

Are Close Friends the Enemy? Online Social Networks, Narcissism, and Self-Control

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Contribution Statement

This research demonstrates that using a social network can lead to the self absorbed, excessive self-esteem that leads to narcissism. In seven studies, we show that browsing a social network leads people to adopt a narcissistic mindset. This narcissistic mindset remains active after social network use, making people more likely to display narcissistic tendencies, such as self indulgent behavior and poor self-control, after browsing a social network compared to not browsing a social network. To the best of our knowledge, this is the first research to demonstrate that using online social networks can influence self-control. Additionally, our findings show that narcissism, which is typically conceptualized as a personality trait, may also be a state that can be activated by situational factors. This research also has important implications for policy makers because self-control is one of the most powerful mechanisms for maintaining social order and well-being.

Abstract

Online social networks are used by hundreds of millions of people every day, but little is known about their effect on behavior. In seven studies, we demonstrate that social network use leads people to adopt a narcissistic mindset. This mindset remains active after social network use such that people show narcissistic tendencies after they have logged-off the social network. Specifically, we show that having people browse a social network leads them to subsequently display poor self-control and to report higher levels of narcissism. Additionally, we present evidence suggesting that greater social network use is associated with a higher body-mass index, increased binge eating, a lower credit score and higher levels of credit card debt for individuals with strong ties to their social network.

Online social networks are having a fundamental and important influence on society. Facebook, the world's largest online social network, had over 850 million active users by early 2012, with 70% from outside the United States (www.facebook.com 2012). The success of social networks, however, is based not only on the numbers of active users, but also on the amount of time users spend on these websites. Online social network use accounts for nearly 23% of time spent online in the United States, which is approximately double the time spent on any other online activity (Nielsen 2010). Further, people now spend over 700 billion minutes per month on Facebook alone (www.facebook.com 2012). Despite their growing popularity and increasingly frequent usage, a systematic understanding of how social network use affects consumer behavior remains elusive. Does social network use, for instance, impact the choices consumers make in their daily lives? If so, what effect does their use have on consumers' well-being?

People use social networks to fulfill a variety of social needs, including self-expression and self-presentation (Back et al. 2010; Gosling, Gaddis, and Vazire 2007). Consequently, using a social network can enhance self-esteem and positively affect well-being (Gonzales and Hancock 2011; Valkenburg, Peter, and Schouten 2006). We propose that while social network use does make people feel better about themselves, these increased feelings of self-worth can have a detrimental effect on behavior. We argue that, because people present an inflated self-image to others on social networks, using a social network leads to the self absorbed, excessive self-esteem that characterizes narcissism. Specifically, this excessive self-esteem leads people to adopt a narcissistic mindset, making them more likely to display narcissistic tendencies, such as self-indulgent behavior and poor self-control, after browsing a social network compared to not browsing a social network. Additionally, we show that because people care more about the image they present to close friends in their social network (i.e., strong ties), these effects emerge

primarily in social network users who are focused on strong ties while browsing their social network.

This research makes a number of contributions. To the best of our knowledge, this is the first research to demonstrate that using online social networks can influence self-control. Additionally, our findings show that narcissism, which is typically conceptualized as a personality trait, may also be a state that can be activated by situational factors. This research also has important implications for policy makers because self-control is one of the most powerful mechanisms for maintaining social order and well-being (Tangney, Baumeister, and Boone 2004). Given the ubiquity of online social networks, their ability to lower users' self-control could have widespread impact. This may be particularly true for the current generation of adolescents and young adults who are the heaviest users of social networks.

SOCIAL NETWORKS AND NARCISSISM

The Psychology of Social Network Use

Online social networks are used by hundreds of millions of people every day to communicate and share experiences with others. They have become a vital tool for connecting people and sharing information. Social networks let people create profiles containing information about themselves (e.g., pictures, interests, and personal information) and connect to others in order to expand their personal networks. They have become a vital tool for building friendships and maintaining family relationships by allowing people to easily share personal thoughts, pictures, and accomplishments. Additionally, "status updates" and "tweets" let people share glimpses into their daily lives with others (Worthan 2011).

From a motivational perspective, people use social networks to fulfill a variety of social needs, including affiliation, self-expression, and self-presentation (Back et al. 2010; Gosling et al. 2007; Toubia and Stephen 2012). Thus, social network use can have a positive effect on how people feel about themselves and their well-being. When adolescents receive positive feedback on their social network profile, it enhances their self-esteem and well-being (Valkenburg et al. 2006). People who are typically low in life satisfaction enjoy a number of positive social benefits from using social networks (Ellison, Steinfield and Lampe 2007), such as increased social capital. Emotionally unstable individuals rely on social networks for social support and to repair well-being after negative emotional experiences (Buechel and Berger 2012).

Importantly, people tend to share positive information about themselves to others on social networks (Gonzales and Hancock 2011). Although not all information about users is positive, social networks offer a number of features that allow users to control what information is shared with their network. For instance, if an unflattering picture is posted on Facebook, a user can hide the picture from his or her network. Similarly, they can delete “status updates” that they have second thoughts about (e.g., pictures from a late night out). In other words, social networks provide people with the ability to selectively present what they want others to see. Consequently, simply browsing a social network has been shown to momentarily increase users’ self-esteem (Gonzales and Hancock 2011). In contrast, this effect is not observed when people look at themselves in a mirror.

The Narcissistic Mindset

High levels of self-esteem are associated with a number of positive social behaviors, but there also is a “dark side” to high self-esteem, particularly when it comes in the form of

narcissism (Bushman and Baumeister 1998). Narcissism is typically conceptualized as a personality trait, characterized by high self-esteem, which is associated with a number of antisocial behaviors. What distinguishes narcissists from others with high self-esteem is that they maintain excessive self-esteem. While most people hold relatively accurate self-appraisals, narcissists hold unrealistically high self-appraisals, which results in sense of superiority and an elevated sense of self-worth (Bushman and Baumeister 1998). This excessive self-esteem makes narcissists more prone to aggression, self-indulgence and low self-control (Bushman and Baumeister 1998; Vazire and Funder 2006). For instance, narcissism is associated with gambling problems (Lakey et al. 2008) and greater compulsive consumption (Rose 2007). Additionally, narcissists are more likely to display impulsive and irrational behaviors in response to ego threats (Bushman and Baumeister 1998).

Evidence suggests that excessive self-esteem is not limited to chronic personality traits, but can be activated by situational factors. For instance, alcohol consumption tends to artificially increase self-esteem, leading people to rate themselves higher on a number of traits after consuming alcohol (Banaji and Steele 1989; Diamond and Wilsnack 1978); alcohol consumption has been linked to a number of negative behaviors including aggression and poor self-control (Bushman and Cooper 1990; Steele and Josephs 1990). Additionally, consumer research has demonstrated that elevated feelings of self-worth can lead to more impulsive or indulgent behavior. Khan and Dhar (2006) find that a prior virtuous act can momentarily boost the self-concept, which leads to more self-indulgence in unrelated decisions. Similarly, Wilcox, Kramer, and Sen (2011) show that increased feelings of pride, which is associated with greater self-esteem, results in more indulgent choices in subsequent tasks that are unrelated to the source of

pride. However, these studies did not examine the direct relationship between consumers' self-esteem and their self-control.

Consistent with previous research (Gonzales and Hancock 2011), we also propose that the use of social networks will increase self-esteem because social networks facilitate self-presentation. However, because people present an inflated self-image to others in their network, we argue that using a social network leads to the excessive form of self-esteem that characterizes narcissism. Thus, browsing a social network will lead people to adopt a narcissistic mindset. This narcissistic mindset will remain active after social network use and affect behavior after users have logged-off the network. We therefore predict that people will be more likely to display narcissistic tendencies, such as greater self-indulgence and poor self-control, after browsing a social network compared to those that did not browse a social network. Next, we discuss the role that tie strength plays as a moderator of this hypothesized effect of social network use on self-esteem and narcissistic behavior.

Tie strength and Self-Presentation

Social networks differ in terms of the strength of users' connections to their friends on the network, which is often referred to as tie strength (Granovetter 1973). More generally, the concept of tie strength captures the degree to which one is more or less involved in a given social relation, feels close to that person, and values that relation. Strong ties are typically friends with whom people share a personal connection, whereas weak ties are acquaintances with whom people have more distant relationships (Ryu and Feick 2007). Accordingly, strong ties are closer social relations than weak ties. Although social networks make it easier to connect with both weak and strong ties, information flow within any given social network (offline or online) often

depends less on the number of ties (i.e., the number of friends) than on the strength of those ties (Frenzen and Nakamoto 1993). For instance, people with a small number of strong ties can transmit information more effectively than people with a high number of weak ties (Granovetter 1973).

One important characteristic of strong ties is that they have greater influence over their network of friends than weak ties (Brown and Reingen 1987). Not surprisingly, people are more highly involved with and more actively attend to friends who are strong ties. Consequently, people tend to be more concerned about the image they present to strong ties than to weak ties (Sudman et al. 1994). Additionally, people rely on social networks and personal websites as ways to gain the approval of close friends and family (Schau and Gilly 2003). Thus, if social network use leads to excessive self-esteem through self-presentation, this effect should be strongest for those who are more closely connected to their network. This implies that the effect should be strongest for those with higher proportions of strong tie friends among their sets of social contacts. Further, the more focused people are on strong ties while browsing a social network, the more likely they are to care about the image they are presenting to others in their network. Thus, social network usage should only trigger the narcissistic mindset when users are focused on strong ties in the network. Consequently, we predict that social network use will result in a narcissistic mindset primarily for those focused on strong ties while they are browsing the network. We do not expect social network use to influence those focused on weak ties because they should care less about the image they are presenting to others in their network (i.e., the people they are presenting themselves to are less important to them).

Next, we present the results of seven studies examining the relationship between social network use, self-esteem and narcissism. Because of the importance of self-control to consumer

behavior, we initially focus on the relationship between social network use and performance in tasks requiring self regulation. We then provide direct evidence that social network use leads to the excessive self-esteem that leads to narcissism.

