayen (2009) found that women were more likely to un-tag a photo of themselves because they don't feel attractive in it and both genders said they have un-tagged pictures which showed them doing

something illegal (drugs or underage drinking). This shows that people do attempt to use impression management on Facebook.

Watkins and Lee's (2010) study found that while the majority of participants check Facebook on a daily basis, not as many reported that they logged in more than once a day. Similarly, the majority of users post pictures on their Facebook, but not all of them do it frequently. Less than 20% of college students and recent graduates post photos one or more times a week, with college students generally posting photos more frequently (Watkins & Lee, 2010). It is widely assumed that college students are trying to create an image for themselves. This could be one reason why they post more pictures, to match their constantly changing image.

Hypotheses

The literature on Facebook usage and particularly profile photos suggests the likelihood that users may be portraying more about themselves than they realize. The study by Kramer and Winter (2008), using a website very similar to Facebook in Germany provides a methodology for analyzing profile photos for evidence of this kind of behavior, and evidence that these photo characteristics are predictive of personality traits. For this study, I correlated these photo characteristics with three of the "Big Five" personality traits: extraversion (one's need to be with others), conscientiousness (one's level of organization and motivation), and emotional stability (one's sense of feeling calm and secure).

Hypothesis 1: Individuals who score high on extraversion are more likely to display a photo from a social scene. For example, Hussong (2003) found that social motives cause an increase in drinking among college students, particularly for extraverts, and this behavior may be more likely to show up in posted photos.

Hypothesis 2: Individuals who score low on conscientiousness are more likely to have a picture from a social scene. For example, Peluchette and Karl (2010) found that students would be less likely to post inappropriate pictures if they wished to be viewed as hardworking. Some less conscientious college students may not monitor their Facebook photos very closely and may not think about the consequences of posting an inappropriate

picture. Those individuals who wish to be seen as responsible and not careless may be less likely to select a profile photo from a social scene.

Hypothesis 3: Individuals who score high on emotional stability are less likely to frequently change their profile photo. Those who score low on emotional stability may be particularly self-conscious or need more validation through postings from "friends," which could cause them to frequently change their profile photo.

METHODOLOGY

Sample

The participants for this survey were members of the Class of 2014 at Bryant University. Our invitation to join the Bryant University Class of 2014 Facebook group was sent out to all 886 members of the class. Out of this group 312 students joined the group. All participants were therefore first year students at Bryant University ranging from age 18 to 20 (M=18.33, SD=.53). There were a total of 170 participants (55.88% male, 43.53% female, .59% not provided) who completed the survey. Our hypotheses were related to profile pictures, so analyses to test these hypotheses were limited to the 59 participants (71.19% male, 28.81% female) who gave us permission to view their Facebook profiles and who provided us with their Facebook identities. Of these 59 participants, four had privacy settings on their Facebook account that restricted viewing of previous profile pictures; for hypothesis three, which relates to the frequency of profile photo changes, the sample size was reduced to 55 (70.91% males, 29.09% females).

Measures

The survey began with an electronic consent form including a question asking if the participant was at least 18 years of age. The survey included questions from a standardized personality scale, specifically, the extraversion, conscientiousness, and emotional stability subscales taken from the Big 5 Mini Markers survey by Saucier (1994). This survey includes forty descriptive words and the participant must mark how accurately that adjective describes him/her on a scale from 1*(extremely inaccurate)* to 9*(extremely accurate)*. Each of the Big 5 personality traits has 8 descriptive words on the survey, some of which are positively

correlated and others that are negatively correlated. For each subscale, possible scores ranged from 8 (low trait score) to 72 (high trait score).

