



January 2014

# Depression, Negative Self-Disclosure, And The Response Of Others On Facebook

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DEPRESSION, NEGATIVE SELF-DISCLOSURE, AND THE RESPONSE OF  
OTHERS ON FACEBOOK

by

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A Dissertation  
Submitted to the Graduate Faculty

Of the

University of North Dakota

In partial fulfillment of the requirements

For the degree of

Doctor of Philosophy

Grand Forks, North Dakota

December


2014


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This dissertation, submitted by Daniel Landauer in partial fulfillment of the requirements for the Degree of Doctor of Philosophy from the University of North Dakota, has been read by the Faculty Advisory Committee under whom the work has been done and is hereby approved.

  
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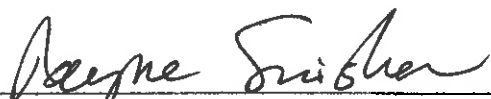
  
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Daniel Landauer  
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## ACKNOWLEDGMENTS

I would like to thank my Advisor, Dr. John Paul Legerski, for his patience, prodding, and encouragement during this process, Dr. Kyle DeYoung for his indispensable help with data analysis, my other committee members Dr. Alan King, Dr. Joelle Ruthig, and Dr. Timothy Pasch, for their incisive criticism and invaluable input, and my research assistants, Hannah Muhs and Avery Erickson, for helping me organize and code a daunting amount of data and sticking with me even after I left for internship. Finally, I would like to thank my wonderful friends, colleagues, and family whose unyielding love and support kept me going until the end.

## ABSTRACT

Depression has a number of deleterious effects on the interpersonal functioning of adolescents and emerging adults. The interpersonal theory of depression posits that depression is developed and maintained by both the behaviors of the individual and the responses of others to the individual. Adolescents and emerging adults are spending a significant amount of time interacting on social networking sites, such as Facebook, yet few studies have looked at the interpersonal behavior of depressed youth in the context of the interpersonal theory of depression. This study examined the interpersonal behavior of 328 emerging adult college students on Facebook using questionnaires related to depressive symptoms, self-esteem, interaction styles, and Facebook self-disclosure behaviors. A sub-sample of participants ( $N = 171$ ) provided access to their online profiles, allowing examination of their emotional self-disclosures via the Facebook status update function and the subsequent responses to those disclosures by their friends over a period of six months. Participants were categorized into depressed and non-depressed groups. Results indicate that participants in the depressed group expressed more negative emotion on Facebook and expressed negative emotions for different reasons than participants in the non-depressed group. Over time, positive and negative disclosures made by participants in the depressed group received significantly fewer responses from their Facebook friends, although the difference was small. These results provide mixed support for the interpersonal theory of depression in the context of social media

stressing the importance of continued research on the communication and disclosure behaviors of individuals with depression in this context.

# CHAPTER I

## INTRODUCTION

### **Emerging Adulthood, Depression, and the Interpersonal Context**

Depression is a devastating mental illness that is associated with a number of costs and consequences in a variety of domains, including cognitive functioning (Castaneda, Tuulio-Henriksson, Marttunen, Suvisaari, & Lönnqvist, 2008), academic/occupational functioning (Fergusson & Woodward, 2002), and interpersonal functioning (Daley & Hammen, 2002; Davila, 2008; Hammen, 2003; Johnson et al., 2002; Kuwabara, Van Voorhees, Gollan, & Alexander, 2007; Reinherz, Giaconia, Hauf, Wasserman, & Silverman, 1999). These costs and consequences of depression are particularly salient among individuals making the transition to adulthood.

Recently, researchers have posited that the transition to adulthood is a distinctive developmental period, separate from adolescence and young adulthood. Arnett (2000) has termed this period, from age 18 to roughly age 25, emerging adulthood. It has been argued that emerging adulthood is a critical period for many areas of development (Berry, 2004); a period that involves the development of self-concept, making important academic and career decisions, building independent living skills, and forming mature and stable intimate relationships (Kuwabara, et al., 2007). Experiencing depression during this stage can interfere with the acquisition of skills necessary to make a successful transition to adulthood, which then may lead to subsequent episodes of depression. Indeed, Rao, Hammen, and Daley (1999) found that individuals who

experience depression during early emerging adulthood are at higher risk for experiencing more chronic recurrent depression throughout their lives than those who experience depression later in life.

There is also evidence that individuals in late adolescence and early adulthood are more likely to experience significant depressive symptoms than the general population as a whole. It has been estimated that the lifetime prevalence of depression in youth aged 15-26 is between 23 and 25% (Kessler & Walters, 1998; Reinherz, Paradis, Giaconia, Stashwick, & Fitzmaurice, 2003), with between 10.62% and 13.8% of college students meeting criteria for a mood disorder (MDD, Dysthymia, or Bipolar Disorder) (Blanco et al., 2008; Eisenberg, Gollust, Golberstein, & Hefner, 2007). These numbers suggest that a rather substantial proportion of young people are experiencing significant depressive symptoms that likely affect their functioning in a number of different areas.

Numerous studies have indicated that depression has a number of deleterious effects on the interpersonal functioning of adolescents and emerging adults. Individuals with depression tend to exhibit a myriad of difficulties in familial, platonic/peer, and romantic relationships (Daley & Hammen, 2002; Kuwabara, et al., 2007; Reinherz, et al., 1999). They tend to have lower quality relationships than individuals without depression and tend to experience more conflict in their relationships (Davila, Stroud, & Starr, 2009; Hammen, 2003). They also experience more interpersonal rejection and are more likely to feel lonely (Segrin & Abramson, 1994).

### **Self-Disclosure and Depression**

Self-disclosure may be one way depressive symptoms shape interpersonal interactions. Though self-disclosure, particularly emotional self-disclosure, is an essential

component of building and maintaining intimacy in interpersonal relationships (Laurenceau, Barrett, & Pietromonaco, 1998), individuals with depression often express more negative affect and more negative self-disclosure in interactions with others than those who are not depressed. Individuals with depression frequently will discuss negative topics and express negative well-being and dysphoric feelings, even to strangers (Jacobson & Anderson, 1982; Segrin & Abramson, 1994). In a cooperative problem-solving task utilizing “stranger” confederates, Blumberg and Hokanson (1983) found that depressed women displayed a greater amount of negative content in their conversations, emitted more negative self-statements, expressed more self-devaluation, sadness, and helplessness than their non-depressed counterparts. In addition, Gibbons (1987) found that individuals with depression disclosed more intimate details and more negative affect when asked to write about a negative event than did individuals without depression.

Individuals with depression have been found to be more inclined to self-disclose following remarks that did not directly solicit self-disclosures (Jacobson & Anderson, 1982) and to evaluate negative topics as more appropriate to talk about than individuals without depression (Kuiper & McCabe, 1985). The results from these studies suggest that individuals with depression may feel more comfortable with making disclosures others find inappropriate and that they may be less responsive to or aware of social cues of others during interactions.

A number of factors may cause individuals who are depressed to engage in more negative self-disclosure than individuals who are not depressed. One plausible explanation is that individuals with depression experience more negative life events and stressors than individuals without depression, and these stressors are reflected in their

disclosures. Stressful life events have been positively correlated with depressive symptoms (Briere & Scott, 2013). Research with adults and children has also shown that individuals share more negative emotions when talking about negative events than when talking about more neutral or positive events (Baker-Ward, Eaton, & Banks, 2005; Bauer et al., 2005; Fivush, Hazzard, McDermott Sales, Sarfati, & Brown, 2003). A second factor might be that individuals experiencing depression have a greater tendency to focus on negative aspects of their lives. From the perspective of the cognitive theory of depression (Beck, Rush, Shaw, & Emery, 1979) the increase in negative disclosures may be the product of cognitive distortions which bias the individual to attend to mood-congruent stimuli and ignore mood-incongruent stimuli. A third factor may be that individuals with depression might self-disclose as a means to seek attention and reassurance from others. In their review of the emotional expression literature, Kennedy-Moore and Watson (2001) concluded that one major purpose of expressing negative emotions is to elicit social support from close others. Thompson (1994) also argued that expression of negative emotions is an emotion regulation strategy that signals the need for external support. Therefore, it is likely that depressed people are trying to elicit support and reassurance by communicating their distress.

Self-disclosing individuals with depression may, however, sometimes find themselves unsuccessful in garnering the social support and reassurance they seek. Gurtman (1987) found that depressive self-disclosure was associated with rejection, devaluation, and perceived maladjustment. He also found that verbal disclosure had a greater impact on the negative ratings than expressed affect (e.g. non-verbal behaviors such as facial expressions, tone of voice, posture, etc.). He reasoned that people are

generally viewed to be more in control of verbal vs. nonverbal behavior, so they are more responsible for their verbal disclosures. Interaction partners might find the disclosures off-putting and blame the depressed individual (who they see as in control of their disclosures), resulting in avoidance or rejection.

Segrin and Abramson (1994) suggest that the frequent discussion of negative well-being, negative or dysphoric feelings, and frequent demands for help may be an imposition on others who are made to feel obligated to offer assistance to the individual. These response demands may make others feel uncomfortable and result in avoiding or withdrawing from the depressed individual. They may feel uncomfortable because they do not know how to respond effectively or feel as if they must reciprocate the disclosure. In addition to being made to feel uncomfortable, the depressive behaviors often deviate from people's expectations for pleasantness in an interaction. In other words, they find the behavior aversive and are not receiving pleasurable reinforcement during their interactions with individuals with depression.

### **The Interpersonal Theory of Depression**

Coyne (1976) developed the interpersonal theory of depression to explain the interpersonal interactions of individuals with depression. He posits that depression is developed and maintained by both the behaviors of the individual and the responses of others to the individual. Coyne and others have theorized that individuals with depression have doubts about their self-worth and, thus, attempt to elicit reassurance from others that they are worthy (Hames, Hagan, & Joiner, 2013). However, their self-doubt leads the depressed individual to be wary of the genuineness of others' responses, so they are not satisfied with the reassurance they receive, ultimately causing them to seek



reassurance more and more frequently. This excessive reassurance seeking (ERS) eventually becomes aversive to friends, family members, and others, thus leading to diminished responses from others or outright rejection. This perceived or actual rejection then confirms that they are unlikeable and unworthy. ERS has been defined as a “relatively stable tendency to excessively and persistently seek assurances from others that one is lovable and worthy, regardless of whether such assurance has already been provided” (Joiner, Metalsky, Katz, & Beach, 1999, p. 270). Joiner, Alfano, and Metalsky (1993) argue that, in line with self-verification theory (Swann, Stein-Seroussi, & Giesler, 1992), individuals with depression continue to seek out reassurance because the positive feedback they receive is incongruent with their views about themselves. In other words, individuals with depression dismiss positive feedback and attune more to negative feedback. The negative feedback they receive confirms their view of themselves, which makes them feel even worse, causing them to seek reassurance, and leading to subsequent rejection. This process creates a downward spiral that serves to both maintain and exacerbate depressive symptoms and often leads to degradation in quality of social support.

Since Coyne’s formulation of the interpersonal theory of depression it has received significant research attention. An early meta-analysis of the extant literature by Segrin and Dillard (1992) found that consistent with the theory, increases in depressive symptoms are significantly correlated with increases in rejection. Additionally, individuals with depression induce more negative mood in interaction partners than do individuals without depression. A central component of Coyne’s theory is that ERS leads to negative mood induction in others (e.g. friends, peers, loved ones), who ultimately

reject the depressed individual seeking reassurance in order to avoid the negative mood they elicit. This mediation hypothesis has been somewhat refuted, however, as some evidence suggests that individuals with depression are rejected even when negative mood is not induced (Joiner, Alfano, & Metalsky, 1992).

A subsequent meta-analysis of 38 studies by Starr and Davila (2008) looking more specifically at research on ERS, depression, and rejection found that higher levels of ERS behavior were associated with higher levels of depression and rejection. It appeared, however, that the association was stronger for perceived rejection rather than actual rejection. This meta-analysis also found that the association between ERS and depression was stronger for depressed females than depressed males.

