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## I Want You to Like Me: Extraversion, Need for Approval, and Time on Facebook as Predictors of Anxiety

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### Abstract

Although social networking sites such as Facebook have been touted as creating a global village, there may be a downside to such computer-mediated interactions on user's well-being. One such consequence is that stimuli via computer-mediated interactions may be anxiety-provoking for some users. As such, recent studies have tried to ascertain personality factors and individual differences that are associated with higher anxiety in connection with extensive Facebook use. The current study evaluated the relationships among extraversion, time on Facebook, need for approval, and anxiety among college students (N=280). Results revealed that need for approval significantly moderated the association between extraversion and anxiety. Specifically, individuals higher in extraversion tended to be less anxious, although this was less true for those extraverts who were higher in need for approval. Further, this moderating effect was stronger among extraverts who were high in need for approval and spent more time on Facebook relative to those who spent less time on Facebook. The present research contributes to the emerging literature by providing evidence regarding how personality factors interact with Facebook usage.

### Keywords

health; internet/cyberpsychology; individual differences; personality; social networking

### 1. Introduction

The emergence of new technology presents a unique opportunity for researchers to study interactions between people in a new light. Anxiety, personality traits, and the need for other's approval has been studied extensively in interpersonal relationships in a face-to-face context, but social networking sites offer a new type of interactions that shed further light on the contributions of these constructs to people's attitudes, behaviors, and emotions. Facebook in particular is a key element of modern interactions, as it has been reported to be utilized by 1.11 billion users (Michikyan, Subrahmanyam, & Dennis, 2014), and is the second most visited page on the internet (Ryan & Xenos, 2011). Facebook is especially useful for further elucidating the effects of established constructs; it is somewhat distinct from other social sites in that it primarily involves relationships that were formed as face-to-face interactions, as opposed to the primarily digital interactions (Ross et al., 2009). Another 2009 qualitative study even suggested that Facebook may be having a profound effect on the way that people

interact and communicate with each other (Richardson & Hessey, 2009). Thus, interactions on Facebook are an important avenue of study.

Determining the underlying causes and significant correlates of anxiety, as well as possible interventions to reduce anxiety, have been goals of researchers for over a century. Past research has shown that anxiety differentially affects individuals with specific personality characteristics, such as neuroticism and extraversion, and can influence their interactions with other people (Vreeke & Muris, 2012). Much of this research, however, has been done in the context of face-to-face interactions. The emergence of new technology introduces additional domains in which anxiety can play a role, and the established relationships between anxiety and other factors, such as personality types, may interact differently in the “digital age”. Thus far, studies that examined such interactions between personality factors and anxiety in the context of internet communications have produced mixed findings. Extraversion in particular has been studied in the context of Facebook use (i.e., Seidman, 2012; Andreassen et al., 2013), but no clear conclusions have been reached as to its outcomes on health and well-being. The mixed results with regards to extraversion in online contexts may be due to additional factors not accounted for in previous research, such as need for approval. The present study seeks to determine how extraversion, time spent on Facebook, and need for approval interact to produce greater anxiety among college students.

Defined as an emotional state accompanied by feelings of apprehension, tension, nervousness, and worry (Spielberger, 2010), anxiety has often been characterized as either state or trait. State anxiety is temporally-based, and consists of experiencing feelings of tension, apprehension, nervousness, and worry that occur in response to a particular stimulus or situation (Cattell & Scheier, 1961). Trait anxiety, on the other hand, is a more stable, dispositional tendency to interpret situations and stimuli as threatening, and to respond with anxiety (Spielberger, Gorsuch, & Lushene, 1970; Spielberger & Sydeman, 1994).

Although the causes for anxiety (whether state or trait) are not well understood, it has been linked to a wide variety of health and well-being outcomes such as increased somatic symptoms, heart disease, diabetes, and asthma (Di Marco, Santus, & Centanni, 2011; Yohannes, 2010; Haug, Mykletun, & Dahl, 2004), as well as trauma and stressful life experiences (Berrios, 1999). Spielberger and Reheiser (2009) specifically note that anxiety can stem from feelings of inadequacy with regards to interpersonal relationships, introducing the possibility that need for approval from other people may provoke anxiety. Given this supposition, it may be beneficial to examine personality factors that are most closely related to those qualities. Personality factors have often been studied in anxiety research; in fact, researchers have expressed the belief that personality factors are useful predictors that link individuals to specific psychological disorders such as depression and anxiety (e.g., Boyce, Parker, Bamett, Cooney, & Smith, 1991; Widiger & Trull, 1992). Out of the five main personality factors, we elected to examine the trait that specifically informs an individual's preferences for interactions with other people: extraversion.