STUDY 1A

In studies 1A and 1B, we examine how social network use affects consumers' ability to exercise self-control in the context of spending restraint (study 1a) and exerting effort in mentally challenging tasks (study 1b; Vohs and Heatherton 2000). We had people browse either Facebook or a popular news website before administering self-control task. We expected participants focused on strong ties to display less self-control after having browsed Facebook compared to those that did not browse Facebook.

Method

Participants and design. Seventy-eight Facebook users from a U.S. panel participated in the study ($M_{Age} = 33.61$; 54% Female). Participants were randomly assigned to one of two conditions (Browsing: Facebook vs. No Facebook) in the between-subjects design.

Procedure. The study was conducted in three parts that were disguised as unrelated studies. The first part was designed to assess Internet use. After answering several general questions about their Internet use, participants indicated how many friends they had on Facebook and how close they were to their Facebook friends, which served as a measure of how focused they are on close friends during the browsing experience. Specifically, they indicated the percentage of their Facebook friends they considered to be very close friends, somewhat close friends, acquaintances, distant acquaintances and strangers (i.e., people they did not know offline

at all). We added the percentage of friends considered to be very close and somewhat close to create a measure of tie strength. Thus, higher numbers corresponded to people with a Facebook network comprised of a higher proportion of strong-tie friends. This means that participants with higher scores on this variable would necessarily be more focused on strong ties friends when browsing Facebook. We selected this tie strength measure as opposed to alternatives (e.g., total number of close friends) for four reasons. First, recording the percentage of close friends is a standard way to measure the strength of people's connections to their social networks (Marsden and Campbell 1984). Second, when people browse Facebook, the website is populated with information about both strong and weak ties. How much of this information will be related to close friends should be determined by the proportion of close friends in a users' network. Third, due to algorithms determining how Facebook (and similar social networks) displays information, in any given browsing session it is highly unlikely that a user will be exposed to all of his or her network. Thus, the number of close friends one has or a related network size measure is not appropriate. Instead, the proportion of one's contacts who are deemed to be close or very close is more appropriate. Finally, we validated our measure with a pretest (see below).

Next, participants were administered a website viewing task. In the Facebook condition, participants logged into their personal Facebook accounts and browsed the website for five minutes. They were instructed to avoid interacting with their friends or posting content such as "status updates." Rather, they were instructed to just read their "news feed" while logged into Facebook. This allows for a cleaner comparison between the Facebook and No Facebook groups since participants in both conditions simply browsed a website, with the major difference being the nature of the content to which they were exposed (i.e., socially relevant information vs. news information). In the No Facebook condition, participants browsed the popular news website

CNN.com for five minutes. All participants were instructed that they would be asked questions about the task later in the session to ensure that they were sufficiently engaged. After five minutes, a button appeared on the screen that allowed them to continue to the next purportedly unrelated study. There was no significant difference in the amount of time spent browsing between conditions.

In the final task, participants were administered an iPad valuation study. Participants were informed that the purpose of the study was to understand how people value the Apple iPad 2. They were further instructed that the study would be a real auction for the current 64GB 3G version of the iPad 2 (\$829.99 retail value) involving actual money. The auction was a single bid silent auction where the highest bidder would then purchase the iPad at the value of their winning bid. They were further instructed that the winning bidder would be notified by email to complete the purchase online. During the auction, participants were shown a picture and given a brief description of the iPad. After reviewing the information, they were reminded that they could submit only one bid and that the highest bid would purchase the iPad at the amount of their winning bid. They were then prompted to enter a bid. We recorded their willingness to pay for the iPad as a measure of spending control, which is consistent with previous research (Fujita et al. 2006). Afterwards, participants indicated their household's annual income (in seven categories) and their attitude towards Apple (1 = "Not like at all" and 7 = "Like a lot"). After one week, the winner was notified via email and given instructions about how to complete the purchase.

Results

Pretest. Fifty-three Facebook users from the same panel as the main study participated in a pretest designed to validate our measure of tie strength. Specifically, we sought to show that people with a higher proportion of strong ties in their network would be more focused on strong ties during their browsing experience. First, participants completed the same internet survey from the main study, which allowed us to measure the number of Facebook friends and tie strength. All participants then browsed Facebook for five minutes. Afterwards, they indicated the extent to which they agreed (1 = “Strongly Disagree”, 7 = “Strong Agree”) with three statements about the browsing task that were averaged together to form a measure of closeness (“I thought about my close friends”, “I thought about friends whose opinions matter”, “I thought about friends who are influential to me”; $\alpha = .83$). The correlation between number of friends and tie strength was insignificant ($r = -.21$; NS). We examined the relationship between tie strength and closeness using regression with closeness as the dependent variable, and tie strength, number of Facebook friends and their interaction as independent variables. As expected, tie strength was a significant predictor of closeness ($\beta = .02$, $t(49) = 2.87$, $p < .01$). Those with a higher proportion of strong ties in their network were more focused on close friends while browsing Facebook. The effects of number of Facebook friends ($\beta = .01$, $t(49) = 1.02$, NS) and the friends by tie strength interaction ($\beta = .01$, $t(49) = .92$, NS) were not significant.

Effect of social network use on spending. We tested our predictions by estimating a regression of spending (measured using participant’s auction bids) on browsing, mean-centered tie strength, and their interaction. Browsing was coded using contrast coding equivalent to 1 if the participant browsed Facebook and -1 if the participant browsed CNN.com. Number of Facebook friends ($\beta = .23$, $t(71) = 1.95$, $p < .10$), income ($\beta = 5.79$, $t(71) = .45$, NS) and attitude towards Apple ($\beta = 22.50$, $t(71) = 1.69$, $p < .10$) were included as covariates. The tie strength by

browsing interaction was significant ($\beta = 1.76$, $t(71) = 2.03$, $p < .05$). To explore the interaction, we examined the effect of browsing on those with strong ties and weak ties by centering tie strength at one standard deviation above and below the mean (Aiken and West 1991). As depicted in figure 1a, browsing Facebook increased spending for those with strong ties ($\beta = 86.52$, $t(71) = 2.46$, $p < .05$). In contrast, browsing Facebook did not significantly affect spending for those with weak ties ($\beta = -19.30$, $t(71) = -.54$, NS).

STUDY 1B

Method

Participants and design. Two hundred-forty Facebook users from a U.S. panel participated in the study ($M_{\text{Age}} = 35.04$; 58% Female). Participants were randomly assigned to one of two conditions (Browsing: Facebook vs. No Facebook) in the between-subjects design.

Procedure. The study was conducted in three parts that were disguised as unrelated studies. In the first part, participants were administered an Internet use study where they indicated how many friends they had on Facebook and how close they are to their Facebook friends, which served as a measure of tie strength. In the second part, participants were administered the same website viewing task from study 1A. After browsing CNN.com or Facebook for five minutes, participants were administered a mentally challenging task. Specifically, they were informed that the purpose of this final task was to develop a short version of the IQ Test. Because it was a short version, they would only have two minutes to answer all of the questions. Participants were then administered ten IQ Test questions to answer. After two minutes, they were automatically brought to the next screen. We recorded the number of correct answers in two minutes as a measure of task performance.

Results

We tested our predictions by estimating a regression of correct answers on browsing, mean-centered tie strength, and their interaction. Browsing was coded using contrast coding equivalent to 1 if the participant browsed Facebook and -1 if the participant browsed CNN.com. Number of Facebook friends ($\beta = .01$, $t(235) = .05$, NS) was included as a covariate. The tie strength by browsing interaction was significant ($\beta = -.01$, $t(235) = -3.03$, $p < .01$). We examined the effect of browsing on those with strong ties and weak ties by centering tie strength at one standard deviation above and below the mean (Aiken and West 1991). As depicted in figure 1b, browsing Facebook resulted in fewer answers correct for those with strong ties ($\beta = -.38$, $t(235) = -2.79$, $p < .01$). Browsing Facebook did not significantly affect performance on the test for those with weak ties ($\beta = .21$, $t(235) = 1.59$, NS).

Discussion

The results of the studies 1A and 1B provide initial support for our hypothesis that online social network use can lower self-control. Specifically, participants with strong ties submitted higher bids in an actual auction (study 1a) and performed worse at a mentally challenging task (study 1b) after browsing Facebook compared to browsing CNN.com. Browsing Facebook (vs. CNN.com) did not significantly affect self-control for those with weak ties. The next studies provide evidence that the results are due to enhanced self-esteem.

STUDY 2A

In study 2A, we examined how browsing Facebook influences the likelihood of making an unhealthy food choice. Additionally, we measured self-esteem to demonstrate that browsing a social network lowers self-control by increasing self-esteem. Finally, we tested an alternative explanation for the findings. Previous research demonstrates that greater emotional arousal can result in depletion (Fedorikhin and Patrick 2010). It is possible that browsing a social network may lower self-control via depletion rather than by increasing self-esteem as we propose. Consequently, we measured arousal after people made their choice to rule this out as a possibility.

Method

Participants and design. Eighty-four Facebook users from a U.S. panel participated in the study ($M_{Age} = 34.67$; 58% Female). Participants were randomly assigned to one of two conditions (Browsing: Facebook vs. No Facebook) in a between-subjects design.

Procedure. The study was conducted in three parts that were disguised as unrelated studies. The first two parts were the same Internet use survey and website viewing task as previous studies, which allowed us to measure tie strength and manipulate Facebook use respectively. The final part was a consumer products study that involved various consumer choices. The first decision was a food choice that served as a measure of self-control. Specifically, participants were asked to choose between two pre-tested snack alternatives: a healthy option (a granola bar) and an unhealthy option (chocolate chip cookies). They were instructed that each option costs the same amount of money. We recorded preference for the unhealthy cookies as a measure of self-control with greater preference for the cookies corresponding to lower self-control. After making their choice, participants completed a three-

item reduced version of the Rosenberg (1989) self-esteem scale (“I have a positive attitude toward myself”, “At times I think I am no good at all”, “I certainly feel useless at times”; $\alpha = .72$). Additionally, they completed a two-item arousal scale (1 = “Not aroused”, 7 = “Aroused”; 1 = “Not stimulated”, 7 = Stimulated”; $r = .70$). The presentation order of the self-esteem and arousal scales was counterbalanced. Finally, participants indicated how healthy they perceived the two food options to be (1 = “Very unhealthy” and 7 = “Very healthy”).