Several other studies have noted gender differences in ERS as well. Joiner and Metalsky (1995) found that while young women tend to engage in more ERS and negative feedback seeking than young men, only males who engage in these behaviors are more likely to be rejected. This suggests that ERS and negative feedback seeking may be viewed as more socially acceptable when exhibited by females. In contrast, however, other studies have demonstrated that ERS is predictive of later rejection for both female adolescents and college students (Joiner Jr, et al., 1993; Prinstein, Borelli, Cheah, Simon, & Aikins, 2005).

While the interpersonal theory of depression has received a plethora of empirical support (see Joiner Jr. & Timmons, 2009, for a review) there has been some debate about the comprehensiveness of the theory. There is continued investigation into other interpersonal variables that might moderate or mediate the relationship between interpersonal style, depression, and rejection. For instance, researchers have studied the

interpersonal problems of individuals with depression in the context of dysfunctional attachment cognitions and attitudes. Hazan and Shaver (1987) proposed that people's beliefs about relationships with romantic partners and friends are similar to the attachment styles found in children; childhood attachment experiences play a major role in the development of an inner working model of how to relate to others. Attachment researchers have since defined four attachment types in adolescence and adulthood: secure, dismissing, preoccupied, and fearful (Bartholomew & Horowitz, 1991).

Depression research has focused specifically on the preoccupied relational style as individuals with this attachment style are likely to have more difficulties in relationships and are likely to be more troubled by those difficulties. It has been posited that those with preoccupied styles of relating have an overwhelming need for closeness and intimacy, but fear rejection by others (Davila, Steinberg, Kachadourian, Cobb, & Fincham, 2004). Eberhart and Hammen (2006) determined that over a two-year period preoccupied attachment cognitions were one of the better predictors of subsequent depressive symptoms in young women. Furthermore, Carnelley, Pietromonaco, and Jaffe (1994) found that mildly depressed young women showed greater preoccupation and greater fearful avoidance than non-depressed young women.

Anxiously attached individuals may engage in ERS because they are wary of rejection. Shaver, Schachner, and Mikulincer (2005) proposed that ERS is an aspect of a preoccupied attachment style rather than a standalone construct. They found that ERS was associated with depression, but its effects were non-significant once preoccupied attachment style was accounted for. In addition, only the interaction between preoccupied attachment style and reassurance seeking was associated with negative mood. Those with

low ratings of preoccupied attachment, but high levels of reassurance seeking, actually reported a positive mood. This suggests that there is something about the anxiously attached individual's behavior that contributes to their negative mood. In contrast, Davila (2001) reported that ERS is a unique construct, separate but related to preoccupied attachment and dependency. She found that ERS was associated with depressive symptoms even after accounting for other interpersonal variables, though the contribution was modest (2% of variance), and that ERS was predictive of increases in depression (six months later) after accounting for attachment style.

Other researchers have further amended the interpersonal theory of depression by incorporating stress generation theory. Hammen (1991) found that depressed women experience more interpersonal stress than women with other psychological disorders or physical problems. She proposed that because of their symptoms, behaviors, and social context, depressed women actually play a significant part in generating their own stressful interpersonal conditions, which serves to maintain their depression. Potthoff and Joiner (1995) found that ERS's effects on future depressive symptoms were mediated by the experience of minor life stressors such that ERS was associated with an increase in life stressors and, in turn, experience of stressors was associated with future depressive symptoms. Joiner and Metalsky (2001) found that rejection caused high ERS individuals to become more distressed than low ERS individuals. The implication is that individuals who engage in ERS tend to generate their own stress and their experience with those stressors (e.g. rejection) leads to an increase in depressive symptoms. In addition, there is evidence that the interaction between high ERS and low levels of social support contribute to the development of depressive symptoms, while neither variable does so

alone (Haefffel, Voelz, & Joiner, 2007). Again, this suggests that the mechanism by which ERS affects depressive symptoms is through the stress the behavior cultivates.

In addition to attachment style and stress generation, there is some evidence that self-esteem mediates the association between ERS, depression, and rejection such that ERS and depression are associated with rejection only for individuals with low self-esteem (Joiner, et al., 1992). Importantly, this finding was more prominent for young males than females, consistent with results of the Joiner and Metalsky (1995) study discussed above. While the exact mechanism by which ERS behavior in individuals with depression leads to rejection is nebulous, it is clear that the behavior of individuals with depression often negatively affects how others respond to these individuals. One behavior that has been linked with rejection is negative self-disclosure, a form of social interaction that often accompanies ERS.

### **Excessive Reassurance Seeking and Negative Self-Disclosure**

It seems, then, that a common motivation for the ERS *and* negative self-disclosure behaviors of individuals with depression is to obtain support from others. Both behaviors can be used in attempts at eliciting sympathetic and supportive responses, and if taken to an extreme result in rejection. Therefore, ERS and negative self-disclosure may be related, if not intertwined, constructs. However, there is little to no research studying both constructs in tandem. The definition of ERS (discussed above) does not specify what constitutes specific reassurance seeking behaviors and ERS has often been operationalized as direct solicitation of reassurance (e.g. “Do you find yourself often asking the people you feel close to how they *truly* feel about you?”). ERS most likely

encapsulates a wide range of behaviors, including negative disclosure as some individuals may utilize negative self-disclosure to test others' responsiveness to their concerns..

To date, most of the research looking at the self-disclosure and reassurance seeking behaviors of individuals with depression and the reaction of others to those behaviors has been done via self-report questionnaire data or in a laboratory setting using experimental manipulation and other non-naturalistic research methods. In studies involving interactions, researchers have often utilized confederates or acquaintances (e.g. roommates) rather than those with closer ties to the depressed participant, though there are exceptions (cf. Cameron, Holmes, & Vorauer, 2009). Therefore, it is unclear if the depressed person's behaviors translate to real, genuine interactions. Furthermore, rejection is often measured hypothetically, asking interaction partners or raters how much they would like to interact with the participant in the future, rather than by actual rejection behaviors. These studies, while a valuable first step in understanding depression in the interpersonal context, have methodological limitations that are unable to address the potential generalizability of their findings. However, the rise of social networking sites (SNS) like Facebook as a major communication tool provides an opportunity for researchers to examine the interpersonal behaviors of depressed adolescents and emerging adults in a more naturalistic context.

### **Self-Disclosure and Facebook**

Facebook is the most popular social networking site with over a billion active monthly users (Facebook, 2014). Facebook has become a ubiquitous means of communication among adolescent and emerging adult populations. In a study conducted by Ellison, Steinfeld, and Lampe (2007) almost 95% of their undergraduate sample

reported using Facebook with 10-30 minutes of average daily use. Nadkarni and Hofmann (2012) propose that people use Facebook to satisfy two basic social needs: the need to belong and self-presentation. Facebook allows for the satisfaction of both of those needs by giving the user the ability to express themselves via the posting of personal information, hobbies, photos, and expression of thoughts and feelings that are shared or exchanged with people on their friends list. One of the most prominent vehicles for self-expression and self-disclosure on Facebook is the status update.

A status update (SU) is a brief usually undirected, public message (in contrast to a private, one-to-one message) where users can express their current thoughts and feelings. Studies have reported that, on average, college students post 1-2 status updates each week (Forest & Wood, 2012), and one study found that as many as 31% reported posting daily status updates (Köbler, Riedl, Vetter, Leimeister, & Krcmar, 2010). Manago, Taylor and Greenfield (2012) found that undergraduate students reported using status updates most frequently to express their current emotional state. These findings suggest that Facebook users may disclose emotional content on a relatively frequent basis. It is unclear if and how status update disclosures differ from more direct disclosures (e.g. through private messaging or face-to-face contact) and one major difference between status update disclosures and other forms of interpersonal disclosures is the size of the audience for the disclosure.

Status updates are disseminated through the News Feed (an aggregation of information posted by friends) of the user's friends to view and comment upon or "like". While users can control who sees their status updates, they are broadcast to the News Feeds of their entire friends list by default. Manago, Taylor, & Greenfield (2012)

reported a median friends list size of 370 people among a sample of undergraduate students. A breakdown of the types of people on the friends list revealed that 21% of them were considered to be close friends. The remaining people on the friends list were considered to be acquaintances (27%), activity-based (24%), or maintained connections (17%). This suggests that a large percentage of friends potentially viewing the personal disclosures of the user are those that the user does not know well. Despite the larger audience, undergraduate Facebook users believe that only a small number of their friends are actually looking at their status updates (10-50 friends). In addition, it appears as though Facebook users are just as likely to communicate with their close friends through public status updates as they are through other online interactions, such as making comments to the status updates of friends (Manago, et al., 2012).

It can be inferred, then, that when college students disclose personal or emotional information via a status update, their intended audience is a relatively small group of close friends. There is also evidence of continuity and consistency with regard to offline and online patterns of interaction, such that an individual's face-to-face patterns of interaction (e.g. positive and negative interactions) generally carry over to the types of interactions they have online (Mikami, Szewedo, Allen, Evans, & Hare, 2010). In summary, there is evidence that adolescents and emerging adults most frequently utilize status updates to make emotional self-disclosures, do so with the intention of reaching a fairly intimate audience (Manago, et al., 2012), and have similar offline and online patterns of interaction (Mikami, et al., 2010). Therefore, Facebook may be an appropriate medium through which the interpersonal behaviors of individuals with depressive symptoms can be investigated.



## **Depression and Negative Self-Disclosure on Facebook**

Only a few studies, as of now, have examined the content of self-disclosure via status updates, and how friends respond to that content. Even fewer studies have looked at Facebook disclosure in the context of mental health concerns. Moreno and her colleagues (Moreno et al., 2012; Moreno et al., 2011) have looked at the expression of depressive symptoms on Facebook. Using publically available Facebook profiles of 200 undergraduate students Moreno et al. (2011) coded one-year's worth of participants' status updates to assess the feasibility of using Facebook to screen for depression (independent of any other screening measure). While only 2.5% of the participants disclosed enough depressive symptoms to be considered "depressed", 25% of participants described one or more depressive symptoms over the course of the year. In a subsequent study, Moreno and colleagues (2012) found that 33% of participants made depressive references in their status updates. Those who reported depressive symptoms also tended to update their status more frequently than those without references to depressive symptoms.

Furthermore, for every response/comment to a depressive symptom status update, the user produced two more depressive status updates (Moreno, et al., 2011). These findings suggest that attention to their depressive disclosure encouraged users to further disclose depressive symptoms. This result would be expected in the context of the interpersonal theory of depression, which predicts that individuals with depression doubt the genuineness of the supportive responses of others and find supportive responses to be incongruent with their beliefs about themselves. This leads to utilization of negative

feedback seeking behavior (e.g. further depressive or negatively valenced disclosures) to confirm their beliefs about their self-worth.

Moreno and colleagues (2012) also reported that expression of depressive symptoms on Facebook was significantly correlated with higher scores on a depression screening instrument (PHQ-9). Of note, the researchers only coded status updates that clearly adhered to DSM-IV criteria for major depression, not including negatively valenced disclosures that did not directly mirror a symptom of depression.

In a series of studies, Forest and Wood (2012) examined self-disclosure behavior on Facebook in the context of self-esteem. As mentioned earlier, self-esteem has been found to mediate the relationship between ERS and rejection in individuals with depression, and has been associated with depression in general. Researchers examined the content of the participants' last 10 status updates and found that participants with low self-esteem expressed more negativity (e.g. sadness, anger, fear, anxiety, frustration, etc.) and less positivity than participants with high self-esteem. Low self-esteem individuals who expressed negativity were considered less likeable by undergraduate coders than high self-esteem individuals and low self-esteem individuals who did not make negative self-disclosures. In addition, low self-esteem individuals received more comments and "likes" on status updates with positive self-disclosures than on status updates with negative disclosures. In contrast, high self-esteem individuals received more responses from friends when making negative self-disclosures. These results suggest that if low self-esteem individuals make negative disclosures with the hope of receiving social support, they are likely not receiving it. The study's authors conclude that friends are more likely to respond to disclosures that differ from the usual behavior of the individual.