Extraversion is not typically associated with anxiety. In fact, most research demonstrates that extraversion predicts positive effects such as happiness (Cheng & Furnham, 2003) and positive affect (Watson, Wiese, Vaidya, & Tellegen, 1999), and that it is negatively

associated with depression (Cheng & Furnham, 2003; Clark, Watson, & Mineka, 1994). Introversion, on the other hand, has been theoretically linked to anxiety. Researchers have posited that introverts are often more susceptible to punishment cues and less susceptible to reward cues, and that the greater arousal associated with introverted social interaction leads to greater amounts of anxiety, as introverts are less able to detect when they are garnering approval from others (Eysenck & Eysenck, 1985; Eysenck, 1987; Gray, 1981, 1987; Zinbarg & Reville, 1989). Thus, need for approval from others could potentially moderate the relationship between extraversion and anxiety such that introverts experience more anxiety than extraverts.

The relationship between need for approval from others and anxiety is also well-rooted in past literature. For those with high need for approval, their self-esteem is correlated with how positively they believe others perceive them (for reviews, see Shrauger & Schoeneman, 1979; Wylie, 1979). Research into the relationship between need for approval and personality characteristics has shown that need for approval is negatively correlated with neuroticism and self-esteem, and is positively associated with depressive symptoms (Crocker & Luhtanen, 2003; Crocker, Luhtanen, Cooper, & Bouvrette, 2003; Cambron, Acitelli, & Steinberg, 2010). Contingent self-esteem, self-esteem that is based on external factors, can occur in many different domains (e.g., romantic relationships or friendships) and promotes anxiety and tension within the contingent domain (Deci & Ryan, 2000). Thus, those individuals who have high need for approval may place a great deal of importance on interpersonal interactions, which would lead to greater anxiety. Most of the past research, however, focuses primarily on face-to-face interpersonal relationships. Few studies have been conducted to explore how these concepts might interact in an online forum.

The average individual spends about 55 minutes a day using Facebook to interact digitally with friends and acquaintances (Facebook, 2011). The pervasiveness of online social interactions on sites such as Facebook underscore the importance of exploring how personality types and individual differences respond to such use, and how it might predict their overall health and well-being. Previous work has focused primarily on social anxiety, suggesting that technological formats are more comfortable interactive forums for those with high social anxiety (Pierce, 2009), and may be used as a compensatory measure (Campbell, Cumming, & Hughes, 2006; Desjarlais & Willoughby, 2010). Additionally, Facebook use has also previously been linked to personality traits. For instance, Ryan and Xenos (2011) found that there was a positive association between the amount of time spent on Facebook and neuroticism. Seidman (2012) demonstrated that extraversion was associated with more frequent use of Facebook to communicate with others. However, Andreassen et al. (2013) found that this attention-seeking can have negative results, namely predicting Facebook addiction in those higher in extraversion. The literature has yet to examine potential moderating factors, such as need for approval, which may help to explain why extraversion appears protective of anxiety and yet interacts unexpectedly in online forums.

The current study evaluated the relationships among extraversion, time on Facebook, need for approval, and anxiety among undergraduate students. We specifically focus on trait anxiety as opposed to state anxiety, as trait anxiety is considered more stable rather than temporal and therefore may be less likely to be dependent on the participants' affect at the

time of the study. Based on previous research, we hypothesize main effects such that extraversion will be negatively associated with anxiety; need for approval and time on Facebook will each be positively associated with anxiety.

We further predict that extraversion and need for approval will interact to predict anxiety such that extraversion will be negatively related to anxiety (consistent with past research), but this will be less true among extraverts higher in need for approval. In addition, we hypothesize that need for approval and time spent on Facebook will interact to predict anxiety, such that need for approval will be positively related to anxiety, particularly among individuals who spend greater amounts of time on Facebook. Finally, we posit that the need for approval will moderate the association between extraversion and anxiety such that extraversion will be negatively associated with anxiety, but this will be less true among extraverts who are higher in the need for approval. Furthermore, we expect this moderating effect to be more evident among extraverts who spend greater amounts of time on Facebook compared to those who spend lower amounts of time on Facebook.

