

Facebook Paradox? The Effects of Facebooking on Individuals'

Social Relationships and Psychological Well-being

By

Xiaomeng Hu

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ABSTRACT OF THE THESIS

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Thesis Director:

Dr. David Wilder

Research suggests that Facebooking can be both beneficial and detrimental for users' psychological well-being ("Facebook Paradox"). However, the specific effects of Facebooking on individuals' social relationship satisfaction and psychological well-being remain inconclusive. Using structural equation modeling, causal pathways were examined between Facebook intensity, online and offline social relationship satisfaction, perceived social support, social interaction anxiety, and psychological well-being. Personality differences on each of those casual paths were also assessed. Employing a sample of 342 university students, results indicated that intensive Facebooking positively predicted users' psychological well-being through online social relationship satisfaction, and simultaneously negatively predicted users' psychological well-being through offline social relationship satisfaction. Furthermore, perceived social support mediated the path from Facebooking to psychological well-being, and social interaction anxiety mediated the path from offline social relationship satisfaction to psychological well-being. Taken together, the present study suggests that when and how Facebooking is helpful or harmful to users' psychological well-being depends on both user characteristics and online-offline social contexts.

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Finally, I'm indebted to my parents, my husband, and my lovely son. Without their support, I would never be able to pursue my research career and accomplish my goals. I feel ashamed for not spending more time with my family and taking care of my parents. Work-family balance is a tough issue for me but I will try my best to do well on both and creating a learning, happy, and meaningful life style for my loved ones and myself.

Table of Contents

ABSTRACT OF THE THESIS..... ii

Acknowledgments..... iii

Table of Contents..... iv

List of Tables..... v

List of Figures..... vi

List of Appendices..... vii

Introduction..... 1

Methods..... 9

Results..... 13

Discussion..... 17

Conclusion..... 22

Appendices..... 23

References..... 46

List of Tables

Table 1: Descriptive Statistics of all Variables and Demographics.....	23
Table 2: Zero-order Correlation Matrix.....	24
Table 3: Model Comparisons and Fit Statistics.....	25

List of Figures

Figure 1: The Hypothesized Model.....	26
Figure 2: The Hypothesized Alternative Model.....	27
Figure 3: The Final Model... ..	28
Figure 4: The Trimmed Alternative Model.....	29

List of Appendices

Appendix A: Table 1 through Table 3.....	23
Appendix B: Figure 1 through Figure 4.....	26
Appendix C: Facebook Usage Questionnaire.....	30
Appendix D: Social Relationship Satisfaction Scale.....	31
Appendix E: Perceived Social Support Scale.....	35
Appendix F: Satisfaction With Life Scale (SWLS).....	38
Appendix G: The Big Five Personality Test (BFI).....	39
Appendix H: Social Interaction Anxiety Scale (SIAS).....	42
Appendix I: Demographics.....	44

Introduction

Internet Paradox

People are living in an unprecedentedly interconnected world as a result of recent technological innovations. The Internet, which allows people to bridge great distances and reach a mass audience, has immensely revolutionized people's interpersonal communications and relationship patterns (Bargh & McKenna, 2004; Dimaggio, Hargittai, Neuman, Robinson, & Robinson, 2012; Forest & Wood, 2012; Wilson, Gosling, & Graham, 2012). Researchers in multi-disciplinary fields, including psychology, sociology, communication, computer science, and social work, are interested in understanding the role of the Internet in contemporary society.

The Internet is a unique psychological environment (Joinson et al., 2007). It offers a brand new way for people's communication and interaction with very limited nonverbal behaviors. "If all thinking is really a kind of conversation, it is never a small challenge to convert it into a medium of pure words", as Teske (2002) has noted, "and much of the feeling, the embodiment, and the lived reality behind it is likely to be missed (p. 677)." Interestingly, scholars have contradictory opinions on the impact of the Internet on social behaviors. In the early 1990s, people were warned that widespread use of the Internet would produce a "nation of strangers" that was potentially detrimental for community participation and meaningful social integration (Kraut et al., 1998). One early study based on large survey data revealed that Internet use was associated with increased levels of loneliness and depression, decreased social support, and thereby might reduce social involvement and psychological well-being (Kraut et al., 1998). Especially among heavy

users, the avoidance of genuine social interaction would cause impairment of social functioning (Forest & Wood, 2012).

However, other scholars held a more optimistic attitude towards Internet use; they argued that communication via Internet had positive benefits in facilitating social relationships since it is a platform that is “unrestricted by location, one in which appearance, ethnicity, gender, education and socioeconomic categories are obscured, opening the way for a commonweal of greater pluralism, diversity, and individual liberty” (Teske, 2002, p.680). In defense of the Internet, Shaw and Grant (2002) reported that Internet use decreased loneliness and depression while perceived social support and self-esteem increased. Moreover, when Kraut et al., (2001) revisited the effects of Internet use with longitudinal data, they found that, initially, both stress and positive affect increased with Internet use, but stress decreased after a one-year period. They attributed the change from negative consequences to positive consequences to a change in the nature of the Internet. More recently, a meta-analysis of 40 studies revealed small detrimental effects of Internet use on psychological well-being (Huang, 2010). Instead of endorsing the Technology Determinism position that human beings are shaped by technology, researchers began to advocate the Technology Constructivism position that views the relationship between humans and technology in a more interactive way. That is to say, individuals’ online and offline worlds are mutually constructed (Xie, 2008).

Social Networking Sites

Social network sites (SNSs) have become an integral part of everyday life. The SNSs are undoubtedly attracting the attention and interest of academic and industry

researchers intrigued by their affordances and reach (Boyd & Ellison, 2007). Many topics including impression management, network structure, bridging online and offline social networks, privacy, and how identity is shaped within these sites have been investigated (Boyd & Ellison, 2007, p.210). Social networking is one of the major reasons that people use SNSs since it allows users to share a significant amount of personal information and a variety of resources as well as keep connected with family, partner, close friends, friends' friends and even strangers cheaply and efficiently. By comparing users' online and offline social network size, Acar (2008) reported that individuals' online social network size was significantly larger than their real life social network size (p.74). Their results also showed that extroverts had larger online network size than introverts, and women had more members in their online social networks than men and spent more time on the Internet for social networking.