If the individual habitually expresses negativity, friends might not view the disclosures as specific requests for support (more a personality characteristic) or they might view these posts as tiresome and avoid responding in an attempt to discourage further negative disclosure.

While the research on the negative self-disclosure of individuals on Facebook is currently limited, the preceding studies suggest a) emerging adults express depressive symptomology via status updates on Facebook, b) negative self-disclosure by those with low self-esteem or habitual negative disclosure is seen as undesirable by friends and results in fewer responses, and c) responding to negative self-disclosure results in more frequent posts consisting of negative disclosures. Taken together, these sets of studies paint a fairly bleak picture of the benefits of negative self-disclosure on Facebook for depressed or low self-esteem individuals as the supportive responses they receive do not appear to alleviate depressive symptoms (rather they encourage expression of those symptoms) and continued negative disclosures result in less support overall.

### **Specific Aims**

The present study will use Facebook as a means to explore the self-disclosure behaviors of emerging adults with and without depressive symptoms and how others respond to those disclosures via an examination of their status updates. Using Facebook will allow for a more naturalistic method of investigating self-disclosure as the medium gives the researcher the ability to examine a record of behavior that has already occurred (i.e. past status updates) without the potential for behavior to be influenced by the researcher. In addition, Facebook provides a way to examine how others respond to the self-disclosures (rather than in a self-report/laboratory context by confederates or

acquaintances) by being able to track the number of comments and “likes” left on participants’ status updates.

The current study is designed to address some of the limitations of previous Facebook research. First, the study examined Facebook use over an extended period time (six months) rather than a selection of recent status updates (cf. Forest & Wood, 2012), which will provide for more confidence in observed Facebook disclosure patterns. It is possible that examining just the last 10 status updates is not representative of an individual’s general disclosure behavior. Second, the study obtained consent of participants to access their Facebook data rather than examining only publicly available Facebook profiles (Moreno, et al., 2011). This has the advantage of potentially capturing a larger and more representative sample that includes both public and private college-aged Facebook users.

The current study will use this medium to achieve two major aims. The first aim (A1) is to examine the little studied relationships between reassurance seeking, negative self-disclosure, and depression. There are two hypotheses related to this aim. The first hypothesis (H1) is that individuals with depressive symptoms higher in reassurance seeking will be more likely to make negative self-disclosure statements on Facebook than those who are lower in reassurance seeking. The second hypothesis (H2) is that the motivation for individuals with depressive symptoms to make negative self-disclosures on Facebook is to obtain reassurance and support. Support for these hypotheses could indicate that reassurance seeking and negative self-disclosure are related in that they serve similar purposes for the individual with depressive symptoms. This could have

implications for how the interpersonal theory of depression is conceptualized and researched in the context of social media and elsewhere.

The second aim (A2) of this study is to examine the responses of others to the self-disclosure behaviors of individuals with depressive symptoms. There are two hypotheses related to this aim. The first hypothesis (H3), based on the results of Forest and Wood (2012), is that individuals with depressive symptoms who make negative self-disclosures will be more likely to be rejected; their status updates will overall receive fewer comments and likes than the updates of individuals without depressive symptoms and they will receive fewer responses over time to their negative status updates. The second hypothesis (H4), based on the finding of Moreno et al. (2011), is that the receipt of support, in the form of comments and likes, to negative status updates will result in an increase in both amount and frequency of negative self-disclosure status updates.

Support for these hypotheses would suggest that the negative self-disclosures of individuals with depression are seen as aversive, that individuals with depression do not receive much social support from making negative disclosures, and that the support they do receive encourages them to make further negative disclosures, possibly because of negative feedback seeking tendencies. The two proposed goals of this study will be critical in understanding and evaluating the applicability of the interpersonal theory of depression to Facebook behavior, which could influence how depression is studied and inform development of interventions for depressed emerging adults.

## **CHAPTER II**

### **METHOD**

#### **Participants**

Participants were 328 undergraduate students recruited from psychology classes taught at a mid-sized university located in the Upper Midwestern region of the United States. Between the ages of 18 and 26 ( $M = 19.68$  years), 269 of the participants were female (82%) and 296 (90.2%) identified as being Caucasian or of Northern European descent. Seventy-four (22.6%) participants endorsed at least mild depressive symptoms ( $CES-D-R > 15$ ). Participants were eligible to participate in the current study if they were current college students between the ages of 18 and 26. Participants were selected to participate either based on their self-report ratings of depressive symptoms during a screening at the beginning of the semester or by volunteering to participate based on advertisements in the psychology department. To sign up for the study, participants used SONA Systems experiment management system (Sona Systems, 2012), a cloud-based participant management software that was available through the participants' university's psychology department. The SONA Systems interface provided instructions on how to initiate participation in the study. Participants received one hour of extra credit for their participation in the questionnaire portion of the study and were entered in a drawing to receive one of three \$25 gift cards. Participants received 1 hour of additional credit if they participated in the Facebook portion of the study.

#### **Materials**

*Motivation for Facebook Disclosure (MFD)*. This seven-item self-report instrument was developed by integrating two existing measures to assess what information participants generally disclose via the Facebook status update function and their typical motivations for making those disclosures (Manago, et al., 2012; Herting, Legerski, & Bunnell, unpublished measure). To address the question of what they disclose, a list of seven items was adapted from Manago, et al.'s (2012) measure of how people typically use their status updates which included: *sharing a negative emotional state, sharing a positive emotional state, sharing an opinion on a current event, venting frustration, using humor/satire, posting links/photos/videos, and keeping people updated on where they are/what they are doing*. For each of these items participants selected from a list of eight categories their motivation for providing this type of disclosure and rated each motivator on a 7-point scale from *not a reason at all* to *a major reason* for disclosing the information. The motivators for disclosure, adapted from the Most Impactful Memory Sharing measure (MIMS; Herting, Legerski, & Bunnell, unpublished measure), included *Validation, Intimacy, Problem-Solving, Meaning Seeking, Self-Exploration, Advice Giving, Comfort Others, and Entertainment* (an abbreviated version of the MFD is presented in Appendix A).

Given the aims of the current study, only the motivators for disclosure of *sharing a negative emotional state* and *sharing a positive emotional state* were examined. Of the motivators for Facebook disclosure, *Validation*, was of particular interest in the current study as it is the most similar to reassurance seeking. *Validation* was defined for participants as: *To legitimize your thoughts or feelings. To feel supported or reassured*. Given the absence of an established Facebook reassurance seeking measure at the time of

the study, *Validation* items served as a proxy for Facebook reassurance seeking in the analyses.

*Reassurance Seeking Scale (RSS; Joiner & Metalsky, 2001)*. A four-item self-report questionnaire derived from a more comprehensive measure of interpersonal style (Depressive Interpersonal Relationships Inventory) designed to assess degree of reassurance seeking behavior. It is the most widely used and accepted measure of reassurance seeking behavior. Items are rated on a 7-point scale with higher ratings corresponding to increasing amounts of a reassurance seeking interpersonal style. Scores are averaged across the items resulting in a reassurance seeking score between one and seven. Items include: *Do you frequently seek reassurance from the people you feel close to as to whether they really care about you?*; *Do you find yourself often asking the people you feel close to how they truly feel about you?*; *Do the people you feel close to sometimes become irritated with you for seeking reassurance from them about whether they really care about you?*; and *Do the people you feel close to sometimes get “fed up” with you for seeking reassurance from them about whether they really care about you?* The Reassurance Seeking Scale demonstrated good reliability in the current sample ( $\alpha = .87$ ), consistent with previous research (Joiner & Metalsky, 2001).

*Center for Epidemiologic Studies Depression Scale-Revised (CESD-R; Eaton, Muntaner, Smith, Tien, & Ybarra, 2004)*. The CESD-R is the revised version of the Center for Epidemiologic Studies Depression Scale, a 20-item self-report depression screening measure originally developed by Radloff (1977). The revised version of CESD has been modified to match DSM-IV criteria for a major depressive episode in order to improve content validity, but maintains the same number of items. Users are instructed to



rate how often they have experienced symptoms during the past week or so using a five-point scale (0 to 4) with higher scores corresponding to greater frequency of those symptoms over the past week. Scores can range from 0 - 80. A score of 16 or higher is reflective of a probable depressive “case” (Eaton, et al., 2004) and was the criteria used to distinguish participants in the depressed/non-depressed comparison groups. In the current sample, the scale demonstrated excellent reliability ( $\alpha = .94$ ) and was consistent with previous research on the CESD-R with a large community sample and college student sample (Van Dam & Earleywine, 2011).

*The Relationship Questionnaire (RQ; Bartholomew & Horowitz, 1991).* The RQ is a self-report measure designed to assess adult attachment style. This measure of attachment style was included to control for the effect attachment might have on the association between ERS and depressive symptoms. The measure consists of four paragraphs corresponding to four attachment styles (Secure, Dismissing, Preoccupied, and Fearful). Participants are asked to make ratings on a 7-point scale of the degree to which they resemble each of the four styles. The questionnaire yields a score for each of the four attachment styles with higher scores indicating greater identification with the relational style. The RQ has been found to have good construct and discriminate validity (Bäckström & Holmes, 2001; Bartholomew & Horowitz, 1991) as well as adequate convergent validity with interview ratings (Bartholomew & Horowitz, 1991).

*Distress Disclosure Index (DDI; Kahn & Hessling, 2001).* The DDI is a 12-item unidimensional self-report measure of the tendency to disclose negative emotions or mood states to others. This measure was utilized to determine the extent to which self-report disclosure tendencies correspond to actual disclosure behavior, though this

measure specifically focuses on openness to disclosing distress to others rather than general disclosiveness. Each item is rated on a five-point scale as to how much the participant agrees with the statement, from *strongly disagree* (1) to *strongly agree* (5). Scores for each item were summed to create a total DDI score, with possible total scores ranging from 12 - 60. Higher scores on the DDI reflect increased openness to disclosing distress. Consistent with previous research (Kahn & Hessling, 2001), the DDI demonstrated strong internal consistency ( $\alpha = .94$ ) in the current sample.

*Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1989)*. The RSE is one of the most widely used self-report instruments for measuring global self-esteem (Blascovich & Tomaka, 1991; Schmitt & Allik, 2005). Because self-esteem has been implicated as a mediator between ERS, depression, and rejection it was important to control for its effects in this study. The RSE is made up of 10 items rated on a 4-point scale from *strongly agree* to *strongly disagree* (with half of the items reverse-scored). Score on all items were summed to create a total RSE score, with possible total scores ranging from 10 – 40. Higher scores on the RSE reflect higher levels of self-esteem. In the current sample, the RSE demonstrated excellent reliability ( $\alpha = .90$ ) consistent with previous research with college-age individuals (Gray-Little, Williams, & Hancock, 1997).

In addition to the aforementioned established measures, participants were asked to report their number of Facebook friends, their mental health history, and their demographic information (i.e. age, gender, ethnicity, and years of education).

### **Procedure**

Study participants reviewed and signed an online informed consent form using Qualtrics (Qualtrics, 2012), a customizable online survey tool, detailing the purposes,

goals, and procedures of the study, as well as possible risks and benefits. The consent form included a clear description of what Facebook data was to be collected and measures that would be taken to ensure security and privacy with regard to that information. Participants then completed a series of self-report questionnaires on Qualtrics to collect information about the participants' Facebook use and behavior, Facebook disclosure behavior, current depressive symptoms, mental health history, reassurance seeking behavior, relational/attachment style, comfort with disclosing distress, and self-esteem.

After completing the questionnaires, participants were prompted to follow a URL link to the researcher's Facebook account/profile that had been created specifically for the study and were instructed to add the researcher as a Facebook friend to complete their active participation in the study. The Facebook profile created by the researcher was used solely for the research study and utilized strict privacy settings that restricted viewing of the profile's friends list and wall/timeline. This prevented participants from being able to see the friends list of the research profile or to post information to the timeline. Participants were informed that "friending" the research profile would allow the researcher to access their full Facebook profile. Collecting participants' actual data from Facebook is a relatively new method, but has been used successfully in the past (Moore & McElroy, 2012; Moreno, Grant, Kacvinsky, Moreno, & Fleming, 2012).