## 2. Materials and Methods

### 2.1 Participants and Procedure

Two hundred eighty undergraduates (Mean age = 23.35,  $SD = 5.88$ ; 70% female) from a large southern university participated in the study. The sample was racially diverse and consisted of 29.6% Caucasian, 14.8% African American, 18.7% Asian American, 28.5% Hispanic, 3.2% Middle Eastern, 4.9% Multiracial, and .3% Native American participants. Participants were recruited through classes or via flyers containing study information posted around campus. Study materials were completed online in a single session and participants received extra credit for participation.

### 2.2 Measures

**2.2.1 Demographics**—Participants reported demographic information such as age, gender, and racial background.

**2.2.2 Extraversion**—Extraversion was assessed using the Big-Five Inventory (BFI; John, Donahue, & Kentle, 1991). This 44-item scale asks 8 questions about how extraverted individuals perceive themselves to be (e.g., I see myself as someone who is talkative). Response options range from 1 (*Disagree strongly*) to 5 (*Agree strongly*) ( $\alpha = .84$ ).

**2.2.3 Need for Approval**—The Approval from Others subscale from the Contingencies of Self-worth scale (Crocker et al., 2003) was used to determine how important others' approval is to one's sense of self. Five items assessed the importance of gaining approval from others with regards to how one views one's self ( $\alpha = .73$ ). Response options ranged from 1 (*strongly disagree*) to 7 (*strongly agree*).

**2.2.4 Trait Anxiety**—The trait anxiety subscale of the State-Trait Anxiety Inventory (STAI; Spielberger et al., 1970) consists of 20 items designed to evaluate trait levels of anxiety. The subscale measures tendencies toward feelings of tension, apprehension,

nervousness, and worry. Items are measured on a 4-point Likert scale with responses ranging from 1 (*almost never*) to 4 (*almost always*) ( $\alpha = .92$ ).

**2.2.5 Time on Facebook**—Time on Facebook was measured via one item which asked participants “How long on average do you spend per day on Facebook?” Participants could choose from seven possible answer choices ranging from 1 (*Less than 5 minutes*) to 7 (*5+ hours*).

### 3. Results

#### 3.1 Descriptive statistics

Table 1 presents means, standard deviations, and zero-order correlations for each of the variables. Anxiety was positively related to time on Facebook ( $r = .19, p < .05$ ) and need for approval ( $r = .22, p < .001$ ), and was negatively associated with extraversion ( $r = -.39, p < .001$ ). There were no other significant correlations.

#### 3.2 Primary analyses

A series of hierarchical regression analyses were conducted to examine the role of extraversion, need for approval, and time on Facebook in predicting anxiety. All variables were mean centered. Main effects were entered first into Step 1. Our hypothesis that extraversion would negatively predict anxiety, while controlling for the other predictors (need for approval and time on Facebook) was supported,  $\beta = -.36, p < .0001$ . Furthermore, our hypothesis that need for approval would positively predict anxiety, while controlling for the other predictors, was supported,  $\beta = .18, p < .001$ . Our final main effect hypothesis that time on Facebook would positively predict anxiety, while controlling for the other predictors, was also supported,  $\beta = .15, p < .01$ . Results are shown in Table 2.

The two-way interactions were tested by evaluating two-way product terms at Step 2 in predicting anxiety. We tested the hypothesis that extraversion and need for approval would interact to predict anxiety such that extraversion would be negatively related to anxiety; however, this effect would be weaker among extraverts higher in need for approval. Results revealed that the two-way interaction was significant,  $\beta = .14, p = .008$ . As evident in Figure 1, anxiety levels were lower for those higher in extraversion, although this was less true for extraverts who were higher in need for approval. Moreover, anxiety levels were higher for those lower in extraversion regardless of need for approval. Interactions were graphed using parameter estimates from the regression equation where high and low values were specified as one standard deviation above and below their corresponding means (Cohen, Cohen, West, & Aiken, 2003). A test of the simple slopes revealed that the slopes for both lines were significant.

We also tested our second two-way interaction hypothesis that time on Facebook and need for approval would interact to predict anxiety such that need for approval would be positively related to anxiety, particularly among individuals who spend greater amounts of time on Facebook; however, the two-way interaction between time on Facebook and need for approval was not significant,  $\beta = .02, p = .69$ . Thus, anxiety levels did not appear to differ for individuals who spent less or greater amounts of time on Facebook or among those

who were higher or lower in need for approval (see Table 2). In order to elucidate the role that Facebook usage plays between in the association between extraversion and need for approval in predicting anxiety, we conducted additional analyses with Facebook time was entered into the regression model as a predictor.