Facebook Paradox

Among various types of SNSs (Facebook, Twitter, Instagram, LinkedIn, MySpace, etc.), Facebook has now passed 1.19 billion monthly active users. Of those, daily active users passed 728 million on average during September 2013, and the number of monthly active mobile users hit 874 million (Facebook statistics, 2013). Research has examined mainly five topics regarding Facebook: descriptions of Facebook users, motivations for using Facebook, identity presentation, the effects of Facebook on social interaction, and privacy and information disclosure (for a review see Wilson et al, 2012). Studies have also examined four primary needs for participating in groups within Facebook: socializing, entertainment, status seeking, and information seeking (Groups, Park, Kee, &

Al, 2009). A dual factor model was proposed to explain the primary drivers of Facebook use which were belongingness and self-presentation (Nadkarni & Hofmann, 2012).

Parallel to the Internet paradox, Facebook paradox is proposed to describe the phenomenon that Facebook has mixed effects (both positive and negative) on individuals' psychological well-being. Popular media has mostly negatively portrayed Facebook because of its detrimental effects on users' sociability and mental health, especially among adolescent and young adults (The Atlantic, 2012; NPR, 2013). Empirical evidence also supported this paradox. Because online relationships contain much weaker ties than offline ones (Vitak, 2008, p5), people have concerns about whether the growth of online connections is at the expense of offline relationships (displacement hypothesis). More importantly, evidence has been found of an association between Facebook use and depression among adolescents and young adults (O'Keeffe & Clarke-Pearson, 2011). Greater Facebook use predicted declines in both cognitive well-being and affective well-being over time (Kross et al., 2013). Frequent Facebook interaction was associated with greater stress directly and indirectly via a two-step pathway that increased communication overload and reduced self-esteem (Chen & Lee, 2013). "Facebook envy" was proposed to describe the phenomena in which people share their most positive experiences in order to construct an appealing online persona (Chen & Lee, 2013). Furthermore, a social network structure analysis revealed that romantic relationships were more likely to end when partners had more mutual friends on Facebook (Backstrom & Kleinberg, 2013).

In contrast, research also has identified certain benefits and advantages of Facebooking. Adopting an experience sampling method to evaluate the associations

between social networking use and depression among older adolescents, Hayes and Scharrow (2013) reported no association between SNS use and depression. Other research has reported that intensity of Facebook use was positively related to students' life satisfaction, social trust, civic engagement, and political participation (Valenzuela, Park, & Kee, 2009). Updating status on Facebook reduced loneliness through increasing users' daily social connectedness (Deters & Mehl, 2012). These findings suggest that Facebook use may facilitate young adults' social participation and psychological well-being. Paradoxically, greater Facebook use was found to be correlated with both relatedness need-satisfaction and relatedness need-dissatisfaction (Sheldon, et al., 2011). That is to say, Facebook users felt both more connected and disconnected to others when engaging Facebooking. Therefore, existing research suggests a "Facebook Paradox" in which Facebooking can be both beneficial and detrimental to users' psychological well-being.

Personality and Facebook Use

Personality characteristics can impact the way an individual behaves on the Internet. According to the Oxford Handbook of Internet Psychology, some personality traits have been identified to be associated with Internet use: need for closure, need for cognition, locus of control, sensation seeking and risk taking, and the big five personality traits (Amichai-Hamburger, 2007, p187). A number of studies examined the relationship between big five personality traits and Facebook use. Extroverted and unconscientious individuals reported higher levels of SNS use (Wilson, Fornasier, & White, 2010). People high in extraversion reported greater Facebook use, and those high in neuroticism

engaged in more self-disclosing (actual, hidden, and ideal selves) and self-presentational behavior (Seidman, 2013). Moreover, people with low self-esteem were more likely to engage actively in social compensatory friending (Lee, Moore, Park, & Park, 2012) and felt safer to disclose themselves on Facebook, even though they did not reap the social benefits (i.e. be liked by their Facebook friends) (Forest & Wood, 2012).

More interestingly, two hypotheses were proposed to explain the connection between personality and social networking use (Valkenburg & Peter, 2007; Zywicki & Danowski, 2008). *The social enhancement hypothesis (rich-get-richer)* argues that individuals with pre-existing social structures and socially adaptive personalities reap larger social benefits from internet use and use the internet more for social communication. *The social compensation hypothesis (poor-get-richer)* argues that individuals who struggle to make social connections in face-to-face interactions use the Internet as a means to compensate for their interpersonal lives.

The Present Study

Past research has shown interesting but inconsistent patterns for the relationships among Facebook use, social interaction, personality characteristics, and psychological well-being. In addition, there has been limited research that has investigated the underlying social psychological processes of the “*Facebook Paradox*”. Particularly, research has not examined how Facebook use affects young adults’ social relationship satisfaction and psychological well-being. The present study examined possible causal pathways to explain how Facebooking affects individuals’ social relationship satisfaction and psychological well-being, as well as the roles that perceived social support and social

interaction anxiety play in the above processes. This study also attempted to unlock the “*Facebook Paradox*” by examining users’ online and offline social relationship satisfaction separately and the impact of some personality differences. Facebooking was expected to be positively associated with users’ online social relationship satisfaction but negatively associated with users’ offline social relationship satisfaction. Satisfaction with online social relationships was expected to be positively associated with offline social relationships.

Research has indicated that extraversion and neuroticism are the two main predictors of social networking use (Correa, Hinsley & Zúñiga, 2010). For extraverts or non-neurotics, Facebooking helps users maintain, reinforce, and expand their pre-existing social relationships (*social enhancement hypotheses*), which, in turn, increases users’ perceived social support and psychological well-being. Therefore, there should be a strong positive relationship among Facebooking, perceived social support, and psychological well-being for extraverts. However, for introverts or neurotics, face-to-face social interactions can be difficult and challenging. Thus, Facebook becomes a more psychologically comfortable platform to foster social relationships and self-disclosure (*social compensation hypotheses*). Consequently, there should be a strong link among Facebooking, online social relationship satisfaction, and psychological well-being for introverts.

Based on previous research and our predictions, the following hypotheses were proposed:

H1: Facebooking is positively associated with users’ online social relationship satisfaction, and negatively associated with their offline social relationship satisfaction.