Results

Choice set validation. As anticipated, participants perceived the granola bar to be a significantly healthier option than the bag of cookies ($M_{\text{Granola}} = 4.81$; $M_{\text{Cookies}} = 2.17$; $t(83) = 15.48, p < .001$).

Effect of social network use on unhealthy choice. Logistic regression was used to test our key predictions. The dependent variable was unhealthy choice, coded as 1 if a participant selected the cookies, and 0 if they selected the granola bar. Browsing was coded using contrast coding equivalent to 1 if the participant browsed Facebook and -1 if the participant browsed CNN.com. Browsing, mean-centered tie strength, and the interaction between browsing and tie strength were included as predictors. Number of Facebook friends was included as a covariate, but did not significantly affect unhealthy choice ($\beta = .01, \chi^2(1) = .01, \text{NS}$).

The tie strength by browsing interaction was significant ($\beta = .04, \chi^2(1) = 6.07, p < .05$). To explore the interaction, we examined the effect of browsing on those with strong ties and weak ties by centering tie strength at one standard deviation above and below the mean (Aiken and West 1991). As depicted in figure 2a, browsing Facebook increased the likelihood of making an unhealthy choice for those with strong ties ($\beta = 1.35, \chi^2(1) = 9.06, p < .01$). In contrast,

browsing Facebook did not significantly affect the likelihood of making an unhealthy choice for those with weak ties ($\beta = -.08$, $\chi^2(1) = .10$, NS).

Facebook use and self-esteem. We analyzed self-esteem using regression with browsing, mean-centered tie strength, and the interaction between browsing and tie strength as the independent predictors. Number of Facebook friends was included as a covariate, but did not significantly affect self-esteem ($\beta = .01$, $t(79) = -.38$, NS). The tie strength by browsing interaction on self-esteem was significant ($\beta = .01$, $t(79) = 3.73$, $p < .001$). To examine the effect of browsing on the self-esteem of those with strong ties we reran the above analysis with tie strength centered at one standard deviation above the mean. Browsing Facebook increased self-esteem for those with strong ties compared to browsing CNN.com ($\beta = .34$, $t(79) = 3.72$, $p < .001$). Browsing Facebook did not significantly affect self-esteem for those with weak ties ($\beta = -.16$, $t(79) = -1.62$, NS).

Facebook use and arousal. The arousal measure was regressed on browsing, mean-centered tie strength, and their interaction. Number of Facebook friends ($\beta = -.01$, $t(79) = -1.12$, NS) was included as a covariate. However, the effects of browsing ($\beta = .11$, $t(79) = .75$, NS), tie strength ($\beta = .01$, $t(79) = .53$, NS) and their interactions ($\beta = .01$, $t(79) = .18$, NS) were not significant. Thus, browsing Facebook affects self-esteem, but not arousal.

Mediation. We tested whether self-esteem mediates the effect of browsing on the likelihood of making an unhealthy choice in a moderated mediation analysis proposed by Preacher, Rucker, and Hayes (2007; model 2). First, we assigned self-esteem as the mediator, browsing as the independent variable and number of Facebook friends as a covariate. To test whether self-esteem mediated for those with strong ties, we centered tie strength at one standard deviation above the mean and included tie strength and the tie strength by browsing interaction

as covariates. The effect of browsing on self-esteem was significant ($\beta = .44, t(78) = 3.72, p < .001$). Additionally, self-esteem predicted unhealthy choice ($\beta = .85, \chi^2(1) = 5.15, p < .05$). The direct effect of browsing on unhealthy choice was reduced ($\beta = 1.07, \chi^2(1) = 4.91, p < .05$) from the total effect of browsing on unhealthy choice ($\beta = 1.35, \chi^2(1) = 3.01, p < .01$). Importantly, the bootstrap analysis shows that the indirect effect of browsing on unhealthy choice was positive and significant (95% confidence interval excluded zero; indirect effect = .37; 95% CI: .03 to .86), which supports mediation for those with strong ties. For those with weak ties, we reran the above analysis with tie strength centered at one standard deviation below the mean. The indirect effect of browsing on unhealthy choice was negative and insignificant (95% confidence interval included zero; indirect effect = -.16; 95% CI: -.56 to .04), and therefore does not support mediation for those with weak ties.

STUDY 2B

In study 2B, we examined how Facebook use influences persistence in a mentally challenging task. We expected that people with strong ties would show less persistence at the task after browsing Facebook compared to those that did not browse Facebook. Additionally, we measured self-esteem to provide additional evidence that browsing a social network lowers self-control by increasing feelings of self-worth. Finally, we wanted to test another alternative explanation. When people use social networks they spend a significant amount of time reading postings (i.e., status updates) that contain other people's feelings, thoughts and activities (Worthan 2011). Thus, by focusing users on others, and away from the self, browsing a social network may reduce self-awareness, which would lower self-control. Additionally, this effect would likely be strongest for people that have a close connection to the "others" in their network

since they are expected to pay more attention to them and be generally more interested in their lives documented in the social network. Thus, we also measured self-awareness to rule this out as a possibility.

Method

Participants and design. Eighty-eight undergraduates ($M_{\text{Age}} = 19.52$; 56% Female) participated in the study. Participants were randomly assigned to one of the two conditions (Browsing: Facebook vs. No Facebook) in the between-subjects design.

Procedure. The study was conducted in a behavioral lab with a procedure that was nearly identical to previous studies, with a few notable exceptions. First, after completing the Internet use survey that measured tie strength (before the website browsing task) participants were administered an unrelated filler study that lasted for approximately 20 minutes. This was done to minimize the possibility that our measurement of tie strength influenced how people responded to browsing Facebook. Additionally, after the browsing task, participants were administered a block of ten anagrams to solve, as part of an unrelated pretest for the future study, of which 90% were unsolvable. Consistent with prior research (Vohs and Heatherton 2000), we recorded persistence with the task, measured by how long it took before people gave up (in seconds), as a measure of self-control with longer times corresponding to greater self-control.

After the anagram task, participants completed the Situational Self Awareness Scale (Govern and Marsch 2001), which contains a three-item public self-awareness subscale ($\alpha = .76$), a three-item private self-awareness subscale ($\alpha = .81$) and a three-item environmental self-awareness subscale ($\alpha = .76$). Additionally, they completed the same a three-item reduced version of the Rosenberg (1989) self-esteem scale from study 2A ($\alpha = .73$).

Results

Regression was used to test our predictions. The key dependent variable was task persistence, which was measured as the length of time before people gave up on the task. Browsing was coded using contrast coding equivalent to 1 if the participant browsed Facebook and -1 if the participant browsed CNN.com. Browsing, mean-centered tie strength, and the interaction between browsing and tie strength were included as independent predictors. Number of Facebook friends was included as a covariate, but did not significantly affect task persistence ($\beta = -.02$, $t(83) = -.94$, NS).

Facebook use and task persistence. Consistent with previous studies, the tie strength by Facebook interaction was significant ($\beta = -.95$, $t(83) = -2.41$, $p < .05$). To examine the effect of browsing on persistence for those with strong ties we reran the above analysis with tie strength centered at one standard deviation above the mean. As depicted in figure 2b, browsing Facebook decreased persistence for those with strong ties compared to browsing CNN.com ($\beta = -32.74$, $t(83) = -2.43$, $p < .05$). An equivalent analysis with tie strength centered at one standard deviation below the mean found that browsing Facebook did not significantly affect task persistence compared to browsing CNN.com for those with weak ties ($\beta = 12.43$, $t(83) = 1.02$, NS). Thus, the results are consistent with previous studies using a more general measure of self-control.

Facebook use and self-esteem. We analyzed self-esteem using regression with browsing, mean-centered tie strength, and the interaction between browsing and tie strength as the independent predictors. Number of Facebook friends was included as a covariate, but did not significantly affect self-esteem ($\beta = -.08$, $t(83) = 1.09$, NS). The tie strength by browsing

interaction on self-esteem was significant ($\beta = .01$, $t(83) = -2.24$, $p < .05$). To examine the effect of browsing on the self-esteem of those with strong ties we reran the above analysis with tie strength centered at one standard deviation above the mean. Browsing Facebook increased self-esteem for those with strong ties compared to browsing CNN.com ($\beta = .25$, $t(83) = 2.26$, $p < .05$). An equivalent analysis with tie strength centered at one standard deviation below the mean found that browsing Facebook did not significantly affect task persistence compared to browsing CNN.com for those with weak ties ($\beta = -.09$, $t(83) = -.93$, NS).

Facebook use and self-awareness. The three self-awareness measures were each regressed on browsing, mean-centered tie strength, and their interaction. However, the effects of browsing, tie strength and their interactions in each model did not reach significance. Thus, it appears that browsing Facebook affects self-esteem, but it does not influence self-awareness.

Mediation. We tested for moderated mediation analysis follow the procedure proposed by Preacher, Rucker, and Hayes (2007; model 2). The analysis shows that the browsing by tie strength interaction predicted self-esteem ($\beta = .01$, $p < .05$). When self-esteem was added to the dependent variable model, it significantly predicted task persistence ($\beta = -.49.64$, $p < .001$) while the browsing by tie strength interaction did not ($\beta = -.53$, NS). Conditional indirect effects analyses using a bootstrap method supported our theory. Specifically, the analyses revealed that self-esteem mediated the effect of browsing when participants had strong ties to their friends ($z = 0.97$, $p < .05$), but self-esteem did not mediate the effect of browsing when participants had weak ties to their friends ($z = .84$, NS).

Discussion

The results of studies 2A and 2B provide additional support for the finding that social networks decrease self-control by enhancing self-esteem for those focused on strong ties while browsing the network. One limitation of our findings is that we have used the same control group (i.e., browsing CNN.com) in all of our studies. Thus, it is possible that there is something about browsing CNN.com that could affect the results. To rule this out as a possibility, we reran study 2B with a different control condition. Specifically, we had people browse Facebook or browse TMZ.com, a celebrity news and gossip website that is more social than CNN.com but not a social network in the sense of Facebook. The results of this follow-up study fully replicate those of study 2B.