Among the participants, 321 (97.9%) endorsed having a current, active Facebook account. Two hundred twenty-three (69.4%) participants with active accounts consented to the Facebook portion of the study and added the researcher as a friend on Facebook. There were no significant differences between Facebook consenters and non-consenters

on any demographic variables (age, gender, ethnicity, or year in school). On variables of interest to the current study, Facebook consenters significantly differed from their counterparts on a measure of reassurance seeking ( $t(326) = -2.295, p = .022$ ), such that they reported lower levels of reassurance seeking.

### **Facebook Data Collection and Coding**

After confirming each participant's friend request, the researcher archived the participant's Facebook Timeline using QSR International's NCapture web browser plugin which enables the downloading and formatting of Facebook profiles for use with NVivo 10 (2012) qualitative analysis software. Once downloaded, the participant's Facebook Timeline was imported into NVivo 10. Next, the Facebook Timeline data was exported from NVivo 10 into a Microsoft Excel 2010 spreadsheet for coding purposes. Each participant's previous 6 months (from the date of participation) of status updates and associated information (timestamp, comments, and "likes") were extracted from the archived Timeline for data analysis. For the purposes of this study, a status update was operationalized as any post by the participant that included text by the participant (including shared links, videos, and photographs). Posts not including text (e.g. photographs or links without captions) were excluded from coding and analysis.

Facebook profiles were evaluated by one of three trained coders (the researcher and two undergraduate research assistants) using a codebook (Appendix B) adapted by the researcher from the Family Emotion Communication Scoring System developed by Shields, Lunkenheimer, and Reed-Twiss (2002). Each status update was coded as a positive disclosure, negative disclosure, or neutral disclosure (see Appendix C for coding examples). Given the text-based nature of status updates, type of disclosure was

determined by examination of keywords and phrases (such as those mentioned below), punctuation use (e.g. all capital letters, exclamation points, etc.), emoticon/emoji use (e.g. smiley/sad faces, hearts, etc.), as well as by examination of themes and content of the disclosure. Positive disclosures included expressions of happiness, excitement, gratitude, and good humor (e.g., “I am really excited to be staying in town this summer, taking classes and being a camp counselor! New opportunities. ☺”). Negative disclosures included expression of sadness, anger, frustration, anxiety, fear, irritability, fatigue, or embarrassment (e.g., “Heartsick and missing home more than ever.”). Neutral disclosures encompassed status updates in which the type of emotion expressed was unclear (e.g., possible sarcasm) or an emotion was not expressed, including statements of general information, solicitations, or inquiries (e.g., “Anybody want two tickets to tonight's hockey game?”). After coding each status update, the corresponding number of non-participant comments and number of “likes” were recorded.

The status update profiles of 20% of participants were double-coded by the researcher and/or research assistants to assess and maintain inter-rater reliability. In addition, 25% of the reliability profiles were triple-coded by all three coders. Overall inter-rater agreement was .83, using the percent agreement method, which indicates adequate reliability among all three coders. Thirteen profiles were selected at random for training purposes and were excluded from the reliability analysis as well as all subsequent analyses using Facebook data.

## **Data Analysis**

### **Pre-analysis Data Screening**

Participants were excluded from preliminary analyses if they did not meet the age requirement for the study ( $N=4$ ) or did not complete all self-report measures ( $N=1$ ). In addition, participants with fewer than three status updates during the sampling period ( $N=12$ ) and participants with either incomplete or missing Facebook data due to their security settings that appeared to prevent access to complete information ( $N=7$ ) were excluded from analyses involving Facebook data. In total, 171 participants were eligible for inclusion in the analyses utilizing Facebook data (status updates, comments, likes). A series of One-way ANOVAs were completed to evaluate potential significant differences between those included and not included in the analyses. Participants included in the analyses did not significantly differ on any demographics or self-report variables of interest.

All self-report measures were administered online via Qualtrics and data was imported directly into SPSS to minimize the potential for human error in data entry. In addition, Qualtrics warned participants about missing responses to items, which minimized the amount unintentional missing data. Within the dataset, missing data was minimal. Examination of the variables used in the current study revealed less than one percent of the data to be missing. Depending on the variable and the individual participant, missing data was estimated using either the sample mean for the variable or the participant mean (for repeated measures variables). Values were only imputed for data missing at the item-level. All Facebook data was entered by either the researcher or a research assistant and was checked by the researcher for accuracy.

The accuracy of the data was evaluated by looking at frequency distributions and other descriptive statistics. Valid outliers were examined using Cook's distance statistic

for each analysis. Though potentially influential data points were found, removal of these data points did not significantly alter the results of the analyses and, therefore, were included in the analyses. All continuous predictor variables were mean-centered to reduce multicollinearity prior to the analyses.

### **Analysis of Aim 1**

Within the first aim are two hypotheses: H1 and H2. In order to evaluate H1 a regression using the Generalized Linear Model (GLM) was conducted to examine the relationship among amount of negative self-disclosure (number of negative status updates) and level of depression (scores on CESDR), level of reassurance seeking (scores on the RSS), self-report of negative disclosure (scores on the DDI), and the interaction between depression and reassurance seeking. The DDI was included in the analysis in order to measure the congruence between self-report of negative disclosure and observed disclosure behavior.

The GLM was used because it allows for the non-normal distribution of the dependent variable and allows for the use of count data as the dependent variable (using a Poisson or negative binomial distribution). As expected, the dependent variable was significantly positively skewed. The observed variance of the dependent variable (number of negative status updates) exceeded the observed mean indicating overdispersion ( $M=10.78$ ,  $SD = 18.12$ ). Therefore, a negative binomial distribution was used in the analysis.

The relationship among depressive symptoms, excessive reassurance seeking, their interaction term and number of negative disclosure status updates was determined by examining the significance of the exponentiated regression coefficient ( $EXP(B)$ ) of

each variable. The  $EXP(B)$  statistic indicates that a one unit change in the independent variable leads to a proportionate change in the dependent variable. Each mean-centered predictor was entered into the model in a stepwise fashion to assess its impact on the model. Predictors that significantly impacted the model individually were included in the model along with the predictors deemed theoretically important to the hypothesis. Predictors that did not contribute to model significance or model fit were removed from the final model to achieve the best model fit.

In order to evaluate H2, two one-way repeated measures ANOVAs were conducted to examine the mean differences between depressed (CESDR >15) and non-depressed participants on the various reasons for disclosing negative emotional states and positive emotional states (*Validation, Intimacy, Problem-Solving, Meaning Seeking, Self-Exploration, Advice Giving, Comfort, and Entertainment*). Ratings on these reasons for disclosure were treated as eight within subject measurements. Subsequent pairwise comparisons using a Bonferroni adjustment were examined to ascertain the significant differences between the reasons for disclosing negative and positive emotional states.

### **Analysis of Aim 2**

Within the second aim are two hypotheses: H3 and H4. H3 and H4 were tested using the Generalized Linear Mixed Model (GLMM). GLMM was used because status updates and comments were nested within (i.e. a repeated measure) and unbalanced across participants (i.e. varied in number of status updates during the measurement period). Since the status updates varied in number and frequency over the six-month measurement period, time (in days) was used as an independent variable in all analyses



using the GLMM. In testing each hypothesis, the significance of the overall model was examined before looking at the specific effects.

In order to evaluate H3, a negative binomial regression using the GLMM was conducted to examine the relationship among the number of responses, depressive symptoms and the type of status update. For significant models, the *EXP(B)* statistic of the interaction between depression and type of status update was looked at to interpret the association among depressive symptoms, type of status update, and the number of responses in terms of an odds ratio.

In order to evaluate H4, a binary logistic regression using the GLMM was used to predict type of disclosure based on current depression status and responses to previous disclosures. The *EXP(B)* statistics of depression, responses to previous disclosures, previous negative disclosures, and time were examined to determine the extent to which receipt of responses to a negative status update led to further negative disclosures via the status update function. A hierarchical linear regression using the Linear Mixed Model (LMM) was conducted to determine the relationship among depression, responses to negative status updates and frequency of negative disclosures (operationalized as amount of time (in days) between negative status updates) over a six-month period.

## CHAPTER III

### RESULTS

#### Preliminary Data Analysis

Descriptive statistics are presented in Table 1. Responses per status update (the combination of comments and likes), ranged from 0 to 428 responses for negative status updates ( $N = 150$ ,  $M = 10.96$ ,  $SD = 12.72$ , Median = 9.00) and from 0 to 399 responses for positive status updates ( $N = 169$ ,  $M = 11.57$ ,  $SD = 7.87$ , Median = 9.88). A correlation matrix was developed to identify relationships among predictors and possible covariates (Table 2). Inclusion of a specific covariate in the subsequent analyses depended on both theory and observed correlation with the independent and dependent variables. Variables that exceeded a .8 correlation with other variables were removed from the regression equation. Most correlations were in the expected direction. However, depression and distress disclosure were negatively correlated, suggesting higher levels of depressive symptoms are associated with less comfort with disclosing distress. Nevertheless, higher depression scores were correlated with higher levels of reassurance seeking, disclosure of negative emotions for the purposes of validation, and more negative status updates. Depression was also highly correlated with self-esteem.

Besides depression, number of negative status updates was correlated with self-esteem, fearful attachment style, and disclosure of negative emotions to feel validated. Notably, number of negative status updates was not significantly correlated with

Table 1  
*Descriptive Statistics*

Variable	N	<i>M(SD)</i>	<i>Median</i>	<i>Range</i>
Depression	328	11.12 (11.31)	8.00	0 - 62
RSS	328	2.99 (1.42)	2.88	1 - 7
DDI	328	38.89 (9.20)	40.00	18 - 60
RSE	328	20.44 (5.24)	20.00	3 - 30
Age	328	19.68 (1.50)	19.00	18 - 26
Preoccupied	328	3.13 (1.59)	3.00	1 - 7
Fearful	328	3.58 (1.84)	4.00	1 - 7
FB Friends <sup>a</sup>	312	600.64 (355.07)	514.50	20 - 2286
Total Neg. SUs	171	10.78 (18.12)	5.00	0 - 171
Total Pos. SUs	171	26.39 (29.97)	17.00	0 - 169
Total SUs	171	45.99 (53.86)	27.00	3 - 419
Val.- Pos.	328	4.06 (1.89)	4.00	1 - 7
Val. - Neg.	328	3.05 (1.74)	3.00	1 - 7

*Notes.* Included participants did not significantly differ from non-included participants on any of the above variables. Median values are included to address skewness of some variables. RSS = Reassurance Seeking Scale; DDI = Distress Disclosure Scale; RSE = Rosenberg Self-Esteem Scale; Preoccupied and Fearful = Attachment Types; FB Friends = Number of Facebook Friends; Neg. SUs and Pos. SUs = Total Number of Negative and Positive Status Updates; Validation - Pos. and Validation - Neg. = Motivation for Disclosing Negative and Positive Emotions for Validation.

<sup>a</sup>16 participants declined to disclose their number of Facebook Friends or did not use Facebook

<sup>b</sup>number of participants eligible for inclusion in analyses using data from Facebook profiles

reassurance seeking, disclosure of positive emotions to feel validated, or distress disclosure. Neither the average number of responses to positive status updates nor the average number of responses to negative status updates was significantly correlated with any of the variables presented in Table 2.