Next, participants were asked about their Facebook profile and usage. Specifically, participants were asked how long ago they created their Facebook account, why they created their account, how often they check their account, how many Facebook friends they have, what groups of people are included in their friends, how frequently they change their profile picture, how often they update their status, if they are in a romantic relationship, whether their relationship status is visible on their profile, how often they join groups or "like" pages suggested to them by friends, if they can access Facebook from a mobile device, and if they check their Facebook account more often than their email. At the end of the survey, we asked for participants' permission to view their profile, and asked them to provide their Facebook identity. This was done to allow us to link their personality measures to their profile pictures. If the participant gave his/her consent then the individual's profile picture was coded based on the coding scheme described by Kramer and Winter (2008). This scheme involved categorizing pictures based on style, face visibility, type of photo, location, looking at the camera and facial expression. In addition to Kramer and Winter's coding scheme, photos were also coded in terms of body visibility and the number of people in the picture, and several of the original dimensions were modified slightly. Finally, for participants with accessible privacy settings on their Facebook account, the number of previous profile pictures was recorded as a proxy measure of the frequency of picture changing.

Procedures

In order to distribute the survey to the Class of 2014 and connect the survey results to the Facebook profiles of the participants, a Facebook group was established for Bryant University's Class of 2014. The group is only for actual members of the class of 2014. The privacy settings were set to closed, which means that members of the group can be viewed by other users, but only members of the group can view any content in the group. Next, the survey was posted as an event specifically for the Bryant University Class of 2014 Facebook group. The event description showed up on the group's wall and all members, and only the members of the group, were invited to attend the event. Finally, an email was sent to all 885

members of the class of 2014 inviting them to join this new group on Facebook. The email informed the recipients that a new Facebook group had been created for their class and asked them to please join the group. It mentioned that this group would be surveyed as part of my Honors Capstone Project, but that it would also benefit the class as a whole during their remaining years at Bryant. The group has been able to serve many purposes for the members. Students have been able to utilize the group to buy and sell textbooks, promote on campus events, post surveys for their own projects, inform others about class delays and cancelations due to inclement weather, and post information about housing sign-ups for next year. Within twenty four hours of the email being sent out the group had over 200 members.

All questions on the survey were optional and could be skipped, except the initial page which asked whether the participant was at least 18 years of age and requested informed consent. After the survey was completed, we viewed the profiles of those participants who gave their Facebook identity and consent for their page to be viewed. When viewing their profiles I coded their profile pictures along the specified dimensions and recorded the number of previous profile pictures they have.

Analyzing the Results

For each participant, personality trait scores were computed for extraversion, conscientiousness, and emotional stability. Each of the three traits is correlated with eight items (see Table 1) and ratings were averaged across these items. Those attributes which are negatively correlated to the trait were reverse scored. For example, if the participant answered 4 *(slightly inaccurate)* for how accurately the word “shy” described him/herself then the answer was replaced with a 6 *(slightly accurate)* and averaged with all the other answers related to extraversion. The mean score ranged from 1 to 9, with 1 being a very low level of the trait and 9 being the highest. If a participant did not provide a score for each of the eight items for a given trait (i.e., extraversion, consciousness, or emotional stability) then they were not given an average score for that trait. For example, if a participant had not provided a score for “shy,” then his or her extraversion score would be left blank and the individual was omitted from any analyses involving that trait.

Extraversion	**Conscientiousness**	**Emotional Stability**
Talkative	Organized	Unenvious
Extroverted	Efficient	Relaxed
Bold	Systematic	Moody*
Energetic	Practical	Jealous*
Shy*	Disorganized*	Temperamental*
Quiet*	Sloppy*	Envious*
Bashful*	Inefficient*	Touchy*
Withdrawn*	Careless*	Fretful*

*Table 1. Specific attributes associated with Extraversion, Conscientiousness, and Emotional Stability, from the Big 5 Mini-Markers Survey (Saucier, 1994). *Indicates those items which are negatively correlated with the trait and were reverse scored.*

For participants who had given us permission to view their Facebook profile, I then coded his or her profile picture on a number of dimensions, including those taken from Kramer and Winter (2008) and several additional dimensions. Photos were assigned codes to categorize them based on the categories specified in Table 2. The number of previous profile pictures was also recorded. Each individual was assigned a unique participant number to allow matching of the survey results to the picture coding without recording names or other identifying information.