Our three-way interaction hypothesis examined whether need for approval would moderate the association between extraversion and anxiety such that extraversion would be negatively related to anxiety, although this would be less true among extraverts higher in need for approval, and this moderating effect would be stronger among those who spend greater amounts of time on Facebook. When analyzed, a significant three way interaction emerged,  $\beta = .13, p = .02$  (see Table 2). Results supported our hypothesis. Furthermore, the test of the simple slopes revealed that both slopes for low Facebook time were significant. For those who spend greater amounts of time on Facebook, only the slope for low need for approval was significant (see Figure 2).

#### 4. Discussion

This study evaluated relationships between extraversion, time on Facebook, need for approval, and trait anxiety among college students. Consistent with expectations, we found that extraversion was negatively associated with trait anxiety. As previously discussed, individuals who are higher in extraversion tend to be more positive, energetic, and enthusiastic (Enns & Cox, 1997), and also less anxious in general (Loo, 1979). Conversely, this result could also be interpreted as those low in extraversion (e.g., introverts) may possess higher levels of trait anxiety in general. One possible explanation is that introverts may have less of an outlet to express their thoughts and thus, may ruminate more than extraverts, contributing to higher levels of trait anxiety. Further, persistent feelings of unease in social situations may also account for higher levels of trait anxiety among introverts. Thus, additional work is needed to understand underlying mechanisms that may influence these relations, as well as to elucidate temporal relationships among extraversion, anxiety, and time spent on social media.

Also consistent with expectations, we found that need for approval was positively associated with anxiety. This indicates that the more an individual needs approval from others, the more anxious they tend to be (Deci & Ryan, 2000). This is consistent with the perspective that deriving one's self-worth from other's approval is an external contingency that one cannot control (Crocker, et al., 2003). Additionally, we expected that time spent on Facebook would be positively associated with anxiety, and our findings supported this prediction. It seems plausible that this relationship may go in either directional, or that it may be bi-directional. In other words, it is possible that excessive time spent on Facebook reinforces one's general tendency toward experiencing anxiety, and it is also possible that high levels of trait anxiety lead to spending more time on Facebook in efforts to obtain social validation. To determine the direction of this relationship and also to identify potential processes that may influence it over time, longitudinal examinations are needed. It is worth noting that previous work has found that greater time spent on Facebook is linked with negative health outcomes, including depressive symptoms (Steers, Wickham, & Acitelli, 2014). Social comparison has been theorized as the underlying mechanism for the association between time on Facebook and

depressive symptoms (Steers et al., 2014). Therefore, it stands to reason that a similar process could be operating in the present sample, to increase levels of anxiety. That is, comparing one's self to one's friends' and family's successes posted on Facebook may amplify one's general tendency towards experiencing anxiety. It is also possible that fear of negative evaluation by one's Facebook friends could exacerbate anxiety. This would be consistent with evidence indicating that fear of negative evaluation produces social anxiety (for a review, see Flett & Hewitt, in press). Furthermore, those who spend more time on Facebook may perceive Facebook as a primary source of validation from others. Thus, if one does not receive positive and/or instantaneous feedback to one's posts this could elevate anxiety levels. Possible evidence for this effect is found in previous literature which revealed that anxiety was correlated with loneliness (Clayton, Osborne, Miller, & Oberle, 2013). Researchers postulated that anxious individuals may form emotional attachments via Facebook in order to fulfill their need for connectedness (Clayton, et al., 2013).

In addition to the above, we hypothesized that extraversion and need for approval would interact to predict anxiety. This hypothesis was supported such that extraversion was negatively related to anxiety, although this was less true for extraverts higher in need for approval. It appears that anxiety levels do not change significantly among individuals lower in extraversion (e.g., introverts) regardless of level of need for approval. That is, introverts tend to have higher levels of trait anxiety regardless of their level of need for approval. Although introverts may still experience higher anxiety relative to extraverts (Eysenck & Eysenck, 1985; Eysenck, 1987; Gray, 1981,1987; Zinbarg & Reville, 1989), the literature shows that introverts may prefer computer-mediated interactions since they appear to experience less anxiety communicating with others via Facebook compared to face-to-face interactions (Rice & Markey, 2009).

Generally, extraversion serves as a buffer for anxiety in offline interpersonal relations. However, as previously noted, the relationship between extraversion and anxiety in online contexts is unclear. Results from the present study revealed that anxiety levels appeared to be more negatively associated with extraversion but this is less true for extraverts who are higher in need for approval (see Figure 1). Extraverts may utilize Facebook as another means of fulfilling core belongingness needs. However, we speculate that extraverts who are higher in need for approval may not be able to garner the same attention online that they normally receive in face-to-face contexts. The format of Facebook restricts users to interact according to pre-specified templates (e.g., status updates, uploading photos, posting comments on walls). Thus, extraverts who are higher in need for approval, may be less able to attract validation because they are competing with other users for attention from Facebook friends. This, in turn, may lead these individuals to feel more anxious.