STUDY 3

Studies 2A and 2B demonstrate that social network use increases self-esteem for those focused on strong ties. The primary purpose of study 3 was to show that these increased feelings of self-worth represent the excessive form of self-esteem that results in narcissism. Specifically, we had people browse a social network before having them complete a narcissistic personality measure. We expected those focused on strong ties to report higher levels of narcissism after browsing a social network and this effect to be mediated by self-esteem. Additionally, instead of measuring tie strength, we manipulated people's focus on strong versus weak ties prior to having them browse social network. Finally, to rule out the possibility that our results are due to simply priming Facebook, we had participants write about the experience of browsing Facebook without actually browsing it in the No Facebook (i.e., control) condition. Thus, all participants were focused on Facebook in this study, but only half actually browsed the social network.

Method

Participants and design. One-hundred Facebook users from a U.S. panel participated in the study ($M_{Age} = 32.30$; 57% Female). Participants were randomly assigned to one of four conditions in the 2(Browsing: Facebook vs. No Facebook) by 2(Tie strength: Strong vs. Weak) between-subjects design.

Procedure. The procedure was similar to that of previous studies with a few notable exceptions. As in previous studies, participants were administered an internet use survey, which allowed us to measure the number of friends they have on Facebook. Participants were then given a name listing task, which served as a manipulation of tie strength. In the strong tie strength condition, participants were asked to list the names of five friends they have on Facebook who they considered to be close friends. For each friend, they were then asked to indicate how much the person's opinion mattered to them (1 = "Opinion does not matter at all", 7 = "Opinion matters a lot"). In the weak tie strength condition, participants were asked to list the names of five friends on Facebook who they considered to be distant friends and, for each friend, to indicate how much the person's opinion mattered to them.

In the Facebook condition, participants then browsed Facebook for five minutes. In the No Facebook condition, participants wrote for five minutes about the experience of browsing Facebook. Afterwards, all participants were administered the 40-item Narcissistic Personality Inventory (NPI; Raskin and Terry 1988; $\alpha = .81$), which measures the excessive self-appraisals that characterize narcissism (e.g., "I will be a success", "I am going to be a great person", "I am an extraordinary person"). Participants then completed the same three-item reduced self-esteem scale from study 2 ($\alpha = .74$) and indicated how focused they were on close friends during the Facebook task ("I thought about my close friends", "I thought about friends whose opinions

matter”, “I thought about friends who are influential to me”; $\alpha = .95$). Finally, they were asked to indicate the extent to which they agreed (1 = “Strongly Disagree”, 7 = “Strong Agree”) that they were focused on Facebook during the study.

Results

Manipulation checks. We examined how focused people were on close friends using ANOVA with browsing and tie strength as the factors and number of Facebook friends as a covariate. As expected, there was a main effect of tie strength and no significant interaction ($F(1, 95) = .01$; NS). As intended, those in the strong tie condition were more focused on close friends compared to those in the weak tie condition ($M_{\text{Strong}} = 5.46$; $M_{\text{Weak}} = 4.86$; $F(1, 95) = 5.48$; $p < .05$). We examined how focused participants were on Facebook using the same model. The main effects of tie strength ($F(1, 95) = .57$; NS), browsing ($F(1, 95) = .32$; NS) and their interaction ($F(1, 95) = .20$; NS) were insignificant. Thus, there is no evidence that the participants who browsed Facebook were more focused on Facebook than those who merely wrote about browsing Facebook in the control condition.

Facebook use and narcissism. We examined narcissism using ANOVA with browsing and tie strength as the factors and number of Facebook friends as a covariate. The browsing by tie strength interaction was significant ($F(1, 95) = 4.35$; $p < .05$; see figure 3a). As expected, those in the strong tie condition reported higher levels of narcissism after browsing Facebook compared to those that did not browse Facebook ($M_{\text{Facebook}} = 17.92$; $M_{\text{NoFacebook}} = 13.29$; $F(1, 95) = 6.45$; $p < .05$). There was no difference in narcissism between browsing conditions for those in the weak tie condition ($M_{\text{Facebook}} = 14.87$; $M_{\text{NoFacebook}} = 14.75$; $F(1, 95) = .14$; NS).

Facebook use and self-esteem. We examined self-esteem using ANOVA with browsing and tie strength as the factors and number of Facebook friends as a covariate. The browsing by tie strength interaction was significant ($F(1, 95) = 5.18; p < .05$; see figure 3b). As expected, those in the strong tie condition reported higher levels of self-esteem after browsing Facebook compared to those that did not browse Facebook ($M_{\text{Facebook}} = 3.25; M_{\text{NoFacebook}} = 2.64; F(1, 95) = 11.34; p = .001$). There was no difference in self-esteem between browsing conditions for those in the weak tie condition ($M_{\text{Facebook}} = 3.06; M_{\text{NoFacebook}} = 3.03; F(1, 95) = .03; \text{NS}$).

Mediation. We tested for moderated mediation analysis following the procedure proposed by Preacher, Rucker, and Hayes (2007; model 2). The analysis shows that the browsing by tie strength interaction predicted self-esteem ($\beta = .30, p < .05$). When self-esteem was added to the dependent variable model, it significantly predicted narcissism ($\beta = 2.97, p < .001$) while the browsing by tie strength interaction did not ($\beta = 1.51, \text{NS}$). Conditional indirect effects analyses using a bootstrap method supported our theory. Specifically, the analyses revealed that self-esteem mediated the effect of browsing in the strong tie condition ($z = 2.37, p < .05$), but self-esteem did not mediate the effect of browsing in the weak tie condition ($z = .18, \text{NS}$).

Discussion

The results of study 3 provide strong support for our theory. Specifically, the results show that the enhanced self-esteem from social network use leads to the excessive self-appraisals that characterize narcissism. Importantly, this increase in state narcissism was only observed in participants who were focused on strong ties while browsing Facebook. In the next study, we examine the relationship between self-presentation and the narcissistic mindset.

STUDY 4

The primary purpose of study 4 was to show that using a social network leads people with strong ties to adopt a narcissistic mindset because they are focused on the image they are presenting to others in their social network. To demonstrate this, we had people browse a social network while focusing on either the information they are presenting to people in their network (i.e., self-presentation) or the information people in their network are presenting to them (i.e., other-presentation). We expected those focused on self-presentation to report higher levels of narcissism than those focused on other-presentation. Importantly, we expected this effect to only emerge in individuals with strong ties to their social network.

Method

Participants and design. One hundred-eight Facebook users from a U.S. panel participated in the study ($M_{\text{Age}} = 32.25$; 53% Female). Participants were randomly assigned to one of two conditions (Presentation Focus: Self vs. Other) in the between-subjects design.

Procedure. The procedure was similar to that of previous studies with a few notable exceptions. First, participants indicated the number of friends they have on Facebook and the proportion of those friends that are close friends. In the self-presentation-focus condition, participants were told they would be browsing Facebook and were given the following instructions: “While you are browsing we would like you to pay attention to the information that you are sharing with people in your network.” In the other-presentation-focus condition, participants were told they would be browsing Facebook and were given the following instructions: “While you are browsing we would like you to pay attention to the information that people in your network are sharing with you.” All participants then browsed Facebook for five

minutes. Unlike other studies, we did not discourage them from interacting with others while browsing the website since all conditions in this study browsed Facebook.

Afterwards, participants completed the 40-item Narcissistic Personality Inventory (NPI; Raskin and Terry 1988; $\alpha = .90$) and the same three-item reduced self-esteem scale from the previous studies ($\alpha = .76$). As a check for the self-versus-other-presentation-focus manipulation, participants indicated the extent to which they agreed (1 = “Strongly Disagree”, 7 = “Strongly Agree”) that they were focused on the information they were sharing with others while browsing Facebook.

Results

Manipulation check. We examined how focused people were on the information they were sharing with others while browsing Facebook using regression with presentation focus (self = 1, other = -1), mean-centered tie strength, their interaction and number of Facebook friends as the independent variables. As expected, the effect of presentation focus was significant ($\beta = .01$, $t(103) = .95$, $p < .001$); those in the self-presentation focus condition indicated that they were more focused on the information they were sharing with others than those in the other-presentation focus condition. The effects of tie strength ($\beta = -.01$, $t(103) = -.13$, NS) and the tie strength by presentation focus interaction ($\beta = -.01$, $t(103) = -.24$, NS) were insignificant.

Self-presentation and narcissism. We examined narcissism using regression with presentation focus, mean-centered tie strength, their interaction and number of Facebook friends as the dependent variables. The presentation focus by tie strength interaction was significant ($t(103) = 2.34$; $p < .05$; see figure 4a). As expected, those with strong ties reported higher levels of narcissism when they focused on self-presentation compared to other-presentation while

browsing Facebook ($\beta = 1.67, t(103) = 2.24, p < .05$). There was no difference in narcissism between presentation focus conditions for those with weak ties ($\beta = -.80, t(103) = -1.09, NS$).

Self-presentation and self-esteem. We examined self-esteem using regression with presentation focus, mean-centered tie strength, their interaction and number of Facebook friends as the dependent variables. The presentation focus by tie strength interaction was marginally significant ($t(103) = 1.70; p < .10$; see figure 4b). As expected, those with strong ties reported higher levels of self-esteem when they focused on self-presentation compared to other-presentation while browsing Facebook ($\beta = .20, t(103) = 2.26, p < .05$). There was no difference in self-esteem between presentation focus conditions for those with weak ties ($\beta = -.01, t(103) = -.15, NS$).

Mediation. We tested for moderated mediation analysis follow the procedure proposed by Preacher, Rucker, and Hayes (2007; model 2). The analysis shows that the presentation focus by tie strength interaction predicted self-esteem ($\beta = .01, p < .10$). When self-esteem was added to the dependent variable model, it significantly predicted narcissism ($\beta = 2.90, p < .001$) while the presentation focus by tie strength interaction was only marginally significant ($\beta = .07, p < .10$). Conditional indirect effects analyses using a bootstrap method supported our theory. Specifically, the analyses revealed that self-esteem mediated the effect of presentation focus for those with strong ties ($z = 1.25, p < .05$), but self-esteem did not mediate the effect of presentation focus for those with weak ties ($z = -.09, NS$).