With regard to gender, being female was positively correlated with a fearful relational style, number of positive status updates, number of overall status updates, but gender was not correlated with number of negative status updates or any other variables of interest to the current study. Therefore, gender was not included as a covariate in any of the subsequent analyses. Also noteworthy, were the moderate correlations between

Table 2

*Correlations*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 Depression	-													
2 RSS	.205**	-												
3 DDI	-.221	.001	-											
4 RSE	-.572**	-.330**	.308**	-										
5 Age	.075	.049	.074	-.003	-									
6 Gender	-.019	-.015	.083	-.115*	-.041	-								
7 Preoccupied	.197**	.308**	.022	-.275**	-.037	-.062	-							
8 Fearful	.264	.210**	-.245**	-.360**	-.025	.109**	.254**	-						
9 FB Friends	-.034	-.044	.092	.062	-.163**	.098	-.088	-.002	-					
10 Neg. SUs	.154*	.023	-.111	-.226**	.017	.085	-.030	.171*	.002	-				
11 Pos. SUs	.035	.013	-.055	-.096	-.019	.178*	-.072	.019	.030	.774**	-			
12 Total SUs	.093	.031	-.083	-.145*	-.014	.128*	-.048	.064	.036	.902**	.953**	-		
13 Val.- Pos.	.054	.162**	.142**	-.013	.042	.133**	.152**	.093	.063	.102	.107	.121	-	
14 Val. - Neg.	.161**	.222**	-.009	-.170**	.080	.079	.160**	.094	.028	.149*	.152*	.168*	.477**	-
N	328	328	328	328	328	328	328	328	312 <sup>a</sup>	171 <sup>b</sup>	171 <sup>b</sup>	171 <sup>b</sup>	328	328

*Notes.* RSS = Reassurance Seeking Scale; DDI = Distress Disclosure Scale; RSE = Rosenberg Self-Esteem Scale; Gender: Male = 1, Female = 2; Preoccupied and Fearful = Attachment Types; FB Friends = Number of Facebook Friends; Neg. SUs and Pos. SUs = Total Number of Negative and Positive Status Updates; Validation - Pos. and Validation - Neg. = Motivation for Disclosing Negative and Positive Emotions for Validation.

<sup>a</sup> 16 participants declined to disclose their number of Facebook Friends or did not use Facebook

<sup>b</sup> number of participants eligible for inclusion in analyses using data from Facebook profiles

\*\*  $p < 0.01$  level (1-tailed), \*  $p < 0.05$  level (1-tailed).

reassurance seeking and disclosure of both positive and negative emotions for the purpose of receiving validation. This correlation suggests that the MFD validation items may be acceptable proxies for reassurance seeking behavior on Facebook.

**Relationship among Depression, Reassurance Seeking, and Negative Self-Disclosure on Facebook (H1)**

Depressive symptoms, reassurance seeking, distress disclosure and the depression by reassurance seeking interaction term were included in the initial GLM analysis to assess their association with total number of negative status updates. The analysis of the model is represented in Table 3. The overall model proved to be significant,  $\chi^2(4) = 10.685, p = .03$ . Of the independent variables, only depression scores were significantly associated with of number of negative status updates,  $Exp(B) = 1.013, p < .01$ , indicating that higher depression scores were associated with a small, but significant increase in the overall number of negative status updates during the six-month measurement period.

Table 3  
*Relationship Among Depression, Reassurance Seeking, Distress Disclosure, and Number of Negative Status Updates*

Factor	B	SE	$\chi^2$	Exp(B)	95% CI	
Intercept	-1.574	0.0476	1092.962	0.207**	0.189	0.227
Depression	0.013	0.0043	9.272	1.013**	1.005	1.022
Reassurance Seeking	0.003	0.0310	0.011	1.003	0.944	1.066
Distress Disclosure	0.001	0.0046	0.064	1.001	0.992	1.010
Depression by Reassurance Seeking	-0.001	0.0023	0.085	0.999	0.995	1.004

\*\*p<.01

The relationships of reassurance seeking, self-report of distress disclosure, and the interaction between depression and reassurance seeking with number of negative status updates were not significant. Given their non-significant association with number of

negative status updates, reassurance seeking and distress disclosure were not included in subsequent models.

A second analysis was conducted with only depression and self-esteem included in model (Table 4) given self-esteem’s observed association with depressive symptoms and negative self-disclosure. The overall model proved to be significant,  $\chi^2(2) = 12.643, p = .002$ . When included in the model, self-esteem was significantly associated with number of negative status updates,  $Exp(B) = .978, p = .036$ , such that lower self-esteem scores were associated with making more negative status updates.

Table 4  
*Relationship Among Depression, Self-Esteem, and Number of Negative Status Updates*

Factor	<i>B</i>	<i>SE</i>	$\chi^2$	<i>Exp(B)</i>	95% CI	
Intercept	-1.582	0.0476	1103.582	0.206	0.187	0.226
Depression	0.006	0.0045	2.111	1.007	0.998	0.102
Self-Esteem	-0.022	0.0104	4.383*	0.978	0.959	0.999

\* $p < .05$

When self-esteem was entered into the model, the effect of depression became non-significant, suggesting that self-esteem may mediate the association between depression and negative self-disclosure on Facebook. Mediation effects were evaluated using the PROCESS macro in SPSS developed by Hayes (2013). Results of the mediation analysis yielded a bootstrapped 95% confidence interval of .0532 to .4028 for the effects of self-esteem. Since zero was not included in the confidence interval it can be inferred that the association between depression and negative status updates was fully mediated by self-esteem.

Both fearful attachment style and disclosure of negative emotions for validation were included in subsequent models. These variables were included based on observed

correlations with depression and negative self-disclosure. Neither variable was a significantly associated with of number of negative status updates, nor did they improve model fit beyond that of self-esteem.

### **Relationship between Depression and Reasons for Disclosing Negative and Positive Emotions on Facebook (H2)**

A repeated measures ANOVA with a Huynh-Feldt correction for non-sphericity for disclosure of a negative emotional state was conducted to determine the association between depression and reasons for disclosing negative emotions. The analysis revealed a significant main effect for reason for disclosure,  $F(5.80, 1849.91) = 21.83, p < .001$ , a significant main effect for depression,  $F(1, 326) = 15.10, p < .001$ , and a significant interaction between depression and reason for disclosure  $F(5.80, 1849.91) = 2.48, p = .024$ . Examination of the effects for reason for disclosure of negative emotions (Table 5) revealed that participants rated problem-solving, followed by comforting others, entertaining others, and validation as the biggest motivators for disclosing negative emotions of Facebook.

Examination of the estimated marginal means for depression, revealed significant differences between the depressed ( $M = 3.47, SE = .16$ ) and non-depressed groups ( $M = 2.78, SE = .08$ ) such that participants with depression reported significantly higher levels of motivation, in general, for disclosure of negative emotions on Facebook than their counterparts. Examination of the interaction between depression and reason for disclosure revealed that participants with depression were significantly more likely than their non-depressed counterparts to lend greater importance to validation, problem solving, meaning-seeking, self-explanation, advice-giving, comforting others, and entertaining others as reasons for disclosing negative emotions on Facebook (Figure 1).

Table 5  
*Mean Differences for Reasons for Disclosing Negative Emotional States on Facebook*

Reason	Not Depressed <i>M(SD)</i>	Depressed <i>M(SD)</i>	Total <i>M(SD)</i>
Validation	2.83 (1.75)	3.28 (1.70)*	2.94 (1.74)
Intimacy	2.34 (1.61)	2.65 (1.60)	2.41(1.61)
Problem Solving	3.23 (1.84)	3.81 (1.74)*	3.36 (1.83)
Meaning Seeking	2.36 (1.57)	3.01(1.82)**	2.51(1.65)
Self-Explanation	2.68 (1.70)	3.50(1.75)**	2.87 (1.75)
Advice Giving	3.00 (1.74)	3.65(1.78)**	3.14 (1.77)
Comfort Others	3.07(1.79)	4.03(1.84)**	3.28(1.85)
Entertain Others	2.75 (1.91)	3.81 (2.14)**	2.99 (2.01)
<i>N</i>	254	74	328

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

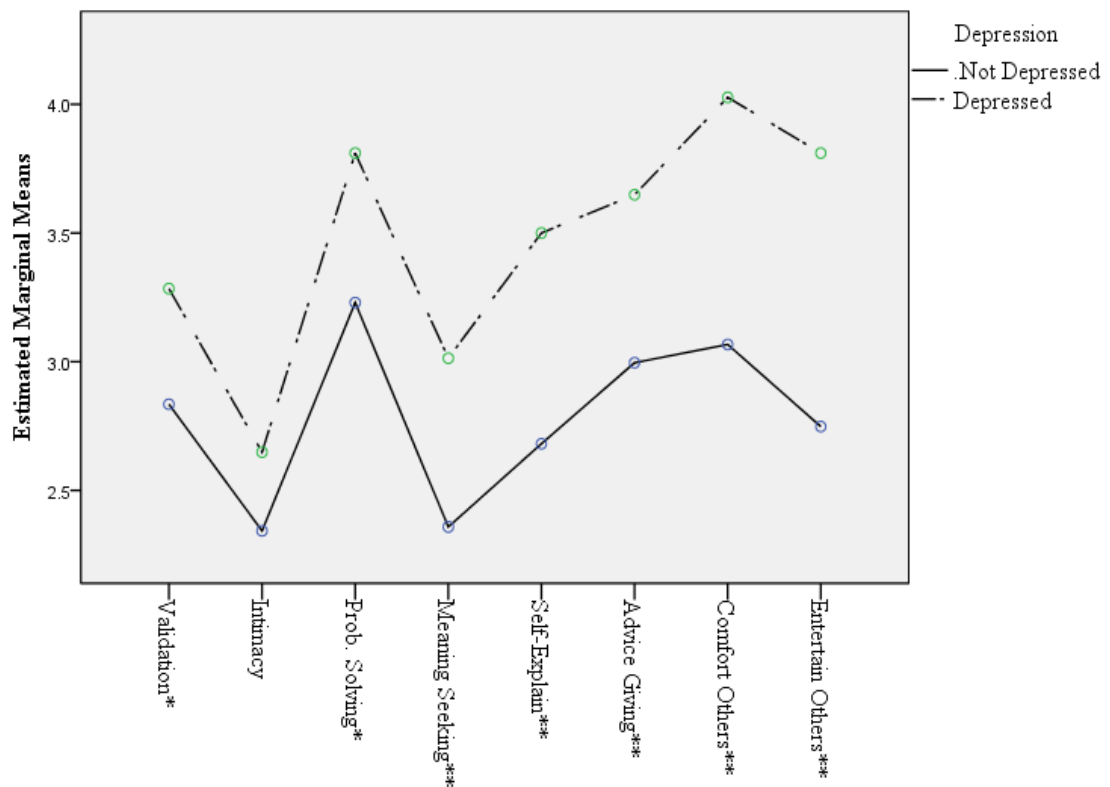


Figure 1. Reasons for Disclosing Negative Emotions on Facebook for Depressed and Non-Depressed Participants. \*\*  $p < 0.01$ , \*  $p < 0.05$ .

A repeated measures ANOVA with a Huynh-Feldt correction for non-sphericity for disclosure of a positive emotional state was conducted to determine the effect of



depression on reasons for disclosing positive emotions (Table 6). The analysis revealed a significant main effect for reason for disclosure,  $F(5.80, 1849.91) = 21.83, p < .001$ . Notably, the main effect for depression,  $F(1, 325) = 1.356, p = .25$ , and the interaction between depression and reason for disclosure,  $F(6.01, 1953) = 1.92, p = .075$ , were non-significant (Figure 2) indicating that individuals with and without depression disclose positive emotions on Facebook for similar reasons.