Although our previous hypothesis was supported, the data did not support our expectation that need for approval and time on Facebook would interact to predict anxiety, such that need for approval would be positively related to anxiety, particularly among individuals who spend greater amounts of time on Facebook. It is possible that this interaction was not significant because individuals with higher need for approval may be more anxious in face-to-face contexts relative to online contexts. Further, it is possible that those who are higher in

need for approval may intentionally avoid social interactions on Facebook, which may explain why this relationship did not emerge.

We further expected that need for approval would moderate the association between extraversion and time on Facebook in predicting anxiety. This three-way interaction hypothesis was supported. Extraversion was negatively associated with anxiety, though this effect was less true among extraverts higher in need for approval. Further, this moderating effect was stronger among extraverts who spent greater amounts of time on Facebook relative to those who spent less time on Facebook. Consistent with the significant two-way interaction, results demonstrated that anxiety levels appeared to be about the same for those lower in extraversion (i.e., introverts), regardless of their need for approval and irrespective of the amount of time they spent on Facebook. Conversely, higher extraversion was associated with lower anxiety among those spending more time on Facebook, but this was less true for extraverts high in need for approval. These findings imply that extraverts who are higher in need for approval may spend more time on Facebook. Further, this greater Facebook use might attenuate any possible buffering effect of extraversion on the individual's general tendency toward experiencing anxiety. Facebook provides a unique online platform for individuals to fulfill their need for approval; however, it is possible that the detrimental effect of this social evaluative context may outweigh any potential perceived benefits of social validation.

The strengths of this research should be considered in light of its limitations. The first limitation relates to the sample, in that participants were comprised of undergraduate students. Although Facebook use is prevalent among college students, these findings may not be generalizable to other populations. Additionally, the cross-sectional design of this research does not allow for following trajectories over time. Furthermore, the correlational nature of these data does not allow us to infer causality. Relatedly, Facebook use was measured via self-report which may be subject to participant reporting bias.

In terms of future directions, additional research is needed to examine other potential individual differences which play a role in how Facebook use affects different personalities. It would also be worthwhile to examine anxiety at the state level as a function of time spent on Facebook using ecological momentary assessments. Future studies might also examine the interaction between types of Facebook use and personality factors and how they relate to positive and negative health outcomes. Additionally, researchers might seek to elucidate the underlying mechanisms, such as social comparison as was postulated in the present study, as potential mediators of the associations between personality factors and anxiety in the context of Facebook use. It is also important to note that longitudinal examinations of these processes are needed in order to determine temporal precedence.

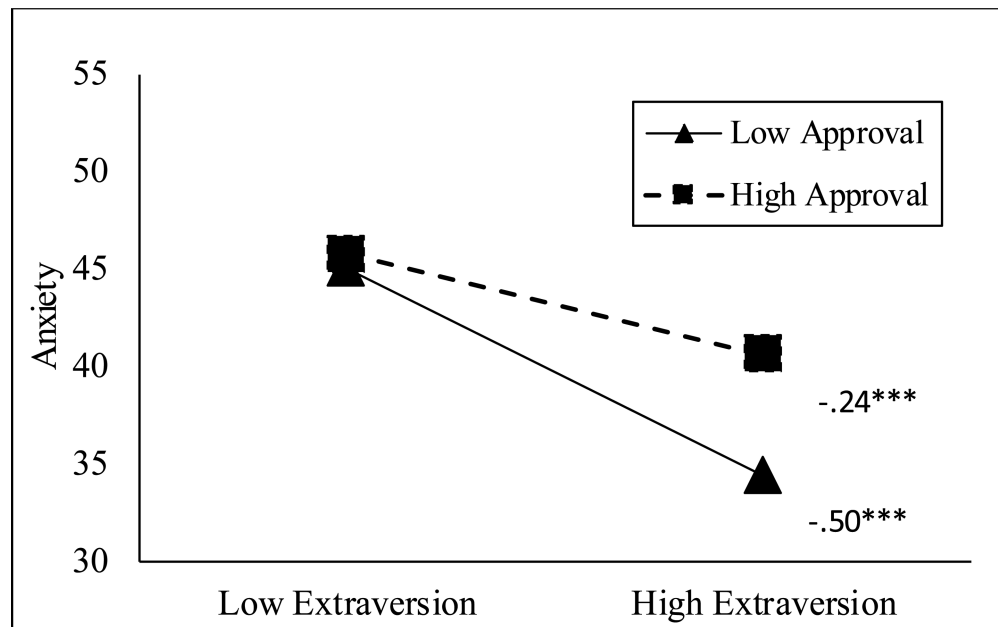
In conclusion, this research contributes to the emerging social media literature by providing evidence regarding how different personality factors respond to Facebook usage. Facebook and other social media sites continue to grow in popularity and play a prominent role in daily life. Although these types of online social interactions are becoming more pervasive, the effects of such technology-based communications are still unclear and the long-term psychological consequences warrant further investigation.