Coding Dimension	Dimension Categories
Style	• No photo • Potentially real photo of user • Different photo (e.g., symbol, character or image in place of personal photo)
Face Visibility	• No • Completely • Partly
Body Visibility	• Shoulders and up • Full body • Partly
Type of Photo	• Normal style (realistic color picture) • Different style (black and white, altered colors, graphically edited)
Location	• Portrait (location hardly visible) • Party (picture shows user at a party or at any other social scene) • Area (a lot of background is visible but not a party background)
(Facial) Expression	• Serious (similar to passport photograph) • Action/Candid (picture shows person during a certain activity such as sports or any other candid picture) • Posing (person strikes a pose, "model" style) • Normal Smile • Making a face
Looking at the Camera	• Yes • No
Number of People	• Only the user • The user and one other person • Group picture (3 or more people)

Table 2. Dimensions of Facebook Profile Photos

To test the three hypotheses I used two statistical methods. Independent samples t-tests were used to test whether extraversion and conscientiousness scores differ for those with profile pictures from a social scene and those without. A bivariate correlation was performed to test whether emotional stability scores are correlated with how frequently users change their profile picture. An alpha value of $p<.05$ was used to determine significance in all statistical tests.

Due to the fact that many participants were unwilling to allow us access to their profiles and photos, I also conducted a number of secondary analyses on the survey responses regarding

Facebook usage to determine whether there is any correlation between those factors and personality traits. For example, extraversion may be related to the number of contacts they have and how frequently they share new information with these contacts through changing their profile photo or updating their status. Similarly, conscientiousness may be related to Facebook contacts or "friends," specifically in terms of what groups of people the user accepts as a "friend." Emotional stability may be related to self-reported frequency of Facebook behaviors that involve monitoring and updating profiles (i.e., how frequently they check Facebook, change their profile picture, update their status, join groups, or "like" pages). Emotional stability may also be related to what personal information the user makes available to viewers, such as his or her relationship status. Gender was also used to segment the data and test for any differences between males and females.

RESULTS

While the sample size was substantially reduced for planned analyses involving Facebook profile pictures, the Facebook usage survey questions allowed us to run additional analyses using the full sample of 170. Testing our primary hypotheses and our secondary hypotheses resulted in relationships between each of the three primary personality traits (i.e., extraversion, conscientiousness, and emotional stability) and specific cues on users' Facebook profiles.

Extraversion

My first hypothesis was that individuals who score high on extraversion are more likely to display a photo from a social scene. This hypothesis was supported by the data. This was found to be significant using a two-tailed independent samples t-test comparing the participants with a party photo against those without a party picture, $t(52)= 2.69$, $p=.009$. Those with a party picture ($M=6.21$, $SD=1.15$) were more likely to have higher extraversion scores than those users who did not have a party profile picture ($M=5.26$, $SD=1.28$). To further test how the profile pictures relate to extraversion a one way ANOVA was used to test for a relationship between the number of people in the profile picture and the user's extraversion score. The overall test did not show a significant relationship, $F(2,51)=2.17$, $p=.12$. However, a contrast test showed a marginally significant difference between people

with profile pictures including one person (M=5.47, SD=1.36) versus people with profile photos with two or more people (M=6.16, SD=1.15), $t(51)= 1.96$, p=.056. Those students with higher extraversion scores were more likely to have a profile picture with at least one other person in it.

In addition to testing the relationship between extraversion and profile pictures, I also conducted additional analyses to determine whether other aspects of Facebook behavior provide cues about extraversion. Based on behaviors self-reported in the survey questions, I looked for relationships between extraversion and the following variables: how many friends they have, how often they report changing their profile picture, and how often they report updating their status.