H2: Facebooking is both positively and negatively linked with users' psychological well-being through their online and offline social relationship satisfaction respectively.

H3a: Perceived social support mediates the relationships between online social relationship satisfaction or offline social relationship satisfaction and psychological well-being.

H3b: Social Interaction Anxiety mediates the relationships between online social relationship satisfaction or offline social relationship satisfaction and psychological well-being.

H4a: Associations among Facebooking, online social relationship satisfaction, and psychological well-being are stronger for introverts or neurotics than for extroverts or non-neurotics.

H4b: Associations among Facebooking, offline social relationship satisfaction, and psychological well-being are stronger for extroverts or non-neurotics than for introverts or neurotics.

Methods

Participants

Four hundred and five college students at Rutgers University participated in this study. Approval was obtained from the Rutgers University institutional review board. They completed a set of online questionnaires. Of those, 342 participants were included in the final analysis. Exclusion criteria included those who did not have a Facebook account, who did not agree for their data to be used, or who did not answer validation questions correctly. There were no missing data for all the variables. Each participant received 1 research credit for compensation. Power analysis revealed that the power of the final path model was .30 which indicated that it was moderately powerful to detect the close model fit ($df=5$, $N=342$, $\alpha=.05$) (MacCallum, Browne, & Sugawara, 1996)

Measures

Facebook Intensity. This construct was measured by a scale developed by Ellison et al. (2007) which assessed the extent that Facebook was used on a daily basis and how embedded Facebook was in an individual's social life (e.g., "*Facebook is part of my everyday activity*") (Cronbach's $\alpha = 0.84$). The Facebook Intensity scale is in the appendices along with the other measures.

Online and offline Social Relationship Satisfaction. Social Relationship Satisfaction is a 7-item scale that measures qualitatively and quantitatively a person's social network of relationships (Hendrick, 1988). All of the items within the scale were identical to the original version except social context was specified as either online or offline (i.e. on Facebook or in real life, see the modified full scale in appendix)

(Cronbach's alpha for online social relationship satisfaction = 0.82, Cronbach's alpha for offline social relationship satisfaction = 0.86).

Perceived Social Support. This is a 16-item measure (Cohen, Mermelstein, Kamarck, and Hoberman's, 1984) that asked people to report how easy it was to get tangible help, advice, emotional support, and companionship (e.g., "*There is someone I could turn to for advice about changing my job or finding a new one*") (Cronbach's alpha = 0.90).

Social Interaction Anxiety. This 19-item scale (SIAS) measured the extent to which individuals feel socially anxious in their social life (Mattick & Clarke, 1998). Sample items were "*I have difficulty talking with other people,*" and "*When mixing socially, I am uncomfortable*" (Cronbach's alpha = 0.93).

The Big Five Inventory. The 44-item big five personality test (John et al., 2008) includes scales that assess the personality traits of Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness. This measure was administered employing a 5-point Likert scale (Cronbach's alpha = 0.72).

Psychological Well-being. This 5-item scale (Diener et al., 1985) measured participants' general life satisfaction. Sample items are "*In most ways my life is close to my ideal*" and "*I am satisfied with my life*" (Cronbach's alpha = 0.86).

Procedure

Information about this study was posted online to recruit participants at Rutgers University. There were no exclusion criteria other than that the participant must have had

a Facebook account. At the time of sign-up, students did not know the true purpose of the study. The only information they were given was the name of the study (“Social Communication”) and that the study required completing questionnaires related to their social communication. All questionnaires were administered using Qualtrics. Participants were presented an online consent form and then proceeded to complete all the questionnaires. After participants submitted their answers, they were given an online version of a debriefing statement and the research credit.

Data Analysis

In an effort to examine the inter-relationships among psychological constructs simultaneously, structural equation modeling is a useful statistical technique to decompose the specific effects. Therefore, path analyses were performed to test possible causal pathways among the constructs. Personality differences were also assessed to determine whether specific relationships differ between extroverts and introverts, neurotics and non-neurotics. To examine the overall model fit, direct effects, and indirect effects simultaneously, path analyses were performed using AMOS which is a commonly used, user-friendly statistical software allowing us to test path models. The hypothesized model and an alternative model are shown in Figures 1 and 2 below.

The hypothesized path model was recursive and therefore identified ($df=5$). It was expected that Facebook use would have beneficial effects on psychological well-being through online social relationship satisfaction and detrimental effects through offline social relationship satisfaction. These effects were expected to be mediated by both perceived social support and social interaction anxiety. Chi-square test, Comparative Fit Index (CFI), Tucker-Lewis index (TLI) and Root Mean Square Error of Approximation

(RMSEA) were reported to assess the overall model fit. A non-significant chi-square ($p > .05$) (Barrett, 2007), CFI greater than .95 (Hu & Bentler, 1999), and RMSEA less than .05 (Hu & Bentler, 1999) would indicate a good fitting model. Unstandardized and standardized regression coefficients for each path were also examined to test the significance of the individual paths. P values less than .05 would indicate significant casual relationships. Moreover, a bootstrapping technique (bias-corrected confidence intervals) was adopted to test the significance of the indirect effects. Inclusion of 0 between the confidence intervals would indicate significant mediation effects (Jelenchick, Eickhoff, & Moreno, 2013). Finally, non-significant paths were trimmed out to provide the final model. An alternative plausible model was also tested (Figure 2). Facebook use could lead to increased or decreased psychological well-being through either perceived social support or social interaction anxiety first and then through either online or offline social relationship satisfaction. Because those two models were not nested, model comparisons using Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC) and Akaike's Bayesian Information Criterion (ABIC) techniques were also reported. A decrease of 10 or bigger would indicate a significantly improved model fit.

Results

Descriptive Statistics

Descriptive analyses showed that there were no missing data for all variables. Diagnostic analyses revealed that all data were normally distributed and had no positive or negative skewness or kurtosis (all values were between -1 and 1). On average, participants use Facebook to a moderate extent. They reported higher social relationship satisfaction in real life than on Facebook ($t=20.47$, $p<.001$). Participants also reported moderate levels of perceived social support, social interaction anxiety, and psychological well-being (for detailed descriptive statistics, see Table 1 in Appendix A).