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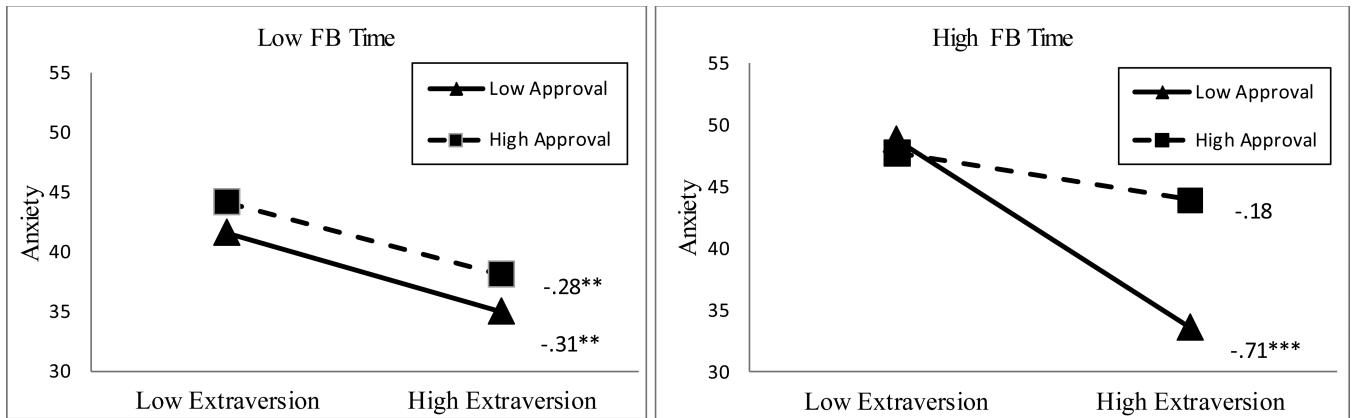
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**Figure 1.**

This two-way interaction demonstrates that need for approval moderates the association between extraversion and anxiety such that extraversion is negatively related to anxiety, but this is less true among extraverts higher in need for approval.



**Figure 2.**

This three-way interaction demonstrates that need for approval moderates the association between extraversion and anxiety such that extraversion is negatively related to anxiety, but this is less true among extraverts who are higher in the need for approval. This moderating effect is stronger among extraverts who spend more time on Facebook relative to those who spend less time on Facebook.

**Table 1**

Means, Standard Deviations, and Correlations among Variables

	1.	2.	3.	4.
1. Extraversion	--			
2. Need for Approval	-.08	--		
3. FB time	-.08	.04	--	
4. Anxiety	-.39 <sup>***</sup>	.22 <sup>***</sup>	.19 <sup>*</sup>	--
Mean	3.35	4.45	3.37	41.39
Standard Deviation	.77	1.35	1.46	10.77

Note. N= 280

\*\*  $p < .01$ .\*\*\*  
 $p < .001$ .\*  
 $p < .05$ .

**Table 2**

Hierarchical regression analysis predicting anxiety

Criterion		Predictor	B	SE B	t value	$\beta$
Anxiety	Step 1	Extraversion	-5.07	.75	-6.82	-.36***
		Approval	1.44	.43	3.15	.18**
		FB time	1.11	.40	1.64	.15**
	Step 2	Extraversion * Approval	1.32	.49	2.53	.14**
		Extraversion * FB time	-.65	.52	-.61	-.07
		Approval * FB time	.13	.31	-.35	.02
	Step 3	Extraversion * Approval * FB time	.90	.39	2.03	.13*

Note.  $N=280$ \*\*\*  
 $p < .001$ .\*\*  
 $p < .01$ .\*  
 $p < .05$ .