Each of these Facebook behaviors was significantly correlated with extraversion. The most significant relationship was a positive correlation between extraversion and the number of friends the user reported having, $r(161)=.32$, $p<.001$. Not surprisingly, individuals with higher extraversion scores had more friends on Facebook. Extraversion also had a strong correlation with how frequently they report changing their profile picture, $r(161)=.22$, p =.005, and updating their status, $r(161)=.19$, p=.014. People scoring high on extraversion reported updating their status and changing their profile photo more frequently than people with lower scores.

Conscientiousness

The second hypothesis was that those who score low on conscientiousness will be more likely to have a profile picture with a party scene instead of other types of pictures. This relationship was tested by using a two-tailed independent samples t-test with an alpha value of .05, $t(53)=.10$, p=.92. There was no evidence to support this hypothesis. Those with party scenes (M=6.14, SD=1.24) were equally conscientious to those without party scenes (M=6.11, SD=1.13).

As with extraversion, I also conducted secondary analyses with self-reported Facebook behaviors from our survey questions to identify other possible cues that might reveal users' conscientiousness. In particular, I tested the possibility that conscientiousness might be

revealed by who the person is friends with on Facebook. More specifically, I hypothesized that Facebook users who include family, co-workers, and employers among their friends, not just high school or college peers, would have higher conscientiousness scores than those who exclude those relationships from Facebook. Table 3 shows the results of these comparisons. The relationship between conscientiousness and being Facebook friends with employers was shown to be marginally significant when using a two-tailed independent samples t-test with an alpha value of .05, $t(159)=1.78$, $p=.077$. There was no significant difference in conscientiousness for those who do or do not include family members, $t(159)=1.40$, $p=.16$, or co-workers, $t(159)=1.38$, $p=.17$, among their Facebook friends.

	Included among Facebook Friends *Mean (SD)*	Not Included among Facebook Friends *Mean (SD)*	*p* value
Family	6.43 (1.17)	6.06 (1.01)	0.16
Co-workers	6.49 (1.16)	6.24 (1.15)	0.17
Employers	6.71 (1.12)	6.30 (1.16)	0.08

Table 3. Comparison of conscientiousness scores for different categories of Facebook friends

Emotional Stability

The third hypothesis was that individuals who score high on emotional stability are less likely to frequently change their profile picture. To test this hypothesis I used a Pearson's Bivariate Correlation test to determine a correlation between conscientiousness and the number of previous profile pictures, $r(52)= -.14$, $p=.34$. There was no evidence to support this hypothesis.

The self-reported survey responses provided an alternative measure of the frequency of photo changing and other Facebook behaviors. I ran a series of analyses to test the relationship between emotional stability and how often users check Facebook, $r(163)= -.11$, $p=.17$, change their profile picture, $r(162)= -.10$, $p=.20$, join groups, $r(162)= -.10$, $p=.19$, or "like" pages suggested to them, $r(162)= -.02$, $p=.77$, and found that each of these correlations was non-significant. However, there was a significant negative correlation with the frequency of status updates and the user's emotional stability scores, $r(162)= -.19$, $p=.017$. People who are low on emotional stability (i.e., "neurotic") update their status more frequently.

Another self-reported behavior predicted to be a cue about users' emotional stability was their relationship status visibility. A highly significant 2 x 2 x 2 between-subjects factorial ANOVA, F (1,153) =20.78, p<.001, η_p^2=.09, revealed that relationship visibility is significantly related to emotional stability, but this relationship is moderated by relationship status (i.e., whether the individual is in a relationship or single) and gender (see Figure 1). Specifically, males who are in a relationship and have their relationship status visible have a significantly higher emotional stability score (M=6.31, SD=.85) than those who are in a relationship and do not have their status visible (M=4.21, SD=.81). For females, the pattern was reversed. Females who are in a relationship and have this information visible on their Facebook profiles have significantly lower emotional stability scores (M=4.93, SD=1.30) than those who are in a relationship and do not have it visible (M=6.05, SD=1.06). For users who were not in a relationship, there were no significant differences in emotional stability for relationship visibility, or gender. Emotional stability scores for males who have their single status visible (M=5.13, SD=1.29) were not significantly different from those who do not have their single status visible (M=5.66, SD=1.15). Likewise, emotional stability scores for females who have their single status visible (M=5.20, SD=1.16) were not significantly different from single females who do not have a status visible (M=5.02, SD=1.21).