Inter-Correlations among the Variables

The intensity of Facebook use was positively associated with users' online social relationship satisfaction ($r=.380$, $p<.01$), and psychological well-being ($r=.120$, $p<.05$), but did not directly correlate with users' offline social relationship satisfaction ($r=-.022$, ns), perceived social support ($r=.097$, ns), and social interaction anxiety ($r=.011$, ns). Participants' online social relationship satisfaction was also positively linked to their offline social relationship satisfaction ($r=.227$, $p<.01$), perceived social support ($r=.193$, $p<.05$), and psychological well-being ($r=-.150$, $p<.05$), but negatively associated with social interaction anxiety ($r=-.214$, $p<.01$) (See Table 2 for all zero-order correlations).

These results suggest direct social benefits of Facebook use. Increased Facebook use could lead to increased perceived social support, psychological well-being, and decreased social interaction anxiety. Results also suggested users' Facebook experiences were positively correlated with their real life social relationship satisfaction. In order to

examine the inter-relationships among those constructs simultaneously, path analyses were performed to decompose the associations by assessing the possible pathways among those variables.

Testing Path Models

Path analyses were performed to investigate the complex relationships among Facebooking, online and offline social relationship satisfaction, perceived social support, social interaction anxiety, and psychological well-being simultaneously. The final model (Figure 3) demonstrated pretty good overall fit to the covariance/correlation matrices ($\chi^2=6.980$, $df=5$, $p=.222$, $CFI=.995$, $TLI=.985$, $RMSEA=.034$).

Direct effects. Paradoxically, Facebooking simultaneously positively and negatively explained the variance of users' psychological well-being. Specifically, the intensity of Facebook use had direct positive effects on users' online SRS (Beta=.380, $B=.277$, $SE=.037$, $p<.01$) and perceived social support (Beta=.109, $B=.086$, $SE=.034$, $p<.05$), and negative direct effects on users' offline SRS (Beta=-.126, $B=-.089$, $SE=.040$, $p<.01$). Furthermore, users' SRS on Facebook also positively predicted their offline SRS (Beta=.275, $B=.266$, $SE=.055$, $p<.01$) and psychological well-being (Beta=.102, $B=.142$, $SE=.063$, $p<.05$), while user's SRS in real life positively predicted the level of perceived social support (Beta=.518, $B=.575$, $SE=.052$, $p<.01$) and negatively predicted the level of social interaction anxiety (Beta=-.393, $B=.515$, $SE=.065$, $p<.01$). Participants' degree of social interaction anxiety was negatively associated with their perceived social support (Beta=-.153, $B=-.130$, $SE=.040$, $p<.01$) and psychological well-being (Beta=-.254, $B=-$

.278, SE=.053, $p < .01$). Lastly, perceived social support had a strong positive relationship with users' psychological well-being (Beta=.384, B=.497, SE=.063, $p < .01$)

Indirect effects. Facebooking had indirect effects on users' psychological well-being mediated by online SRS, perceived social support, offline SRS, and social interaction anxiety. Bootstrapping mediation analyses suggested that the combination of those indirect effects were significant, 95% confidence interval (CI)=[.035-.145], $p = .001$). The intensity of Facebook use also indirectly predicted perceived social support and social interaction anxiety via offline SRS. Mediation analyses indicated that this indirect effect was also significant, 95% confidence interval (CI)=[.056-.734], $p = .001$). Moreover, offline SRS had indirect effects on psychological wellbeing through perceived social support and social interaction anxiety. Those joint mediation effects were significant, 95% confidence interval (CI)=[.002-.388], $p = .001$).

Taken together, these findings suggested an interesting social psychological phenomenon of Facebook paradox. Using Facebook intensively or becoming attached to Facebook can be both beneficial and detrimental depending on the online and offline social context. Specific explanations are discussed later.

Alternatively (Figure 2), the effects of Facebook use on individuals' psychological well-being may also function through users' perceived social support and social interaction anxiety, which in turn form different levels of social relationship satisfaction either online or offline. However, this alternative model did not demonstrate improved fit to the data compared with the final path model ($\chi^2 = 125.281$, $df = 5$, $p < .01$, CFI=.705, TLI=.115, RMSEA=.266) (as shown in Figure 4).

Comparisons of the competing models (hypothesized model of Figure 1, Final model of Figure 3 with the alternative model of Figure 2 and the trimmed alternative of Figure 4) indicated that the final model (Figure 3) had better fit than the alternative ones. AIC, BCC and BIC indices were much lower than the other alternative models (see Table 3).

Personality Differences

Multiple group comparisons were performed to examine whether there were any group differences between extraverts and introverts, neurotic and non-neurotics on individuals' social relationship satisfaction and psychological well-being as a function of Facebook intensity. Using pairwise parameter comparisons, results revealed that the association between online social relationship satisfaction and psychological well-being was stronger for introverts ($p < .05$). However, perceived social support and psychological well-being was stronger for extraverts ($p < .05$). No other path yielded significant differences between extroverts and introverts. Moreover, there were no significant differences found on any paths between neurotics and non-neurotics.

Demographic Differences

Multiple group comparisons results also indicated that there were no significant differences between male and female, different age and ethnic groups on the inter-relationships among Facebooking, social relationship satisfaction, perceived social support, social interaction anxiety, and psychological well-being.

Discussion

The aim of the study was to explore how Facebooking was associated with users' psychological well-being through their online and offline social relationship satisfaction, perceived social support, and social interaction anxiety, as well as whether there were personality differences on those effects. In general, results indicated that Facebooking could be beneficial to young adults' psychological well-being through online social relationship satisfaction, and simultaneously detrimental to users' psychological well-being through offline social relationship satisfaction (hypothesis 1 and 2 were supported). The overall findings were consistent with Sheldon et al.'s (2011) conclusions that Facebook use was both correlated with users' relatedness need-satisfaction and relatedness need-dissatisfaction. However, this study suggests that the Facebook Paradox effect can be teased apart by separating users' online and offline social context. Interestingly, online and offline are positively associated, which suggests that online and offline worlds are not independent but rather coexist, complement, and mutually construct and benefit each other.