Table 6  
*Mean Differences for Reasons for Disclosing Positive Emotional States on Facebook*

Reason	Not Depressed <i>M(SD)</i>	Depressed <i>M(SD)</i>	Total <i>M(SD)</i>
Validation	4.10(1.88)	3.93(1.95)	4.06(1.89)
Intimacy	3.64(1.87)	3.89(1.75)	3.69(1.84)
Problem Solving	3.53(1.89)	3.64(1.84)	3.55(1.87)
Meaning Seeking	3.32(1.89)	3.50(1.75)	3.36(1.87)
Self-Explanation	4.03(1.85)	4.08(1.83)	4.04(1.84)
Advice Giving	3.98(1.95)	4.35(1.89)	4.06(1.94)
Comfort Others	4.27(1.89)	4.72(1.83)	4.37(1.89)
Entertain Others	4.54(1.92)	5.09(1.89)	4.67(1.93)
<i>N</i>	254	74	328

All  $ps > .05$

### **Depression, Negative Self-Disclosure and the Response of Others on Facebook (H3)**

The relationship between depression status, negative-self disclosure and the responses of others was tested using a GLMM with a negative binomial distribution. Depression status (depressed, not-depressed), type of status update (positive, negative, neutral), time (in days), time<sup>2</sup> (to account for quadratic variation over time), and the interactions between depression status and type of status update, and depression, type of status update, and time were entered as fixed effects. For the purposes of this analysis, only the intercept was included for random effects. The dependent variable, number of

responses, was a composite variable created by summing the number of comments and number of likes for each status update.

Examination of the fixed coefficients (Table 7) revealed that neutral status updates, but not negative status updates, were significantly associated with fewer

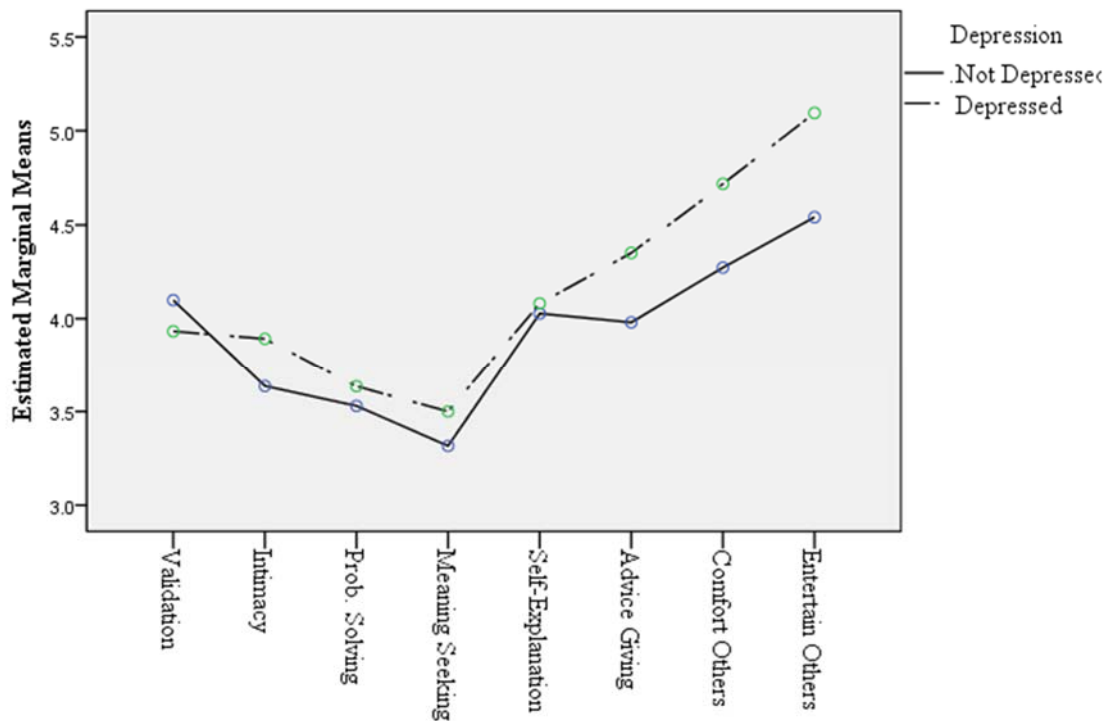


Figure 2. Reasons for Disclosing Positive Emotions on Facebook for Depressed and Non-Depressed Participants. All  $p$ s > .05.

responses from Facebook friends when compared to responses to positive status updates.

Neither depression nor the interaction between depression and negative status updates

were significantly associated with the responses of Facebook friends. Interestingly, there

was a small, but significant association between time and number of responses, such that

over time the number of responses to status updates increased. However, this effect did

not hold for depressed participants. Examination of the interactions between time and

depression revealed participants in the depressed group received fewer responses to status

updates as time passed compared to their non-depressed counterparts regardless of the

type of emotion expressed in the status update (negative or positive emotion). Though statistically significant, the effect was very small; individuals in the depressed group received 1.002 times fewer responses on their status updates per day than individuals in the non-depressed group. To put this into perspective, if this decline held constant over the course of a year, individuals in the depressed group would be expected to receive close to one fewer response to their status updates than the individuals in the non-depressed group.

Table 7  
*Relationship among Depression, Type of Status Update, Time, and Number of Responses to Status Updates*

Parameter	<i>B</i>	<i>SE</i>	<i>t</i>	<i>Exp(B)</i>	95% CI	
Intercept	2.182	0.058	37.550**	8.866	7.991	9.936
Neutral SU <sup>a</sup>	-0.386	0.090	-4.281**	0.680	0.570	0.811
Negative SU <sup>a</sup>	-0.020	0.067	-0.299	0.980	0.859	1.118
Depressed <sup>b</sup>	0.000	0.153	0.000	1.000	0.741	1.349
Time	0.002	0.001	2.542*	1.002	1.001	1.004
Time <sup>2</sup>	-0.000	0.000	-1.402	1.000	1.000	1.000
Depressed by Neutral SU <sup>ab</sup>	-0.274	0.279	-0.982	0.761	0.440	1.314
Depressed by Negative SU <sup>ab</sup>	-0.025	0.123	-0.200	0.976	0.767	1.241
Time by Neutral SU <sup>a</sup>	-0.001	0.001	-1.166	0.999	0.997	1.001
Time by Negative SU <sup>a</sup>	-0.001	0.001	-1.359	0.999	0.998	1.000
Time by Depressed <sup>b</sup>	-0.002	0.001	-2.137*	0.998	0.996	1.000
Time by Neutral by Depressed <sup>ab</sup>	-0.002	0.002	1.146	1.002	0.998	1.006
Time by Negative by Depressed <sup>ab</sup>	-0.000	0.001	-0.009	0.993	0.998	0.998

*Note.* All terms and interactions involving reference groups were omitted.

<sup>a</sup>Positive SU was designated as the reference group.

<sup>b</sup>Not Depressed was designated as the reference group.

<sup>ab</sup>Positive SU and Not Depressed was designated as the reference group.

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

#### **Depression, Responses to Negative Disclosure, and Future Negative Disclosures (H4)**

In order to evaluate H4, a hierarchical binary logistic regression was conducted to predict negative disclosures based on current depression status, previous negative disclosures, and responses to previous negative disclosures. The dependent variable, type of status update, was re-coded into a dichotomous variable (negative, not negative). Fixed effects entered into the model were depression status, time-lagged type of status update, time-lagged number of responses, the interaction between depression status and lagged status update, the interaction between depression status and lagged number of responses, time, and time<sup>2</sup>. Only the Intercept was included as a random effect in the model. Examination of the fixed coefficients (Table 8) revealed that both current depression status,  $Exp(B) = 1.732, p < .001$ , and previous negative status updates,  $Exp(B) = 1.329, p < .001$ , was associated with posting a negative status update. Number of responses to previous negative status updates, time, time<sup>2</sup> and the interactions between previous negative status updates and depression and between previous number of responses and depression were not associated with subsequent negative status updates.

Table 8  
*Relationship among Depression, Negative Status Updates, Responses, and Future Negative Status Updates*

Factor	<i>B</i>	<i>SE</i>	<i>t</i>	<i>Exp(B)</i>	95% CI	
Intercept	-1.539	0.143	-10.801**	0.215	0.162	0.284
Depressed	0.549	0.160	3.429**	1.732	1.265	2.371
Lagged Negative SU	0.285	0.061	4.676**	1.329	1.180	1.498
Lagged Responses	-0.006	0.004	0.158	0.994	0.987	1.002
Time	-0.002	0.002	-0.936	0.998	0.994	1.002
Time <sup>2</sup>	0.000	0.000	0.574	1.000	1.000	1.000
Lag SU by Depression	-0.006	0.052	-0.124	0.994	0.898	1.099
Lag Responses by Depression	0.003	0.004	0.654	1.003	0.994	1.011

\*\* $p < .01$

A hierarchical linear mixed model (LMM) was conducted to determine the relationships among depression, responses to previous negative status updates, and the

frequency of negative disclosures (the amount of time between negative status updates) over a six-month period. Examination of the fixed coefficients (Table 9) revealed a significant effect for depression, such that higher depression scores were associated with a decreased amount of time between postings of negative status updates (increased frequency). In addition, the effects of time and time<sup>2</sup> were also significantly associated with frequency of negative status updates suggesting that, initially, frequency of posting negative status updates decreased, but as time passed the frequency of negative status updates began to increase. Neither number of previous responses nor the interaction between depression and responses was significantly associated with frequency of negative status updates, though number of previous responses approached significance,  $B = .089$ ,  $t(1633.640) = 1.847$ ,  $p = .065$ .

Table 9  
*Relationship among Depression, Previous Responses, Time, and Frequency of Negative Status Updates*

Parameter	<i>B</i>	<i>SE</i>	<i>t</i>	95% CI	
Intercept	11.6583	1.674	6.963**	8.357	14.959
Depressed	-6.238	2.470	-2.526*	-11.142	-1.335
Lagged Response	.089	.048	1.847	-.005	.184
Time	.130	.022	5.777**	.086	.175
Time <sup>2</sup>	-.000	.000	-4.314**	-.000	-.000
Depressed by Lagged Response	-.061	.053	-1.146	-.165	.0435

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

## CHAPTER IV

### DISCUSSION

#### **Depression, Reassurance Seeking, and Negative Self-Disclosure on Facebook**

Results from the current study suggest that higher severity of depressive symptoms is associated with greater overall amounts of negative disclosures in using the Facebook status update. My results suggest, however, that the effect of depression may be indirect, such that the association between negative status updates and depression is mediated by self-esteem. Individuals with depressive symptoms tend to have lower self-esteem, and it may be low self-esteem that drives the depressed individual to make more negative disclosures on Facebook. This finding is consistent with previous research demonstrating that individuals with low self-esteem tended to express more negativity on Facebook than individuals with high self-esteem (Forest & Wood, 2012). In addition, this result is consistent with the well-established connection between depression and self-esteem in the research literature (Orth & Robins, 2013) and the robust correlation between the two variables observed in the current study.

Gender differences in depressive symptoms, reassurance seeking, and number of negative status updates were not observed. While the prevalence of depression is typically higher for females than males during adolescence and emerging adulthood (Kessler & Walters, 1998), there is some evidence that this is not always the case in college populations, especially for mild to moderate depressive symptoms (Eisenberg, et al., 2007; Kahn & Garrison, 2009). The non-significant relationship between gender and

reassurance seeking is notable, as it is inconsistent with previous research that has found females to engage in more reassurance seeking than males (Joiner and Metalsky, 1995; Weinstock & Whisman, 2007).

With regard to self-disclosure, there is some evidence that females tend to disclose more distress than males (Kahn & Kessler, 2001), but there is mixed evidence for this finding in the literature on disclosure on social networking sites. Moreno, et. al. (2011) found that females made more depressive references in their status updates than males. In contrast, other researchers (Thelwall, Wilkinson, and Uppal, 2009; Walton & Rice, 2013) have only found gender differences with regard to positive self-disclosure; females make more overall disclosures and more positive disclosures than males, but not negative disclosures. These findings are consistent with the current study as being female was associated with more overall status updates and more positive status updates than males, but not more negative status updates. Researchers have found gender differences in language use and content in online communication (Joiner et al., 2014; Walton & Rice, 2013) so it is possible that males and females differ in the types of negative disclosures they make.