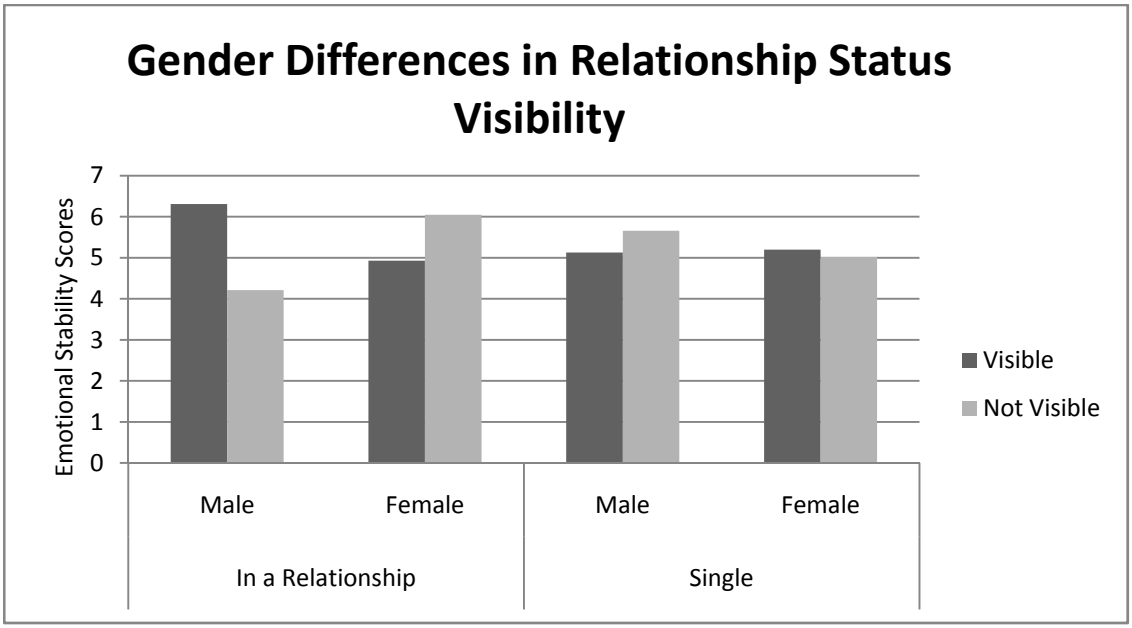

Figure 1 – Gender Differences in Relationship Status Visibility

DISCUSSION

My first hypothesis, that individuals who score high on extraversion are more likely to display a photo from a social scene, was supported by the profile pictures. Not only were extraverts more likely to have a profile picture from a party scene, but they were also more likely to have more people in their picture. The second hypothesis, that individuals who score low on conscientiousness are more likely to have a picture from a social scene, and the third hypothesis, that individuals who score high on emotional stability are less likely to frequently change their profile photo, were not supported. There was no evidence to support a relationship between conscientiousness and party scene profile pictures or between emotional stability and frequency of changing one's profile photo. The study had a relatively small sample size for the number of participants who completed the survey and an even smaller sample size for the number of participants who provided Facebook access. This could explain why I found limited evidence to support the general idea that Facebook profile pictures reveal information about the users' personalities.

While two of my three hypotheses regarding profile photos were not supported, I nevertheless found evidence that all three of these personality traits may be evident to Facebook users through behavioral cues. By expanding the data analysis to include the data from the Facebook usage questions on the survey, I was able to support a more general conclusion. Overall, Facebook profile information did provide viewers with important information about the user's personality. This study did not address whether the users are aware that viewers have access to information about their personality, or whether they are intentionally providing this information. However, I speculate that Facebook users might very well not realize that their profile picture, status updates, number of friends, types of friends, and relationship status are all revealing information about their personality. In particular, they are revealing their level of extraversion, conscientiousness and emotional stability.