Discussion

The results of study 4 provide strong support for our theory. The results show that the narcissistic mindset adopted by people with strong ties is due to a focus on self-presentation. In

the next study, we examine the relationship between social network use and “offline” behaviors associated with poor self-control.

STUDY 5

In study 5, we conducted an online field study to examine the relationship between Facebook usage and behaviors associated with poor self-control in health and personal finances. If just five minutes of Facebook usage lowers self-control, then we would expect to be able to detect a positive relationship between the amount of time a person spends using Facebook and behaviors associated with poor self-control. However, we would only expect this relationship to emerge in individuals who felt closer to the people in their networks and thus had a relatively high proportion of strong-tie friends in social networks.

Method

Participants and procedure. Five hundred forty-one Facebook users from a U.S. panel participated in the study ($M_{\text{Age}} = 32.06$; 61% Female). Participants were recruited purportedly to participate in a survey on Internet use. As part of the survey, they were asked several questions about their Internet and Facebook use, as well as questions about their offline behavior including their finances, health, and offline social behavior. The order of the offline behavioral measures was randomized. Finally, participants were asked several demographic questions.

Measures. The Internet use measures included questions asking how many hours participants spend online each day, what percent of their time online is spent on social networking sites, the frequency with which they go on Facebook (1 = “Never” to 8 = “Multiple

times per day”), how many friends they have on Facebook and how close they are to their Facebook friends, which served as a measure of tie strength.

Poor self-control is associated with making unhealthier food choices and a greater likelihood of engaging in binge eating (Tangney, Baumeister, and Boone 2004). Thus, poor self-control is associated with higher body fat. Therefore, we asked participants their height and weight so that we could calculate their body-mass index (BMI), which is a widely used proxy for human body fat (Mills 2008). Additionally, we asked them to indicate how often they engaged in binge eating (1 = “Never” to 8 = “Multiple times per day”).

Previous research on consumer financial decision-making (Wilcox, Block, and Eisenstein 2011) has found that poor self-control is associated with a having a lower credit score and being more likely to incur credit card debt. Consequently, we asked participants to indicate how many credit cards they owned and how much credit card debt they had accumulated on those credit cards. Additionally, we asked them to indicate their credit score in one of five standard credit score categories (1 = “Risky – 619 or lower” to 5 = “Excellent – 750 and above”).

Measures also were taken of participants’ offline social behavior including how many hours each week they spend socializing with friends offline (i.e., on the phone or in person) and how many friends they have offline, as well as demographic variables including age, gender, and annual household income (1 = “Under \$14,999” to 7 = “\$100,000 and over”).

Results

Relationship between Facebook use and physical health. To examine BMI and binge eating, we first removed outliers by eliminating the two extreme categories of BMI, those considered to be underweight (BMI < 18.5) and severely overweight (BMI > 40; World Health

Organization 2011), leaving us with a subsample of four hundred ninety participants. Our rationale is that underweight consumers often suffer from issues related to body image distortion, which leads them to excessively control their food intake (Mohr et al. 2010). In addition, people who are severely overweight generally start having weight problems early on in childhood and there are both genetic and non-genetic components to their weight problems (Han, Lawlor, and Kimm 2010). We then analyzed BMI and binge eating by separately regressing them on the frequency of Facebook use (mean-centered), tie strength (mean-centered), and the interaction between frequency and tie strength. Age, gender and number of Facebook friends were included as covariates.

The tie strength by frequency interaction effect on BMI was significant ($\beta = .01$, $t(483) = 2.08$, $p < .05$; see figure 5a). To examine the relationship between frequency of Facebook use and BMI for those with strong ties we reran the above analysis with tie strength centered at one standard deviation above the mean (Aiken and West 1991). Frequency was positively associated with BMI for participants with strong ties, such that the more time they spend on Facebook the higher their BMI ($\beta = .43$, $t(483) = 2.04$, $p < .05$). An equivalent analysis with tie strength centered at one standard deviation below the mean found that frequency was not significantly associated with BMI for those with weak ties ($\beta = -.20$, $t(483) = -.81$, NS).

Additionally, the tie strength by frequency interaction effect on binge eating was significant ($\beta = .01$, $t(483) = 2.82$, $p < .01$; see figure 5b). To examine the relationship, we reran the analysis with tie strength centered at one standard deviation above the mean. Frequency was positively associated with binge eating for participants with strong ties, such that the more time they spend on Facebook the more likely they were to engage in binge eating ($\beta = .10$, $t(483) = 1.94$, $p = .05$). An equivalent analysis with tie strength centered at one standard deviation below

the mean found that frequency was negatively associated with binge eating, but the difference was only marginally significant ($\beta = -.11$, $t(483) = 0.83$, $p = .10$).

Relationship between Facebook use and financial well-being. To examine the relationship between Facebook use and one's credit score and the amount of credit card debt owed, we looked only at those individuals who owned a credit card since having a credit card is important for establishing credit (Vlasenko 2009) and a prerequisite for incurring credit card debt. This left us with a subsample of three hundred ninety-nine participants. We analyzed both variables by separately regressing them on the frequency of Facebook use (mean-centered), tie strength (mean-centered), and the interaction between frequency and tie strength. Age, gender, number of Facebook friends, number of credit cards owned and income were included as covariates.

The tie strength by frequency interaction on credit score was significant ($\beta = -.01$, $t(390) = -2.32$, $p < .05$; see figure 5c). We examined the relationship by rerunning the analysis with tie strength centered at one standard deviation above and below the mean. Frequency was negatively associated with credit score for those with strong ties, such that the more often they used Facebook the lower their credit score ($\beta = -.13$, $t(390) = -2.30$, $p < .05$). Frequency was not significantly associated with credit score for those with weak ties ($\beta = .05$, $t(390) = .85$, NS).

The tie strength by frequency interaction on credit card debt also was significant ($\beta = 13.58$, $t(390) = 2.29$, $p < .05$; see figure 5d). We examined the relationship by rerunning the analysis with tie strength centered at one standard deviation above and below the mean. Frequency was positively associated with credit card debt for those with strong ties, such that the more often they used Facebook the greater their credit card debt ($\beta = 500.64$, $t(390) = 2.13$, $p <$

.05). Frequency was not significantly associated with credit card debt for those with weak ties ($\beta = -270.00$, $t(390) = 0.08$, NS).

Analysis of Internet and offline social behavior. We also examined the relationship between tie strength and participants' Internet and offline social behavior to rule out the possibility that there was something unique about people with strong ties to their Facebook friends that could explain our findings. For instance, it is possible that people with strong ties to their friends spend an inordinate amount of time online or on social networking sites, instead of exercising or socializing with offline friends, which could offer an alternative explanation for our findings. Tie strength was not significantly correlated with the amount of time spent online ($r = -.02$), the percent of online time spent on social networks ($r = -.07$), the amount of time spent socializing with offline friends ($r = -.05$) or the total number of offline friends participants had ($r = .01$). Thus, there does not appear to be anything unique about participants' Internet or offline social behavior that could explain our findings.

Discussion

This fifth study demonstrates that for those with strong ties Facebook use is a significant predictor of a range of behaviors that are consistent with poor self-control. While we acknowledge that the data in this study is correlational, the findings are consistent with those in the experiments where Facebook use was manipulated and reduce the concern that the previous studies' results are artifacts of the particular browsing manipulation that we used.

GENERAL DISCUSSION

Using online social networks such as Facebook has become part of the daily routines of hundreds of millions of people around the world. As prior research has shown, a number of psychological benefits can indeed be derived from using online social networks. However, across seven studies we demonstrated that using the currently most popular and prominent social network (Facebook) may lead consumers to adopt a narcissistic mindset and have a detrimental effect on their self-control. We found that greater Facebook use is associated with poor self-control in a number of important domains: spending (studies 1A and 5), health (studies 2A and 5) and mental persistence (studies 1B and 2B). We also show that social network use leads people to report higher levels of narcissism. Importantly, we demonstrate that these results are due to excessive self-esteem produced by self-presentation on social networks. Specifically, we show that social networks only increase self-esteem and result in narcissistic behavior in individuals focused on strong ties while browsing Facebook. Additionally, we show that those focused on strong ties only display increased self-esteem and report higher levels of narcissism when they are cued to focus on the image they are presenting on social network. Those with strong ties do not display increased self-esteem and report higher levels of narcissism when they are cued to focus on the image that others are presenting to them on social networks.

This research advances our knowledge of social networks by demonstrating that social networks can have significant effects on consumer judgment and decision-making, even in tasks that are unrelated to social network use or more general social behavior. Previous research has demonstrated that social networks can have a positive effect on how people feel about themselves and their well-being. For instance, social network use (or, more generally, online community activity) has been shown to enhance self-esteem (Gonzales and Hancock 2011; Valkenburg et al. 2006), increase social capital (Ellison et al. 2007), bolster emotional well-being

(Buechel and Berger 2012), and lead to increased prosocial behaviors (Stephen and Galak 2012). In contrast, our research demonstrates that social network use may also have a detrimental effect on well-being by triggering a narcissistic mindset that leads people to exhibit lower self-control.

This research has important implications for the relationship between self-esteem and self-control. Although previous research has demonstrated that increased feelings of self-worth may lead to less self-control, much of this research is based on licensing effects whereby focusing on past accomplishments or behaviors makes people feel justified to indulge themselves (Fishbach and Dhar 2005; Khan and Dhar 2006; Wilcox et al. 2011). Our studies, however, demonstrate that people do not need to rely on past behaviors as a source of entitlement; momentarily increasing self-esteem in an incidental fashion, such as by browsing a social network, can lower self-control. Future research, however, should explore whether this effect is limited to social networks or whether any situational factor that incidentally increases self-esteem will lower self-control. For instance, can sharing favorable images with close friends online through various photo sites (e.g., Picasa) affect self-control? Would presenting an inflated self-image (e.g., an expert opinion) in an online community lead to a narcissistic mindset?