The hypothesis (H1) that individuals with depression who are higher in reassurance seeking would be more likely to express negativity on Facebook than individuals with depression who are lower in reassurance seeking was not supported in the current study. Neither reassurance seeking nor the interaction between depression and reassurance seeking proved to be significantly associated with amount of negative disclosure on Facebook. There are several possible explanations for this non-significant relationship. First, there may be no association between self-report of reassurance seeking

behavior and actual behavior on Facebook. It is possible that the nature of Facebook communication affects the interaction style or behavior of individuals who are usually high in reassurance seeking, such that they engage reassurance seeking behavior less frequently than in one-on-one communication; reassurance seeking behavior may occur more frequently in more intimate interactions.

Second, reassurance seeking behavior on Facebook might look different than the traditional conceptualization of reassurance seeking as measured by the Reassurance Seeking Scale (RSS) in the current study. Indeed, Smith and colleagues recently developed the Facebook Reassurance Seeking Scale (Clerkin, Smith, & Hames, 2013; Smith, Hames, & Joiner Jr, 2013). Clerkin, Smith, and Hames (2013) defined Facebook reassurance seeking as, “the extent to which individuals utilize and place importance on their Facebook status updates to receive feedback from others” (pg. 526) as opposed to the RSS which measures direct solicitation of reassurance (e.g. *Do you frequently seek reassurance from the people you feel close to as to whether they really care about you?*). They found scores on the Facebook Reassurance Seeking Scale to be predictive of decreases in self-esteem even after controlling for offline reassurance seeking behavior (measured by the RSS), suggesting that Facebook reassurance seeking and offline reassurance seeking are related, but distinct constructs. Notably, the Clerkin, Smith, and Hames (2013) study did not compare their measure to observed Facebook behavior, leaving the question open of whether self-report of Facebook reassurance seeking is reflective of actual Facebook behavior.

Third, reassurance seeking behavior may only reflect a portion of negative self-disclosures on Facebook. There are likely qualitative differences between expressions of



negative emotion related to, for example, politics or world events and personal life circumstances, that are displayed independent of reassurance seeking and the current study did not differentiate between types of negative self-disclosures. Similarly, it is possible that not all negative disclosures are expression of stress or distress. As indicated by the results of the analysis for hypothesis two, individuals with depression endorsed several different reasons for disclosing negative emotions, only one of which (validation) is related to reassurance seeking.

Fourth, Facebook users may engage in reassurance seeking behavior in ways that do not necessarily involve negative disclosures, such as in asking “How do you guys think I did on my presentation today?” The modest correlation between reassurance seeking and disclosure of positive emotions for the purposes of validation in the current study suggests that positive disclosures could also be reassurance seeking behaviors. This may be a more adaptive or socially acceptable form of self-disclosure (i.e. does not violate expectations for pleasantness in interactions), which would explain why individuals in the depressed and non-depressed groups reported similar levels of motivation for disclosing positive emotions for validation.

Finally, individuals’ perceptions of their behavior may be discordant with their actual Facebook disclosures and could indicate a lack of insight into or awareness of their behavior. An important avenue for future research will be to explore the accuracy of self-reports with regard to their relationship to observed behavior.

### **Depression and Reasons for Emotional Self-Disclosure on Facebook**

The hypothesis (H2) that the intent of negative self-disclosure on Facebook for individuals with depression is to obtain reassurance and social support was partially

supported. Reassurance seeking was moderately correlated with the motivation for disclosure of negative emotions on Facebook for the purposes of validation. Validation was operationalized as having thoughts and feelings legitimized and feeling supported or reassured. Participants in the depressed group reported higher levels of motivation to disclose negative emotions for the purposes of validation than those in the non-depressed group. This suggests that individuals with depression do express negative emotions on Facebook with the intent of obtaining reassurance and support.

However, participants with depressive symptoms also reported higher levels of motivation for disclosing negative emotions for the purposes of problem solving, meaning seeking, self-explanation, giving advice, comforting others, and entertaining others than non-depressed participants. Validation ranked above only meaning seeking and intimacy in terms of reasons for disclosing negative emotions among depressed participants. As mentioned earlier, this suggests that reassurance seeking or solicitation of support likely comprises only a portion of negative disclosures made by individuals with depression on Facebook.

Of particular interest is the finding that participants with depressive symptoms reported higher levels of motivation for disclosing negative emotions on Facebook than participants without depressive symptoms for almost all of the reasons for disclosure, but did not do so for disclosure of positive emotions. If individuals with depression have more motives for disclosing negative emotions it stands to reason that they would seek more opportunities to express those emotions. This could explain, in part, the association between depression and increased negative self-disclosure on Facebook.

Additionally, this finding is consistent with previous research on the interpersonal behaviors of individuals with depression, which has found that individuals with depression tend to disclose negative emotions more frequently, to disclose negative emotions at inappropriate times, and to perceive negative topics as more appropriate to talk about than non-depressed individuals (Jacobson & Anderson, 1982; Kuiper & McCabe, 1985; Segrin & Abramson, 1994). Based on the results of this study it stands to reason if individuals with depression have more motivation to express negative emotions, particularly for the purposes of comforting others, entertaining others, and giving advice, then they may be more likely to make negative disclosures in instances in which individuals without depression would not. These disclosures may be viewed as less socially acceptable. This could have the effect of increased rejection or decreased engagement by Facebook friends. In fact, some evidence supports this, as participants with depressive symptoms received fewer overall responses over time (discussed in the following section).

In summary, reassurance seeking and disclosure of negative emotions do appear to be related at least in the context of motivation for disclosing negative emotions on Facebook, especially for individuals with depression. However, it is unclear if and how motivation to disclose negative emotions for the purposes of validation or reassurance seeking translates into actual Facebook behavior, as the reassurance seeking measures used in the current study were not associated with amount of negative status updates. It appears that reassurance seeking disclosure is only one of many types of negative self-disclosure in which individuals with depression engage.

### **Depression, Negative Self-Disclosure, and the Response of Others**

If individuals with depression are disclosing more negative emotions and doing so inappropriately in more contexts, then, per the interpersonal theory of depression, one would expect these individuals to experience negative interpersonal consequences in the form of rejection or fewer responses to their negative disclosures than their non-depressed counterparts. This hypothesis (H3) was partially supported in the current study. Depression, negative self-disclosure, and their interaction were not associated with the overall number of responses received; both participants with and without depressive symptoms received similar numbers of responses to both their positive and negative disclosures. While positive and negative status updates did not differ with regard to number of responses, neutral status updates (no expression of emotion) received significantly fewer responses than either of the status updates with emotional disclosures. This suggests that disclosures of emotion, regardless of valence, garner more attention than disclosures without emotional content.

The results of the study revealed a small, but significant increase in number of responses to status updates over the six-month measurement period, suggesting that in general Facebook users received more attention for their disclosures as time passed. It is unclear what is driving the increases in responses, as there is evidence that Facebook use is declining among adolescents and emerging adults (GlobalWebIndex, 2013a), so one might expect responses to status updates to decline as well. The interaction between time and depression was significantly associated with *decreases* in number of responses, but this decrease was very small. According to the model, if the decline held constant over the course of a year, individuals in the depressed group would be expected to receive approximately one fewer response to their status updates than the individuals in the non-

depressed group. With median frequency of responses for negative status updates and positive status updates being 9.00 and 9.88, respectively, it is unclear whether this decline may be meaningful, especially in the short-term. If this trend continues, in a few years many of the participants in the depression group could observe a more meaningful decrease in the number of responses to status updates. This subsequent degradation in attention and support may then become more tangible and potentially impactful. A possible explanation for this finding is that, if Facebook friends find repeated negative disclosures as aversive, they may become less attentive overall to the depressed individual and their disclosures, resulting in less attention and fewer responses to both negative *and* positive disclosures in the long-term.

Hypothesis four (H4) proposed that the receipt of support, in the form of comments and likes, to negative status updates would result in an increase in amount and frequency of negative status updates. This hypothesis was not supported as results suggest that responses to negative disclosures neither affect the likelihood that a depressed individual will make a subsequent negative disclosure nor affect the frequency of subsequent negative disclosures. These findings are inconsistent with Moreno et al.'s (2011) research which found that responses to depression references were associated with an increase in subsequent depression references. It should be noted, however, that Moreno et al.'s study looked specifically at status updates that contained depressive references and not negative disclosures in general. It is possible that responses to certain types of negative disclosures beget further disclosures of that type. This again, demonstrates the importance of differentiating the types of negative disclosures in future research on emotional expression via Facebook. Taken together, these findings suggest

that individuals' disclosure of negative emotions depends on mood and may represent a consistent pattern of behavior or interaction style that is insensitive to the responses of others.

### **Limitations and Future Directions**

Limitations in method and scope likely impacted the results of the current study as well as the generalizability of the results. Several limitations of the study have already been discussed in the text above, including non-congruence between self-report measures and observed behavior, which could indicate that the instruments used did not accurately measure the constructs of interest in the study. In addition, at the time of the present study no measure of reassurance seeking behavior on Facebook was available as Smith, Hames, and Joiner's (2013) Facebook reassurance seeking scale had not yet been published. The study relied on both a reassurance seeking measure (RSS) which was developed to assess offline interpersonal behaviors and a proxy measure of reassurance seeking behavior on Facebook developed for the study (Validation items on the MFD), the validity of which has not been tested. Therefore, it is possible that Facebook reassurance seeking behavior was not adequately captured by the measures used in this study. Evaluation of current instruments and development of more accurate instruments, combined with replication of the current study, will be crucial in order to increase confidence in the accuracy of the results of the current study.

The current study also did not account for type and intensity of negative disclosures. This study also did not examine the content of comments from Facebook friends or differentiate Facebook friends that provided responses (e.g. family, close friends, acquaintances, etc.). Rather than the number of responses, an individual's

disclosure behavior may be affected by the types of responses they receive from friends. Similarly, who responds to the disclosures might also be important. For example, it could be the case that even if some Facebook friends pay less attention to depressed individual's disclosures over time, certain Facebook friends (e.g. parents, best friends) may continue to provide the depressed individual with attention and support which could reinforce continued negative disclosure. In addition, some responses may be more or less impactful, depending on the relationship between the individual and the Facebook friend. Future research should look at disclosure behavior in the context of who is providing attention and support for negative disclosures.

The outcomes of the study may have been affected by the measurement period of the study. The current study examined only the most recent six months of participants' status updates. There is a possibility that more pronounced changes in disclosure behavior and responses to disclosure may occur over a longer period of time. Furthermore, participants likely had been using Facebook for several years prior to the onset of the study and it is possible that the patterns of emotion disclosure and the response patterns of Facebook friends may already be well-established and relatively stable for many of the participants in the depression group. It is possible the associations between self-disclosure and friend responses may more closely match the patterns of interactions hypothesized by the interpersonal theory of depression in the initial stages of Facebook use. Future research would do well to either examine an expanded period of Facebook use or to retroactively examine Facebook use in the months following initial setup of a Facebook account to clarify if and how the association among depression, negative self-disclosure, and responses changes over time.

Another limitation of the current study is the measurement of depression. The study looked at the previous six months of status updates, but depression was only measured at the end of the six-month period. Therefore, depressive symptoms during the measurement period were unknown which limits the interpretability of the findings. It is possible that Facebook disclosure behavior may change over time based on changes in mood or depressive symptoms. The current study looked at past Facebook use in order to limit the impact of researcher observation on participants' Facebook use. Nevertheless, it will be essential in future research to utilize a prospective design to better understand how changes in depression (as well as other variables) affect Facebook disclosure and responses to disclosure.

In addition, Facebook, and social networking sites in general, continually evolve with regard to features of the services, how users interact with the services and each other on those services, and the emphases the services place on types of content and communication. For example, as the popularity of sharing photographs and other media increased, Facebook has tweaked their interface to emphasize and promote sharing of photographs and other media (Sengupta, 2013). This change in emphasis could affect use of other parts of Facebook, such as the status update, as users adapt to the changes of the service. Additionally, Facebook recently admitted to manipulating users' News Feeds without their awareness as part of an experiment examining mood induction (Kramer, Guillory, & Hancock, 2014) such that some users were presented with either less positive or less negative content in their News Feeds. Changes in the algorithms Facebook uses to tailor content to users, like those used in the experiment, could affect what content users see and, in turn, could affect their usage patterns.