As I had predicted, those users with higher extraversion scores were significantly more likely to have a profile picture of a social scene. Considering the low number of participants, this is a particularly robust finding. My secondary analyses also showed that extraversion was related to the number of Facebook friends users have and how frequently they change their

profile picture and update their status, all of which show an active social life and a desire to share this with others. The most significant relationship was between extraversion and the number of friends the user has. This highly significant relationship is not a surprise. Extraverted people easily make new friends in live interactions and it is not surprising that they would have more friends on a social networking website as well. The other two behaviors that had a significant relationship with extraversion were more counterintuitive. Perhaps extraverted students go out more with friends and take more pictures while out socializing. This gives them more pictures to upload or more pictures that their friends upload and tag them in. This more frequent supply of new pictures could account for the more frequent change in one's profile picture. Extraverts update their status more often because they are not shy and reserved. Instead, they enjoy sharing information with others.

The data did not support my prediction that conscientiousness would be expressed by whether the user had a profile picture from a party scene. I had expected conscientious users to be more selective over which picture they would choose to represent themselves online. I did not find evidence to support this. However, I also speculated that these users might be more selective about who they friend on Facebook. I had predicted that conscientious users would be more open to forming online friendships with family members, co-workers, and employers.

There was no significance found between conscientiousness and family members and co-workers. This could be a result of the very broad categories used in the survey. Family can consist of siblings and cousins around the same age. However, it can also extend to parents, aunts and uncles. "Friending" family members who are around the same age may be less threatening than "friending" older family members. Conscientiousness may be related to the "friending" of certain types of family members, but not others and the survey failed to distinguish between these types. Similarly, the survey may have failed to distinguish between different types of co-workers. For many college students, especially first-year students, co-workers usually include peers and friends. If a student previously worked at a grocery store, summer camp, or other part time job, then they were most likely working with other high school or college students, and therefore it's unlikely that "friending" them would be an indicator of conscientiousness. However, there was a relationship between conscientiousness

and being friends with employers. This category of friends is not as broad at the other two. Employers for students are not generally their peers and are seen as authority figures. Even if it is a low-wage, part-time summer job, it is still important to leave a good impression on employers to maintain one's job.

One last factor that could contribute to the null relationship between conscientiousness and "friending" family members and co-workers is that Facebook users can create increased privacy controls, in particularly for photos, for a select group of friends. The only picture that is visible to all their friends is their profile picture. So even those scoring low on conscientiousness may be willing to "friend" a range of social contacts, as long as they maintain some privacy restrictions. The role of privacy settings was not addressed in this study and could be researched further.

The third personality trait, emotional stability, was not correlated with how frequently users change their profile picture as I had originally predicted. I had predicted that they would change their profile picture more frequently due to their indecisiveness and instability. Selecting one photo to display to nearly all web users can be very stressful. For those with low emotional stability scores, perhaps their instability makes it very difficult to select one photo and this is why they do not change it more frequently than others.

However, emotional stability was correlated with two other Facebook behaviors. It correlated with the frequency of status updates and relationship visibility when moderated by relationship status and gender. Someone who is not a very emotionally stable person (i.e., neurotic) changes their status more often. This may reflect the changeability of thoughts and feelings, the desire to share those changes with others, or perhaps a need for validation from others' responses. If a user constantly changes their status, then the user appears more frequently on friends' newsfeeds. This causes more friends to "like" or comment on the status. This can make the user feel more significant and needed by their friends.