Furthermore, only the effect of offline social relationship satisfaction on psychological well-being was mediated by perceived social support and social interaction anxiety (hypothesis 3a and 3b were partly supported). The link from online social relationship satisfaction to psychological well-being was direct and was not mediated by perceived social support and social interaction anxiety as hypothesized. One explanation is that satisfaction with social relationships on Facebook could directly contribute to increased psychological well-being, not necessarily via enhancing perceived social support and decreasing social interaction anxiety. Moreover, the items within those two

scales might have implied the context as offline because those two constructs emphasized the tangible social support and social anxiety during interpersonal (face-to-face) interaction.

Perceived social support also mediated the path between Facebooking and psychological well-being, which is consistent with Shaw and Grant (2002)'s findings. They reported that spending time online enhanced perceived social support, which then led to, increased psychological well-being. However, social interaction anxiety did not mediate Facebooking and psychological well-being which may suggest that using Facebook may not by itself buffer users' social interaction anxiety. Rather the positive feelings about Facebooking experience generate the benefit.

Personality Effects

There were some personality effects on the relationship between online social relationship satisfaction and psychological well-being with the link being stronger for introverts than extraverts. Introverted users were more satisfied with their online social relationship. In turn, gratification from Facebook social relationship directly contributed to users' psychological well-being which supported a compensatory function of Facebook (hypothesis 4a was partly supported). The association between perceived social support and psychological well-being was stronger for extraverts (hypothesis 4b was partly supported), suggesting extroverted Facebookers boost their psychological well-being by obtaining higher level of social support from Facebook. Although the findings of this study did not directly support the social enhancement hypotheses and social compensation hypotheses, the stronger link between perceived social support and

psychological well-being for extraverts which may be enhanced from their online to offline path implies Facebook as an enhancer. Moreover, the direct contribution of introverts' online social relationship satisfaction to their psychological well-being suggested Facebook could be a compensatory tool for its users.

Theoretical and Practical Implications

Previous studies have proposed several psychological mechanisms to explain the relationship between Facebook use and psychological well-being: displacement, Facebook envy, psychological inclination or augmentation hypothesis (Chen & Lee, 2013; Huang, 2010), social enhancement and social compensation hypotheses (Zywica & Danowski, 2008). To reconcile those competing explanations, this research proposes a "social complementarity" hypothesis in an effort to present a more holistic, dynamic view of the underlying psychological processes of Facebook paradox phenomena. This hypothesis claims that individuals' online and offline worlds coexist, complement, and mutually construct and reinforce each other. Developing online social relationships on Facebook expand users' social network and social capital, make them engage in social groups more actively, and promote self-presentational behavior, which benefits users' offline social relationship via obtaining richer information, facilitating deeper social interactions, and boosting social competence. Reinforcing offline social relationships offers individuals intimacy, interpersonal trust, and strong social ties, which help Facebook users maintain healthy, constructive social relationships online. Inspired by the Chinese philosophy of Yin and Yang, the natural principle is that two opposite and contradictory forces can coexist and complement one another rather than conflict with

and fight each other (Laozi, 6th BC). This framework would help us better understand the dynamics between online and offline social world and its implications for users' psychological well-being.

Contributions

First, findings from this research provide additional empirical evidence of the Facebook Paradox effect which asserts that Facebooking, in general, can be both beneficial and detrimental to users' psychological well-being. Second, by adopting the concept of online social relationship satisfaction, this study offers a more comprehensive theoretical framework that sheds light on new directions of dynamic interaction between online and offline worlds in Cyberpsychology research. Third, this study identifies the mediating roles perceived social support and social interaction anxiety play in the relationship between Facebooking and psychological well-being.

Limitations and Future Directions

First, the cross-sectional nature of the data places a limitation on making causal claims about the relationships among the constructs. Second, this research exclusively relied on self-report measures which may result in some inaccuracy and method bias. However, as Gosling et al. (2011) noted, for Facebook research, self-report data did not significantly differ from analyzing users' observed information on their Facebook profile. Third, the sample only included university students which reduced the generalizability of the findings. Although students are an appropriate group for studying online behavior

because they are “digital natives”, further studies should explore various age groups among other demographics.

Conclusions

Overall, findings of this study suggest that Facebooking can be both beneficial and detrimental for individuals' psychological well-being through online and offline social relationship satisfactions. Facebooking indirectly positively predicted users' psychological well-being through their online social relationship satisfaction or perceived social support, and negatively predicted users' psychological well-being through offline social relationship satisfaction, perceived social support, and social interaction anxiety. The association between online social relationship satisfaction and psychological well-being was stronger for introverts. However, the association between perceived social support and psychological well-being was stronger for extraverts. Attempting to disentangle the *Facebook Paradox*, results indicated that when and how Facebooking is helpful or harmful to users' social relationship satisfaction and psychological well-being depends on both user characteristics and online-offline social contexts.

Appendices

Appendix A: Table 1 through Table 3

Table 1: Descriptive Statistics of all Variables and Demographics

Demographics	M±SD /n (%)
Facebook intensity	3.33±.81
Online social relationship satisfaction	3.30±.59
Offline social relationship satisfaction	4.09±.57
Perceived social support	4.12±.63
Social interaction anxiety	2.32±.75
Psychological Well-being	3.25±.82
Age	19.82±2.16
Gender:	
Male	98 (29%)
Female	244 (71%)
Ethnicity:	
Caucasian/white	46.8%
Hispanic/Latino	10.2%
Asian/Asian American	14.9%
African American	5.8%%
Native American/Alaskan native	3.5%
Multiracial	2.6%

Table 2: Zero-order Correlation Matrix

	Facebook Intensity (FI)	Facebook SRS (F-SRS)	Real life SRS (RL- SRS)	Perceived Social Support (PSS)	Social Interaction Anxiety (SIA)	Psychological Well-being (PWB)
FI	-	.380**	-.022	.097	.011	.120*
F-SRS		-	.227**	.193*	-.150*	.214**
RL-SRS			-	.576**	-.393**	.404**
PSS				-	-.356*	.493*
SIA					-	-.405**
PWB						-

SRS abbreviates social relationship satisfaction

**Indicates correlation is significant at the .01 level (2-tailed).

* Indicates correlation is significant at the .05 level (2-tailed).