Our findings also have important implications for the literature on narcissism. In studies 3 and 4, we demonstrate that momentary increases in feelings of self-worth from social network use can lead people to self-report higher levels of narcissism. To the best of our knowledge, this is the first research to show that narcissism, which is typically seen as a chronic personality trait, can instead be a time-varying state or mindset that can be incidentally induced. We note, however, that what we observe may not be narcissism per se but rather the excessive self-appraisals that resemble or are consistent with narcissism.

This research also complements existing research on social relationships and self-control. For instance, Vohs, Ciarocco and Baumeister (2005) find that when people engage in self-presentation under challenging conditions (e.g., a skeptical audience) or counter to normative patterns (e.g., being modest to strangers) they subsequently display less self-control. While the focus of their research is on how the physical effort associated with self-presentation depletes self-control resources, our research shows that even virtual self-presentation can affect self-regulation through enhanced feelings of self-worth. In related research, DeWall, Vohs and Baumeister (2008) show that when people feel socially accepted, they perform worse at self-regulatory tasks that are purportedly diagnostic indicators of interpersonally attractive traits. On the other hand, socially excluded individuals performed worse at the tasks unless they were framed as indicators of being able to get along with others. Based on this related finding, one might argue that using social networks like Facebook can affect perceptions of social acceptance and social exclusion that influence ability to exert self-control.

The current research also complements a nascent stream of research on Facebook use, narcissism and self-presentation behaviors. For example, Mehdizadeh (2010) documented how narcissism and self-presentation are manifested on Facebook by observing 100 Canadian college students, and found a positive correlation between narcissism and activity on Facebook. A survey of 292 Facebook users found a similar pattern (Carpenter 2012). However, unlike the current research, these correlational studies do not establish that browsing Facebook can lead to people adopting a narcissistic mindset. Thus, this paper is an important step toward a better understanding of how using social networks like Facebook affect peoples' narcissistic tendencies and related behaviors, even for people who are naturally low on narcissism.

While social networks such as Facebook are increasingly popular communications tools, our studies show that there is a clear downside to giving people the ability to both easily and repeatedly self-present oneself to others in a focused manner. Inducing narcissistic behaviors that make poor self-control more likely in a variety of important contexts is troubling. While further research is needed to more fully explore the nature of narcissism in the context of social networking, it appears that this mechanism does not only operate on those who are naturally more narcissistic or prone to self assessments associated with narcissism. Instead—and perhaps more concerning—this mechanism operates for those people who have stronger ties to their social networks. In other words, people who maintain stronger, closer, and likely more personally meaningful relationships with others in their online social networks are most prone to the self-control-lowering effects of social network use documented here.

Moreover, the effect of social network use on individuals' abilities to exhibit self-control is concerning given the increased time people are spending using social networks in part due to the worldwide proliferation of access to social networks anywhere anytime (i.e., via mobile smartphones, smart TVs, tablet computers, etc.). Even a small five-minute “dose” of social network use in our studies was enough to significantly lower self-control in subsequent choices and tasks. Heavy users likely expose themselves to multiple doses of this effect a day. Based on mid-2011 usage statistics reported by Facebook, an average active user typically accumulates approximately 60 minutes of time on Facebook per day spread over an average of three browsing sessions.

Given that self-control is important for maintaining social order and personal well-being, this subtle effect could have widespread impact. This is particularly true for adolescents and young adults who are the heaviest users of social networks and have grown up using social

networks as a normal part of their daily lives. Because of these factors, our findings have important policy implications. It would be worthwhile for researchers and policymakers to further explore social network use in order to better understand which consumers may be particularly vulnerable to suffering negative psychological or social consequences. In particular, examining whether adolescent users are more prone to negative consequences due to being in a more turbulent state of social development than adult users would be an important direction for future research. Further, developing ways to educate social network users about negative consequences and how to more appropriately use social networks (e.g., less for self presentation) could also be valuable from a policy perspective.

Our research points to several interesting areas for future research. For instance, it would be interesting to understand how Facebook use affects other consumer behaviors that are not related to self-control. Consumers use social networks to fulfill a variety of social needs including self-expression and self-presentation. Many of these same needs underlie the decision to purchase luxury brands and affect how consumers respond to messages promoting image versus quality. Consequently, future research may want to examine how browsing Facebook affects consumers' desire for luxury brands. Additionally, since we did not examine how social interactions on a social network influence behavior, it would be interesting to explore how different types of social interactions on social networks influence self-control and related behaviors. Does posting on a social network have the same effect on self-esteem and self-control as simply browsing the website? How does instant messaging with friends on a social network affect behavior? The findings of such research likely would depend on the nature of the interaction, but it would be interesting to see whether interacting with friends intensifies or mitigates the effect of simply browsing social networks. Finally, it would be interesting to

explore the persistence of the effect of browsing Facebook over time. Although study 5 suggests that the effects of Facebook use on self-control are not merely ephemeral, a deeper examination of how long these effects last is an interesting avenue for future research. We hope these and related ideas encourage additional work on this nascent but increasingly important area of consumer research.

REFERENCES

- Aiken, Leona S. and Stephen G. West (1991), *Multiple Regression: Testing and Interpreting Interactions*, Newbury Park, CA: Sage Publications.
- Back, Mitja D., Juliane M. Stopfer, Simine Vazire, Sam Gaddis, Stefan C. Schmukle, Boris Egloff, and Samuel D. Gosling (2010), "Facebook Profiles Reflect Actual Personality, Not Self-Idealization," *Psychological Science*, 21 (3), 372-74.
- Banaji, Mahzarin R. and Claude M. Steele (1989) "The Social Cognition of Alcohol Use," *Social Cognition*, 7, 137-51.
- Brown, Jacqueline Johnson and Peter H. Reingen (1987), "Social Ties and Word-of-Mouth Referral Behavior," *Journal of Consumer Research*, 14 (2), 350-62.
- Buechel, Eva and Jonah Berger (2012), "Facebook Therapy? Why Do People Share Self-Relevant Content Online?" working paper.
- Bushman, Brad J. and Roy F. Baumeister (1998), "Threatened Egotism, Narcissism, Self-Esteem, and Direct and Displaced Aggression: Does Self-Love or Self-Hate Lead to Violence?" *Journal of Personality and Social Psychology*, 75 (1), 219-29.
- Bushman, Brad J. and Cooper, Harris M. (1990), "Effects of Alcohol on Human Aggression: An Integrative Research Review," *Psychological Bulletin*, 107, 341-54.
- Carpenter, Christopher J. (2012), "Narcissism on Facebook: Self-Promotional and Anti-Social Behavior," *Personality and Individual Differences*, 52 (4), 482-486.
- DeWall, C. Nathan, Kathleen D. Vohs and Roy F. Baumeister (2008), "Satiated With Belongingness? Effects of Acceptance, Rejection, and Task Framing on Self-Regulatory Performance," *Journal of Personality and Social Psychology*, 95 (6), 1367-382.

- Diamond, Deborah L and Sharon C. Wilsnack (1978) "Alcohol Abuse Among Lesbians: A Descriptive Study," *Journal of Homosexuality*, 4, 205-216.
- Ellison, Nicole B., Charles Steinfield, and Cliff Lampe (2007), "The Benefits of Facebook "Friends": Social Capital and College Students' Use of Online Social Network Sites," *Journal of Computer-Mediated Communication*, 12 (4), 1143-67.
- Fedorikhin, Sasha and Vanessa M. Patrick (2010), "Positive Mood and Resistance to Temptation: The Interfering Influence of Elevated Arousal," *Journal of Consumer Research*, 37 (December), 698-711.
- Fishbach, Ayelet and Ravi Dhar (2005), "Goals as Excuses or Guides: The Liberating Effect of Perceived Goal Progress on Choice.," *Journal of Consumer Research*, 32 (3), 370-77.
- Frenzen, Jonathan K. and Kent Nakamoto (1993), "Structure, Cooperation, and the Flow of Market-Information," *Journal of Consumer Research*, 20 (3), 360-75.
- Fujita, Kentaro, Yaacov Trope, Nira Liberman and Maya Levin-Sagi (2006), "Construal Levels and Self-Control," *Journal of Personality and Social Psychology*, 90 (3), 351-67.
- Gonzales, Amy L. and Jeffrey T. Hancock (2011), "Mirror, Mirror on my Facebook Wall: Effects of Facebook Exposure on Self-Esteem.," *Cyberpsychology, Behavior & Social Networking*, (January/February), 79-83.
- Gosling, Samuel D., Sam Gaddis, and Simine Vazire (2007), *Personality Impressions Based on Facebook Profiles*, In Proc International Conference on Weblogs and Social Media.
- Govern, John M. and Lisa A. Marsch (2001), "Development and Validation of the Situational Self-Awareness Scale," *Consciousness and Cognition*, 10 (3), 366-78.
- Granovetter, Mark S. (1973), "The Strength of Weak Ties," *American Journal of Sociology*, 78 (6), 1360-80.

- Han, Joan C., Debbie Lawlor, and Sue Y. Kimm (2010), "Childhood Obesity," *Lancet*, 375 (9727), 1737-48.
- Khan, Uzma and Ravi Dhar (2006), "Licensing Effect in Consumer Choice," *Journal of Marketing Research*, 43 (2), 259-66.
- Lakey, Chad E., Paul Rose, W. Keith Campbell and Adam S. Goodie (2008), "Probing the Link Between Narcissism and Gambling: The Mediating Role of Judgment and Decision-Making Biases," *Journal of Behavioral Decision-Making*, 21, 113-37.
- Marsden, Peter V. and Karen E. Campbell (1984), "Measuring Tie strength," *Social Forces*, 63, 482-501.
- Mehdizadeh, Soraya (2010), "Self-Presentation 2.0: Narcissism and Self-Esteem on Facebook," *Cyberpsychology, Behavior, and Social Networking*, 13 (4), 357-364.
- Mills, Terence C. (2008), "Predicting Body Fat Using Weight-Height Indices," *Journal of Applied Statistics*, 35 (10), 1131-38.
- Mohr, H. M. , J. Zimmermann, C. Röder, C. Lenz, G. Overbeck, and R. Grabhorn (2010), "Separating Two Components of Body Image in Anorexia Nervosa Using fMRI," *Psychological Medicine: A Journal of Research in Psychiatry and the Allied Sciences*, 40 (9), 1519-29.
- Nielson (2010), "What Americans Do Online: Social Media And Games Dominate Activity," *Nielsen Wire*, Retrieved May 18, 2011.
- Preacher, Kristopher. J., Derek D. Rucker, and Andrew F. Hayes (2007), "Addressing moderated mediation hypotheses: Theory, methods, and prescriptions," *Multivariate Behavioral Research*, 42 (1), 185-227.