Whether someone is willing to display his or her relationship status can say a great deal about his or her personality. With this age group, many students have yet to have a significant romantic relationship and others have experience with many insignificant relationships. Being

in a relationship can be a comfort to many teenagers and some of them enjoy boasting to everyone that they are in a relationship, even if it is short-lived and not very serious. There are several factors which should be accounted for when determining a relationship between emotional stability and relationship status visibility on Facebook. This study revealed a very interesting effect between emotional stability and relationship status visibility when moderated by relationship status and gender. First of all, whether or not the user is in a relationship affects them showing their relationship status. Also, displaying one's relationship status was influenced by gender.

There is no relationship between emotional stability and relationship visibility if the user is not in a relationship. However, the relationship between emotional stability and relationship status visibility depends on gender for those users who are in a relationship. This relationship shows a very interesting difference between males and females when it comes to relationships, particularly at this young age. If a male is in a relationship and is willing to share this information with others, his emotional stability scores are higher. However, a female who does the same thing has personality scores that are less emotionally stable, and more neurotic. Females who disclose their relationship status have lower emotional stability scores. If a male is in a relationship and does not openly provide this information, then his personality scores are less emotionally stable and more neurotic. On the other hand, a female in a relationship who does not display her status on Facebook scores higher on emotional stability. This gender reversal may reflect double-standards and different social expectations regarding relationships and gender. Men are stereotyped as resistant to relationships, so a willingness to advertise a stable relationship may reflect confidence and a stable sense of self. Women, by contrast, are stereotyped as clingy and desperate for a relationship, and desperate to show it off to the world if she has one, so her choice to not advertise a relationship might reflect a similar confidence and sense of self.

As previously mentioned, the small sample size was a limitation of this study. On the other hand, the small sample size makes the few highly significant findings even more compelling, as they would likely hold true with a larger sample. Another limiting factor was that our participants were the result of self-selection. The participants had to make the decision to

allow access to their profiles. Those who did give permission might already have many personality traits in common. People who are willing to let others view their profile for a study might vary in personality from those who are not willing to do so. Once again gender can also play a role in making this decision. Our complete number of participants was 170 (55.88% male, 43.53% female, .59% not provided); when our sample was reduced to only those allowing us to view their profile the gender percentages shifted. The reduced sample size was 59 (70.91% males, 29.09% females). In spite of these drawbacks and the difficulty in testing relationships with profile photos, the exploratory analyses made it possible to use the full sample available to test the underlying hypothesis that Facebook behavior can provides cues about personality.

This study showed that Facebook behaviors do provide cues about the user's personality, but it did not address whether the viewers who see user's profiles and behaviors are sensitive to these cues. Future research could address whether viewers perceive these cues about the user's personality. Another aspect that was not tested in this study is whether users are aware of the image they are portraying and if so, whether they are intentionally displaying that personality. As previously mentioned, Peluchette and Karl (2010) found that many students intentionally misrepresent themselves to gain social acceptance. Students may realize that certain photos will relay a particular message to their viewers. Peluchette and Karl (2010) also found that students would be less likely to post inappropriate pictures if they wished to be viewed as hardworking and more likely to post them if they wished to be seen as sexually appealing, wild, or offensive. This attempt to be one of the "cool" kids may come with consequences in the future. These students may be able to speculate about future consequences of posting a picture from a college party. These findings show that some Facebook users are intentionally displaying certain images; however, it is still uncertain if all Facebook users intentionally display cues that will indicate specific personality traits. Future studies could test whether these potentially unintended images of the users' personalities could have unforeseen consequences in the future as well. This study found correlations between personality traits and Facebook cues for college freshmen. However, future studies could explore whether these relationships are maintained for other age groups.

CONCLUSION

In this study, I have established that Facebook profiles do provide many cues which tell viewers information about the user's personality. Social media is rapidly changing the way we interact with each other. Specifically, this new medium is affecting self–presentation and the process of impression management. Many first impressions are now formed through viewing Facebook profiles and other social media profiles. As these online relationships continue to increase it will be important for researchers to continue exploring how this new online self-presentation is connected to users' personalities.

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