Table 3: Model Comparisons and Fit Statistics

Model	Chi-square/ df	P value	CFI	TLI	RMSE A	AIC	BCC	BIC
Final Model	1.40	.222	.995	.985	.034	38.98	39.65	100.34
Hypothesized model	.96	.377	1.000	1.001	.000	39.95	40.75	112.81
Hypothesized alternative Model	2.31	.099	.994	.952	.062	42.626	43.422	134.487
Trimmed Alternative model	25.06	<.01	.705	.115	.266	157.28	157.95	218.64

Appendix B: Figure 1 through Figure 4

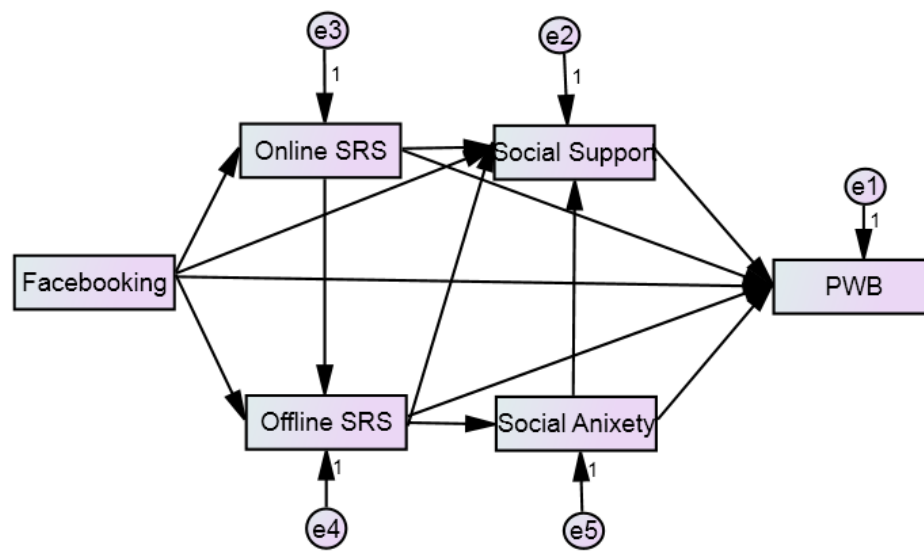


Figure 1: The Hypothesized Model of the Effects of Facebooking on Individuals' Social Relationships and Psychological Well-being

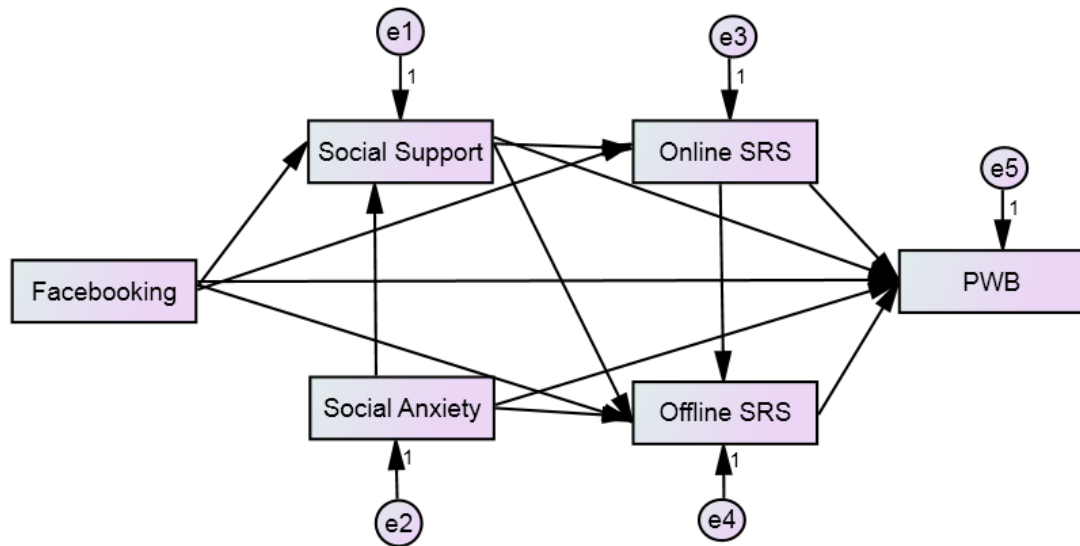


Figure 2: A Hypothesized Alternative Model of the Effects of Facebooking on Individuals' Social Relationships and Psychological Well-being

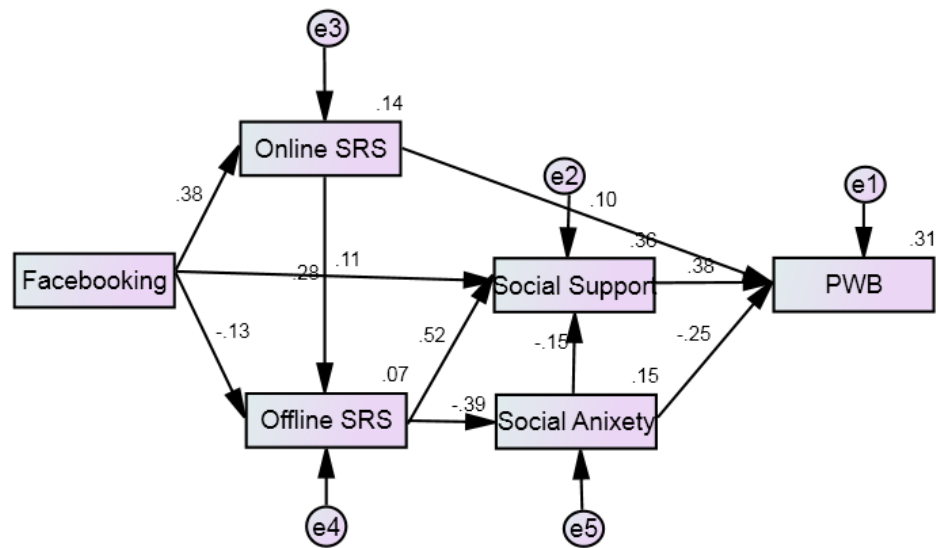


Figure 3: The Trimmed Model of the Effects of Facebooking on Individuals' Social Relationships and Psychological Well-being