- Rose, Paul (2007), "Mediators of the Association Between Narcissism and Compulsive Buying: The Roles of Materialism and Impulse Control," *Psychology of Addictive Behaviors*, 21 (4), 576-81.
- Rosenberg, Morris (1989), *Society and the Adolescent Self-Image*, Middeltown, CT: Wesleyan University Press.
- Ryu, Gangseog and Lawrence Feick (2007), "A Penny for Your Thoughts: Referral Reward Programs and Referral Likelihood," *Journal of Marketing*, 71 (1), 84-94.
- Schau, Hope Jensen and Mary C. Gilly (2003), "We Are What We Post? The Presentation of Self in Personal Webspace," *Journal of Consumer Research*, 30 (4), 385-404.
- Steele, Claude M. and Robert A. Josephs (1990), "Alcohol Myopia: Its Prized and Dangerous Effects," *American Psychologist*, 45 (8), 921-33.
- Stephen, Andrew T. and Jeff Galak (2012), "The Effects of Traditional and Social Earned Media on Sales: A Study of a Microlending Marketplace," *Journal of Marketing Research*, forthcoming.
- Sudman, Seymour, Barbara Bickart, Johnny Blair and Geeta Menon (1993), "A Comparison of Self and Proxy Reporting," in Norbert Schwarz and Seymour Sudman (eds.), *Autobiographical Memory and the Validity of Retrospective Reports*, New York: Springer-Verlag, 251-266.
- Tangney, June P., Roy F. Baumeister, and Angie Luzzio Boone (2004), "High Self-Control Predicts Good Adjustment, Less Pathology, Better Grades, and Interpersonal Success," *Journal of Personality*, 72 (2), 271-324.

- Toubia, Olivier and Andrew T. Stephen (2012), "Intrinsic Versus Image-Related Motivations in Social Media: Why Do People Contribute Content to Twitter?" working paper, Columbia University.
- Valkenburg, Patti M., Jochen Peter, and Alexander P. Schouten (2006), "Friend Networking Sites and their Relationship to Adolescents' Well-Being and Social Self-Esteem," *Cyberpsychology & Behavior*, 9 (5), 584-90.
- Vlasenko, Polina (2009), "What You Need to Know About Credit Cards," *Economic Education Bulletin*, 49 (2), 509.
- Vazire, Simine and David C. Funder (2006), "Impulsivity and the Self-defeating Behavior of Narcissists," *Personality and Social Psychology Review*, 10 (2), 154-65.
- Vohs, Kathleen D. and Todd F. Heatherton (2000), "Self-Regulatory Failure: A Resource-Depletion Approach," *Psychological Science*, 11 (3), 249-54.
- Vohs, Kathleen D., Natalie J. Ciarocco and Roy F. Baumeister (2005), "Self-Regulation and Self-Presentation: Regulatory Resource Depletion Impairs Impression Management and Effortful Self-Presentation Depletes Regulatory Resources," *Journal of Personality and Social Psychology*, 88 (4), 632-57.
- Wilcox, Keith, Lauren Block, and Eric Eisenstein (2011), "Leave Home Without It? The Effects of Credit Card Debt and Available Credit on Spending," *Journal of Marketing Research*, 48 (November).
- Wilcox, Keith, Thomas Kramer and Sankar Sen (2011), "Indulgence or Self-Control: A Dual Process Model of the Effect of Incidental Pride on Indulgent Choice," *Journal of Consumer Research*, 38 (June), 151-63.

World Health Organization (2011) "BMI Classification," (accessed September 12, 2011),
[available at http://apps.who.int/bmi/index.jsp?introPage=intro_3.html].

Worthan, Jenna (2011), "Feel Like a Wallflower? Maybe It's Your Facebook Wall," *New York Times*, BU3.

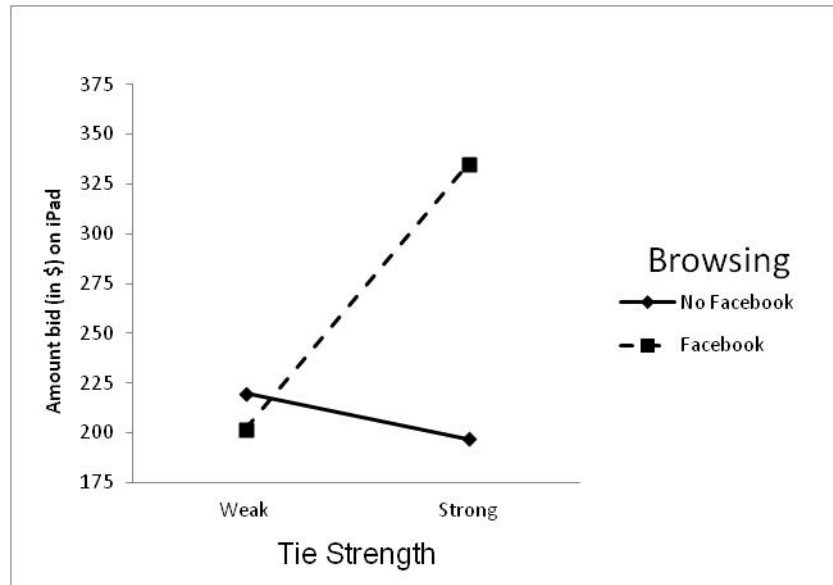
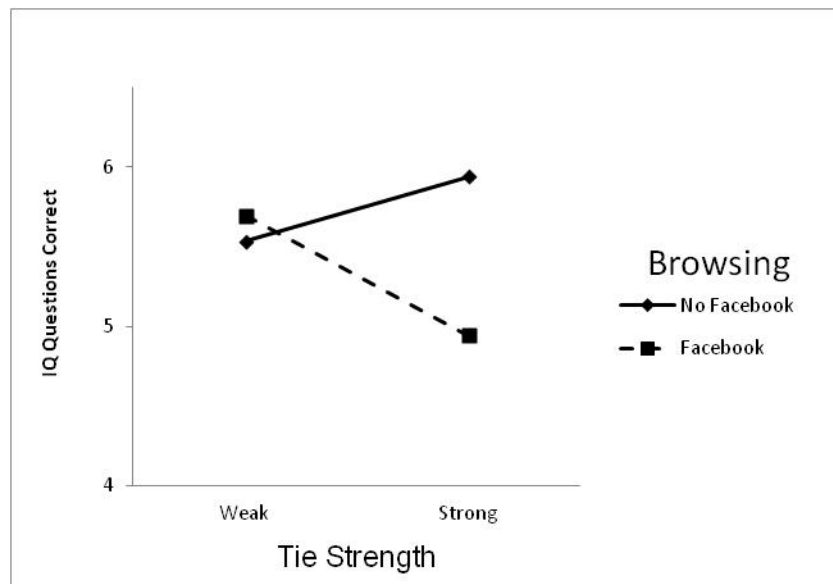
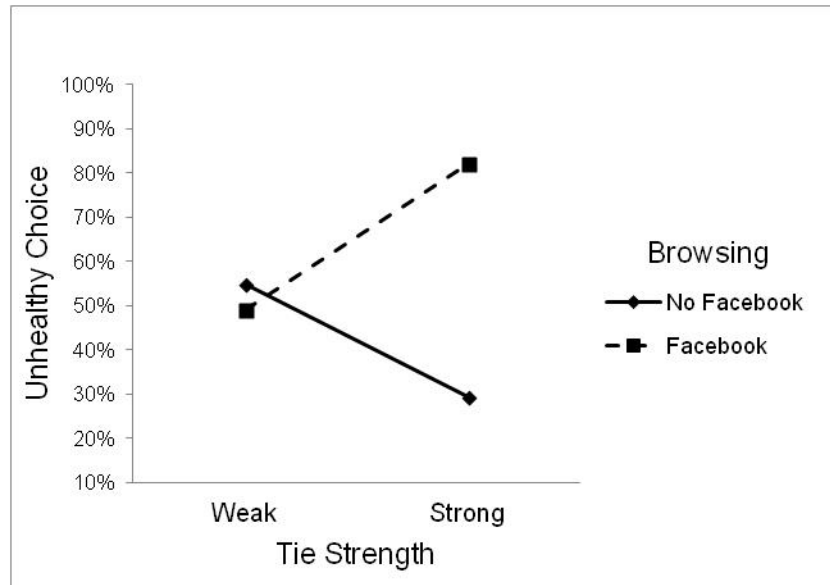
FIGURE 1**STUDY 1A: THE EFFECT OF FACEBOOK ON SPENDING CONTROL****(a)****STUDY 1B: THE EFFECT OF FACEBOOK ON TASK PERFORMANCE****(b)**

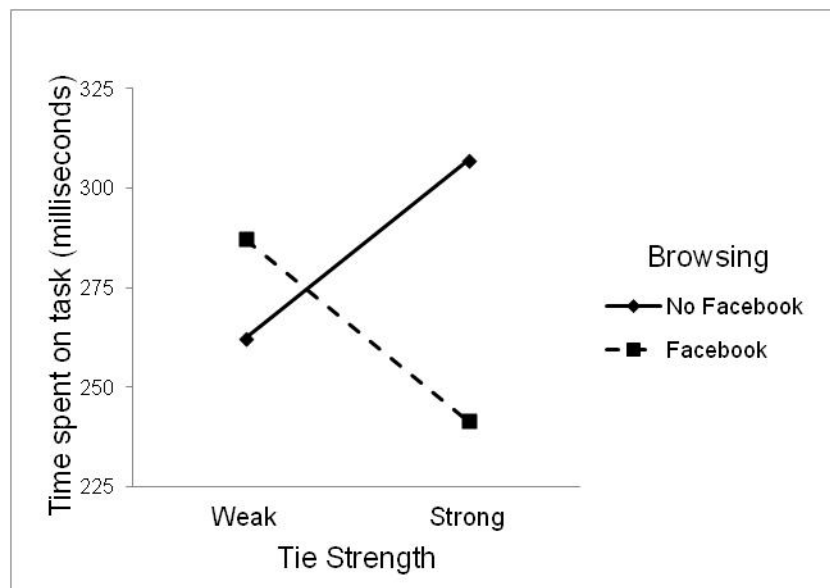
FIGURE 2

STUDY 2A: THE EFFECT OF FACEBOOK ON UNHEALTHY CHOICE



(a)