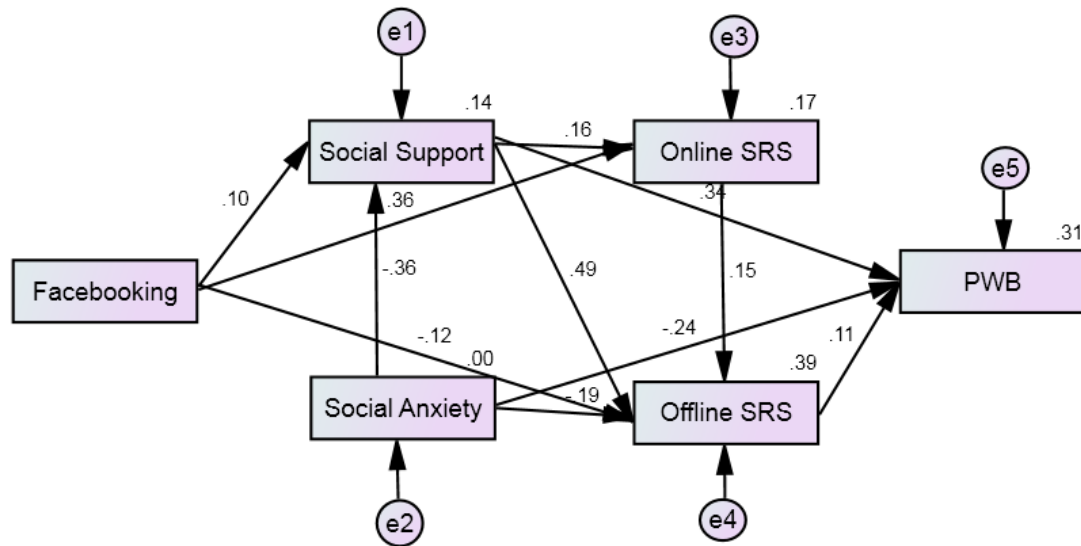


Figure 4: The Trimmed Alternative Model of the Effects of Facebooking on Individuals' Social Relationships and Psychological Well-being

Appendix C: Facebook Intensity Scale

Please answer the following questions regarding your Facebook usage and friends. If you cannot remember exactly, you may log on to your Facebook account and take a look to make sure the numbers are accurate. However, please return to the questionnaire immediately after you find the relevant information.

- 1) How many Facebook friends do you have?_____
- 2) How many Facebook friends do you interact with several times a week on Facebook?_
- 3) How many Facebook friends are your family members?_____
- 4) How many Facebook friends do you regard as close friends? _____
- 5) How many Facebook friends do you regard as casual friends?_____
- 6) How many Facebook friends do you regard as acquaintances?_____
- 7) How many Facebook friends do you regard as “strangers” whom you actually don’t know?_____
- 8) How many Facebook friends do you also interact with offline?_____
- 9) How many Facebook friends do you interact with several times a week offline?_____

(The following items all will use 5 point Likert scale, strongly disagree to strongly agree)

- 10) Facebook is part of my everyday activity
- 11) I am proud to tell people I’m on Facebook
- 12) Facebook has become part of my daily routine
- 13) I feel out of touch when I haven’t logged onto Facebook for a while
- 14) I feel I am part of the Facebook community
- 15) I would be sorry if Facebook shut down

Appendix D: Social Relationship Satisfaction Scale

Instructions: Please read each item carefully and answer the following questions based on your true feelings.

1. How well do your Facebook friends meet your relationship needs in Facebook interaction?

1 2 3 4 5

Not well

Very well

2. In general, how satisfied are you with the relationship with your Facebook friends?

1 2 3 4 5

Not satisfied

Very satisfied

3. How good is your relationship with your Facebook friends?

1 2 3 4 5

Not good

Very good

5. To what extent has your relationship with your Facebook friends met your expectations?

1 2 3 4 5

Not at all

Very much

6. How much do you love your Facebook friends?

1 2 3 4 5

Not much

Very much

7. How many problems have you had in your relationship with your Facebook friends?

1 2 3 4 5

Not much

Very many

8. Do you interact with your Facebook friends on Facebook frequently?

1 2 3 4 5

Very infrequently

Very frequently

9. Do you experience deep feelings with your Facebook friends when you interact with them on Facebook?

1 2 3 4 5

Very deep

Very superficial

10. Do you share many types of information with your Facebook friends on Facebook?

1 2 3 4 5

Not many

Very many

11. How many friends do you have in real life (offline)?_____

12. How many of your real life friends do you interact with several times a week? (Both via face- to-face and phone count)_____

14. How many of your real life friends do you regard as close friends? _____

15. How many of your real life friends do you regard as casual friends? _____

16. How many of your real life friends do you regard as acquaintances? _____

17. How well do your real life friends meet your relationship needs in face-to-face interaction?

1 2 3 4 5

Not well

Very well

18. In general, how satisfied are you with your relationship with your real life friends in face-to-face interaction?

1 2 3 4 5

Not satisfied

Very satisfied

19. How good is your relationship with your real life friends in face-to-face interaction?

1 2 3 4 5

Not good

Very good

20. To what extent has your relationship with your real life friends met your expectations in face-to-face interaction?

1 2 3 4 5

Not at all

Very much

21. How much do you love your real life friends in your face-to-face interaction?

1 2 3 4 5

Not much

Very much

22. How many problems have you had in your relationship with your real life friends in face-to-face interaction?

1 2 3 4 5

Not many

Very many

23. Do you interact with your real life friends frequently in face-to-face interactions?

1 2 3 4 5

Very infrequently

Very frequently

24. Do you experience deep feelings with your real life friends when you interact with them face-to-face?

1 2 3 4 5

Very deep

Very superficial

25. Do you share many types of information with your real life friends in face-to-face interaction?

1 2 3 4 5

Not many

Very many

Appendix E: Perceived Social Support Scale

Instructions: Please read each statement carefully, and indicate to what extent you agree or disagree with each statement.

1. There is a special person who is around when I am in need.

1 2 3 4 5

Strongly Disagree Mildly Disagree Neutral Mildly Agree Strongly Agree

2. There is a special person with whom I can share my joys and sorrows.

1 2 3 4 5

Strongly Disagree Mildly Disagree Neutral Mildly Agree Strongly Agree

3. My family really tries to help me.

1 2 3 4 5

Strongly Disagree Mildly Disagree Neutral Mildly Agree Strongly Agree

4. I get the emotional help and support I need from my family.

1 2 3 4 5

Strongly Disagree Mildly Disagree Neutral Mildly Agree Strongly Agree

5. I have a special person who is a real source of comfort to me.

1 2 3 4 5

Strongly Disagree Mildly Disagree Neutral Mildly Agree Strongly Agree

6. My friends really try to help me.

1 2 3 4 5

Strongly Disagree Mildly Disagree Neutral Mildly Agree Strongly Agree

7. I can count on my friends when things go wrong.

1 2 3 4 5

Strongly Disagree Mildly Disagree Neutral Mildly Agree Strongly Agree

8. I can talk about my problems with my family.

1 2 3 4 5

Strongly Disagree Mildly Disagree Neutral Mildly Agree Strongly Agree

9. I have friends with whom I can share my joys and sorrows.

1 2 3 4 5

Strongly Disagree Mildly Disagree Neutral Mildly Agree Strongly Agree

10. There is a special person in my life who cares about my feelings.

1 2 3 4 5

Strongly Disagree Mildly Disagree Neutral Mildly Agree Strongly Agree

11. My family is willing to help me make decisions.

1 2 3 4 5

Strongly Disagree Mildly Disagree Neutral Mildly Agree Strongly Agree

12. I can talk about my problems with my friends.

1

2

3

4

5

Strongly Disagree Mildly Disagree Neutral Mildly Agree Strongly Agree

Appendix F: Satisfaction With Life Scale (SWLS)

Instructions: Below are five statements that you may agree or disagree with. Using the 1 - 7 scale below, indicate your agreement with each item by placing the appropriate number on the line preceding that item. Please be open and honest in your responding.

- 5 - Strongly agree
- 4 - Agree
- 3 - Neither agree nor disagree
- 2 - Disagree
- 1 - Strongly disagree

____ In most ways my life is close to my ideal.

____ The conditions of my life are excellent.

____ I am satisfied with my life.

____ So far I have gotten the important things I want in life.

____ If I could live my life over, I would change almost nothing.

Appendix G: The Big Five Personality Test (BFI)

Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who likes to spend time with others? Please write a number next to each statement to indicate the extent to which you agree or disagree with that statement.

I see myself as someone who...

- ___1. Is talkative
- ___2. Tends to find fault with others
- ___3. Does a thorough job
- ___4. Is depressed, blue
- ___5. Is original, comes up with new ideas
- ___6. Is reserved
- ___7. Is helpful and unselfish with others
- ___8. Can be somewhat careless
- ___9. Is relaxed, handles stress well
- ___10. Is curious about many different things
- ___11. Is full of energy
- ___12. Starts quarrels with others

- ___13. Is a reliable worker
- ___14. Can be tense
- ___15. Is ingenious, a deep thinker
- ___16. Generates a lot of enthusiasm
- ___17. Has a forgiving nature
- ___18. Tends to be disorganized
- ___19. Worries a lot
- ___20. Has an active imagination
- ___21. Tends to be quiet
- ___22. Is generally trusting
- ___23. Tends to be lazy
- ___24. Is emotionally stable, not easily upset
- ___25. Is inventive
- ___26. Has an assertive personality
- ___27. Can be cold and aloof
- ___28. Perseveres until the task is finished
- ___29. Can be moody

- ___30. Values artistic, aesthetic experiences
- ___31. Is sometimes shy, inhibited
- ___32. Is considerate and kind to almost everyone
- ___33. Does things efficiently
- ___34. Remains calm in tense situations
- ___35. Prefers work that is routine
- ___36. Is outgoing, sociable
- ___37. Is sometimes rude to others
- ___38. Makes plans and follows through with them
- ___39. Gets nervous easily
- ___40. Likes to reflect, play with ideas
- ___41. Has few artistic interests
- ___42. Likes to cooperate with others
- ___43. Is easily distracted
- ___44. Is sophisticated in art, music, or literature

Appendix H: Social Interaction Anxiety Scale (SIAS)

Instructions: For each item, please circle the number to indicate the degree to which you feel the statement is characteristic or true for you. The rating scale is as follows:

0 = Not at all characteristic or true of me.

1 = Slightly characteristic or true of me.

2 = Moderately characteristic or true of me.

3 = Very characteristic or true of me.

4 = Extremely characteristic or true of me.

1. I get nervous if I have to speak with someone in authority (teacher, boss, etc.).

2. I have difficulty making eye contact with others.

3. I become tense if I have to talk about myself or my feelings.

4. I find it difficult to mix comfortably with the people I work with.

5. I find it easy to make friends my own age.

6. I tense up if I meet an acquaintance in the street.

7. When mixing socially, I am uncomfortable.

8. I feel tense if I am alone with just one other person.

9. I am at ease meeting people at parties, etc.

10. I have difficulty talking with other people.

11. I find it easy to think of things to talk about.
12. I worry about expressing myself in case I appear awkward
13. I find it difficult to disagree with another's point of view
14. I have difficulty talking to attractive persons of the opposite sex.
15. I find myself worrying that I won't know what to say in social situations.
16. I am nervous mixing with people I don't know well.
17. I feel I'll say something embarrassing when talking.
18. When mixing in a group, I find myself worrying I will be ignored.
19. I am tense mixing in a group.
20. I am unsure whether to greet someone I know only slightly.

Appendix I: Demographics

Instructions: We would now like to get some information about you and your background.

What is your ethnic background?

- White
- Black/African American
- Hispanic/Latino
- Native American
- Middle Eastern/North African
- South Asian (e.g., Indian, Pakistani, Bangladeshi, Afghan, Sri Lankan)
- East Asian (e.g., Chinese, Korean, Japanese)
- Southeast Asian (e.g., Vietnamese, Laotian, Cambodian; Indonesian, Filipino)
- Pacific Islander (e.g., Micronesian, Melanesian, Polynesian)
- Other Asian
- Multiracial
- Other _____

Gender:

- Male
- Female

What is your age? _____

What year are you in school?

a) Freshman b) Sophomore c) Junior d) Senior e) Others, please specify_____

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