STUDY 2B: THE EFFECT OF FACEBOOK ON TASK PERSISTENCE



(b)

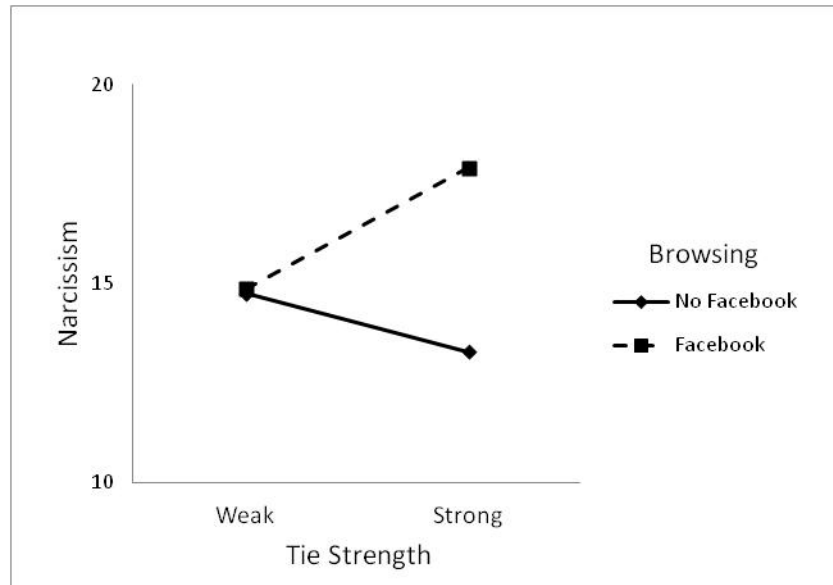
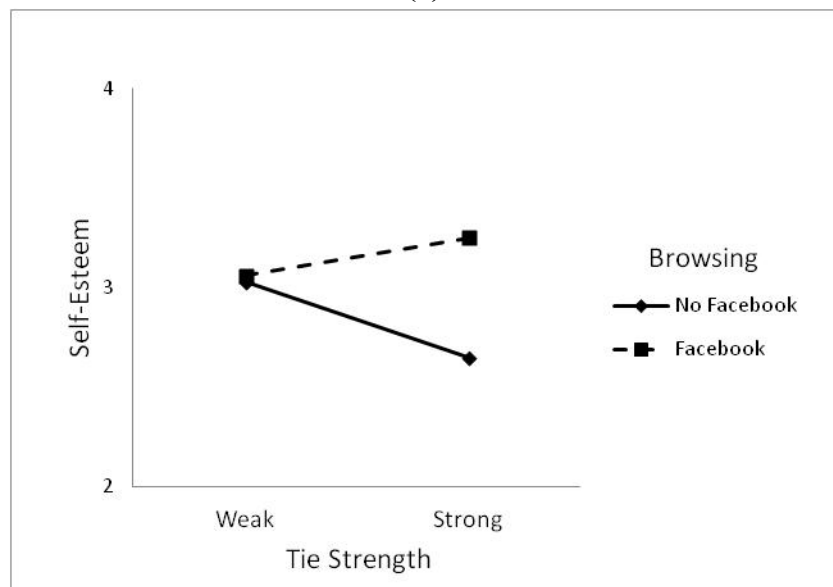
FIGURE 3**STUDY 3: THE EFFECT OF FACEBOOK ON NARCISSISM****(a)****(b)**

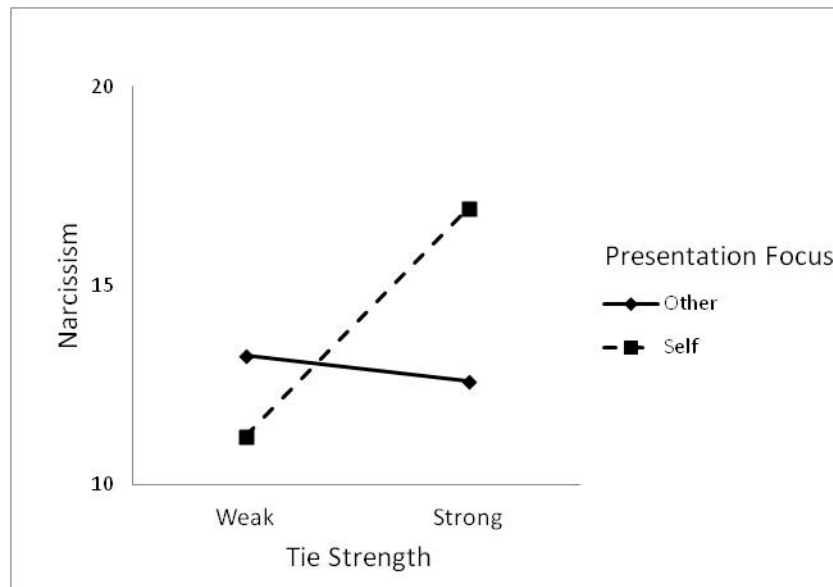
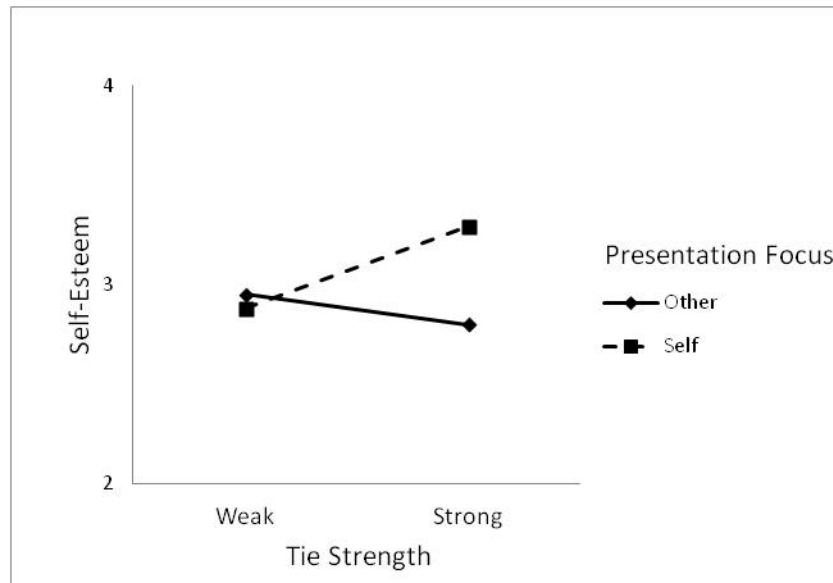
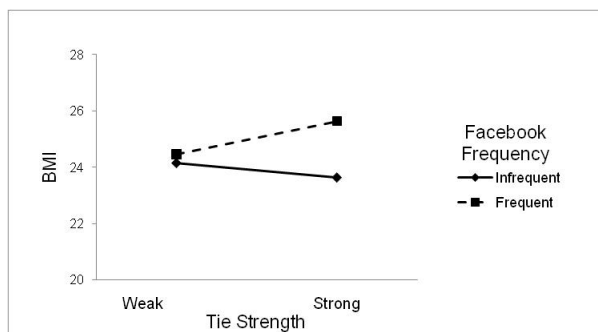
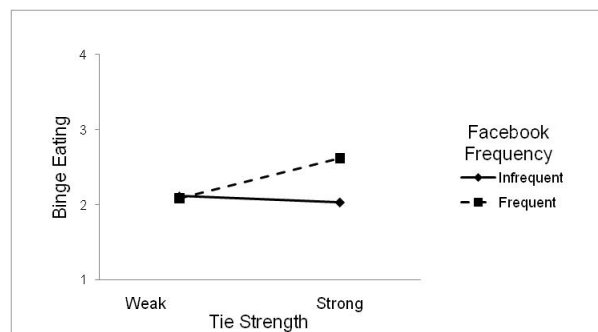
FIGURE 4**STUDY 4: THE EFFECT OF SELF PRESENTATION ON NARCISSISM****(a)****(b)**

FIGURE 5

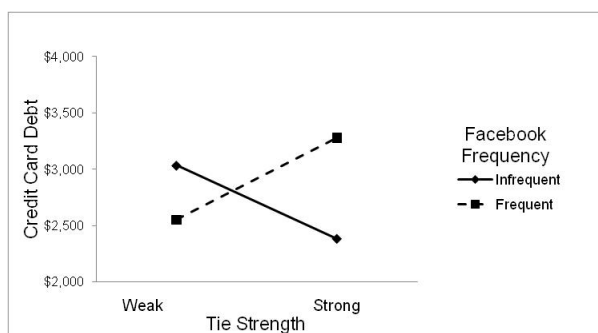
STUDY 5: THE RELATIONSHIP BETWEEN FACEBOOK USE AND BEHAVIOR



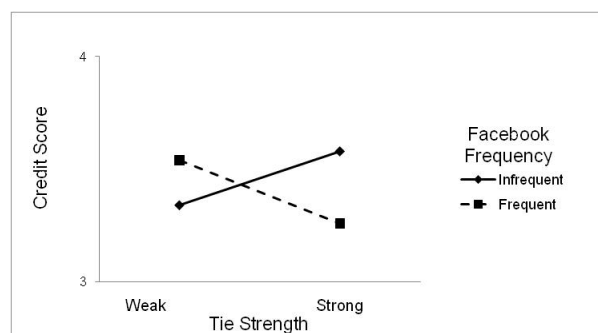
(a)



(b)



(c)



(d)