Therefore, these changes could have an impact on the implications of the current research and its future applicability to online communication via Facebook and other social networking sites. As mentioned earlier, there is evidence that Facebook use among youth is declining (GlobalWebIndex, 2013a), though it still remains, for now, the most popular social networking site for adolescents and emerging adults. The apparent reason for the decline is that youth are migrating to other social networking sites such as Twitter, Instagram, Vine, and Snapchat (GlobalWebIndex, 2013b). Each of these sites emphasizes different forms of communication such as status updates (Twitter), photographs (Instagram), videos (Vine), and direct communication via photographs (Snapchat), so it is likely that emotional self-disclosure is qualitatively different depending on the mode of communication. Future research may want to examine the impact of negative self-disclosure in the context of these other sites and applications or evaluate the variability in disclosure across social media formats.

Although a sizeable number of participants consented to access to their Facebook data, almost one-third of participants declined to participate in the Facebook portion of the study. Though Facebook non-consenters did not differ demographically from consenters, their reasons for not consenting are unknown. Participants may have declined to participate in the Facebook portion of the study for a number of reasons including (but not limited to) not having an active Facebook account, concerns about invasion of privacy associated with sharing their Facebook information, and/or not needing the additional extra credit offered for their participation. It is unclear if their participation would have affected the results of the current study. In future research utilizing Facebook

it would be informative to evaluate participants' reasons for declining access to their Facebook data.

Additionally, only current college students were included in this study and the participants were predominately Caucasian and female. It is possible that results might differ for emerging adults not attending college, ethnic minority groups, and males which limits the generalizability of the results from the current study. Future research in this area should attempt to increase diversity of the research sample to increase generalizability and applicability of the results.

Finally, the negative disclosure behavior of individuals with depression was only examined in the context of the interpersonal processes associated with the interpersonal theory of depression. It is possible that the Facebook disclosure behavior of individuals with depression is influenced or better explained by non-interpersonal factors associated with depression such as experience of negative life events and stressors (Briere & Scott, 2013) or a maladaptive cognitive style in which individuals tend to focus on the negative aspects of their lives and neglect positive aspects (Beck, et al., 1979). In their recent review of the interpersonal theory of depression, Hames, Hagan, and Joiner (2013) expressed a need for an integrative theory that combines components of both interpersonal and cognitive-behavioral theories of depression to comprehensively explain the onset, chronicity, and maintenance of depression. Therefore, future research in this area needs to examine both the interpersonal and non-interpersonal factors that may be affecting the social media disclosure and interaction patterns of individuals with depression.

## **Conclusion**

Despite the limitations discussed above, the current study did yield significant and compelling findings that contribute to the knowledge base about depression, negative self-disclosure and the responses of others on Facebook. First, depression is associated with more negative disclosure on Facebook via its link to self-esteem. Second, individuals with depression endorsed higher motivation for expressing negative emotions on Facebook for the purposes of reassurance and support than individuals without depression. However, individuals with depression also endorsed motivation for expressing negative emotions on Facebook for many other reasons which could account for the observed relationship between depression and making more negative status updates and the non-significant relationship between self-report of reassurance seeking and negative status updates.

Depression and type of disclosure did not affect amount of responses at any one time, but over time, participants with depressive symptoms received fewer responses for both their emotional disclosures regardless of valence, although the difference was small. Moreover, current depressive symptoms and previous negative disclosure each were associated with making negative disclosures and participants with depressive symptoms tended to make negative disclosures more frequently than participants without depressive symptoms regardless of the amount of responses that their disclosures received.

Taken together, these results highlight the importance of continued research on the communication and disclosure behaviors of individuals with depression on Facebook and other forms of social media. These findings are somewhat consistent with the interpersonal consequences of depression predicted by the interpersonal theory of depression (e.g. rejection) and provide some support for the applicability of the theory in

online contexts. Consistent with the theory, depression was associated with more overall negative disclosure, greater frequency of negative disclosure, small decreases in responses to emotional disclosures over time, and higher levels of motivation to express negative emotions for the purpose of validation on Facebook. Somewhat inconsistent with the theory, reassurance seeking was not associated with more negative self-disclosure and responses to negative disclosures were not associated with further negative disclosures. That the theory was not fully supported by the results of the current study suggests that while similar, there are likely qualitative differences between offline and online interpersonal behaviors. Given the results of the current study it will be crucial to further examine the applicability of the interpersonal theory of depression to online interactions.

In addition to research applications, these results could have important clinical implications as well. That individuals with depression may be experiencing some interpersonal consequences as a result of their disclosure behaviors on Facebook, suggests that it may be important to address these behaviors in clinical interventions for individuals with depression. If clinicians only focus on offline interpersonal interactions and behavior, interventions may not be as successful or lasting as they could be, as maladaptive interpersonal behavior may be maintained by online interpersonal behavior.

A primary focus of interpersonal psychotherapy (IPT) with depressed individuals is to identify and correct ineffective communication behaviors in order to improve quality of interpersonal relationships (Mufson, Dorta, Moreau, Weissman, 2004). Therefore, examination of an individual's Facebook behavior could be a useful intervention tool for clinicians to use with depressed or low self-esteem clients to evaluate and change

problematic interpersonal behaviors as it provides an objective look at patterns of interpersonal behavior, particularly self-disclosure behavior. For example, a client may bring a selection of Facebook interactions into the session, so that client and clinician could examine those interactions and develop interventions to improve effective communication. Future research should focus on developing and evaluating the efficacy of interventions utilizing Facebook feedback to improve the interpersonal effectiveness of depressed and low self-esteem individuals.

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## APPENDIX A

### Motivation for Facebook Disclosure

1. What are your reasons for sharing a **negative emotional state** (sadness, anger, frustration, anxiety, fear, irritability, fatigue, or embarrassment) on Facebook via a Status Update? Please rate each category on scale from 1 to 7 with a 1 meaning “not a reason” and 7 meaning “a major reason” for sharing this type of emotional disclosure.

<p><b>Validation</b> (To legitimize your thoughts or feelings. To feel supported or reassured.)</p>						
1	2	3	4	5	6	7
Not A Reason			Somewhat of a Reason			A Major Reason
<p><b>Intimacy</b> (To feel closer to others)</p>						
1	2	3	4	5	6	7
Not A Reason			Somewhat of a Reason			A Major Reason
<p><b>Problem-Solving</b> (To seek guidance and recommendations)</p>						
1	2	3	4	5	6	7
Not A Reason			Somewhat of a Reason			A Major Reason
<p><b>Meaning seeking</b> (For you to better understand yourself)</p>						
1	2	3	4	5	6	7
Not A Reason			Somewhat of a Reason			A Major Reason
<p><b>Self-explanation</b> (To help others understand you)</p>						
1	2	3	4	5	6	7
Not A Reason			Somewhat of a Reason			A Major Reason
<p><b>Advice giving</b> (To give guidance and recommendations to others)</p>						
1	2	3	4	5	6	7
Not A Reason			Somewhat of a Reason			A Major Reason

<b>Entertainment</b> (To entertain others)						
1	2	3	4	5	6	7
Not A Reason			Somewhat of a Reason			A Major Reason

2. What are your reasons for sharing a **positive emotional state** (of happiness, excitement, gratitude, and good humor) on Facebook via a Status Update? Please rate each category on scale from 1 to 7 with a 1 meaning “not a reason” and 7 meaning “a major reason” for sharing this type of emotional disclosure.

<b>Validation</b> (To legitimize your thoughts or feelings. To feel supported or reassured.)						
1	2	3	4	5	6	7
Not A Reason			Somewhat of a Reason			A Major Reason

<b>Intimacy</b> (To feel closer to others)						
1	2	3	4	5	6	7
Not A Reason			Somewhat of a Reason			A Major Reason

<b>Problem-Solving</b> (To seek guidance and recommendations)						
1	2	3	4	5	6	7
Not A Reason			Somewhat of a Reason			A Major Reason

<b>Meaning seeking</b> (For you to better understand yourself)						
1	2	3	4	5	6	7
Not A Reason			Somewhat of a Reason			A Major Reason

<b>Self-explanation</b> (To help others understand you)						
1	2	3	4	5	6	7
Not A Reason			Somewhat of a Reason			A Major Reason

<b>Advice giving</b> (To give guidance and recommendations to others)						
1 Not A Reason	2	3	4 Somewhat of a Reason	5	6	7 A Major Reason
<b>Comfort</b> (To support and comfort others)						
1 Not A Reason	2	3	4 Somewhat of a Reason	5	6	7 A Major Reason
<b>Entertainment</b> (To entertain others)						
1 Not A Reason	2	3	4 Somewhat of a Reason	5	6	7 A Major Reason

## APPENDIX B

### Coding Instruction Book

#### 1. What to Code

- a. Code all posts with text made by the participant in the 6 month timeframe. This includes:
  - i. Status Updates
  - ii. Photos with text/caption by the participant (ignore photos in which the participant is tagged, but did not post). For example photo with the text, “had a great time last night” should be coded.
  - iii. Links to websites or videos (or shared posts) with text by the participant. For example, a link to a video with the text, “this made my day!” should be coded.
- b. Do not code:
  - i. Direct messages/posts to Friend’s timelines (e.g. birthday wishes, etc.)
  - ii. Photos without accompanying text by the participant
  - iii. Links without accompanying text by the participant
  - iv. Shares without accompanying text by the participant
  - v. Any content related to Facebook Apps or games (e.g. Farmville updates or requests, etc.)
  - vi. Posts/messages to the participant by friends
  - vii. Any posts not made by the participant

#### 2. How to code:

- a. Adapted from the Family Emotion Communication Scoring System (Shields, Lunkenheimer, & Reed-Twiss, 2002)
- b. Three options
  - i. Positive expression of emotion (Positive post)
  - ii. Negative expression of emotion (Negative post)
  - iii. No expression of emotion (Neutral post)
- c. Positive Expression of Emotion
  - i. Positive themes and keywords
    1. **Happy:** Happy, joyful, thrilled, excited, emoticons with a smile/laughing
    2. **Affection/Gratitude:** Like, love, adore, emoticons with hearts, Thank you, etc.
    3. **Amusement/Humor:** Having/had fun, like (things or events), enjoy, laughing emoticons, LOL, ROFL, etc.
    4. **Positive self-emotion:** Proud, pleased (with myself), etc.

5. **Other Positive:** Surprised, relieved, feeling better, comfortable, etc., and related emoticons.
  6. **General positive terms, often used to describe quality of an event:** Good (as in, “ a good time” or “I felt good”), okay, a great time, better or easier or favorite (e.g. “a better time” or “favorite part”)
  7. **13. Quotations:** e.g. Song lyrics expressing positive/hopeful emotion
- d. Negative Expression of Emotion
- i. Negative Themes and keywords
    1. **Sadness:** Sad, depressed, blue, down in the dumps, emoticons with frowns or tears, etc.
    2. **Anger:** Mad, grumpy, cranky, irritable, frustrated, annoyed, pissed off, hate, and related emoticons
    3. **Fear/Anxiety:** Scared, afraid, frightened, anxious, stressed out, suspicious
    4. **Concern:** Worried, Concerned
    5. **Negative Self Emotions:** Guilty, ashamed, shy, bashful, embarrassed, mad at myself, timid
    6. **Sympathy:** Feel sad/bad for, feel sorry for someone
    7. **Regret:** To be sorry, feel bad about what I did
    8. **Jealousy:** Envious, Jealous
    9. **General Distress:** Disgusting, not like, upset, unhappy, bugging me, distressed, miserable, horrible, awful, disappointed, not funny, not happy, not having fun, bored, drives me crazy, lonely, confusing, missing somebody or something, hurt feelings
    10. **General negative terms, often used to describe the quality of an event:** A difficult time, a tough time, a hard time, a bad experience, not a great time, worse or worst.
    11. **Negative emotion behaviors:** Crying, arguing, pouting, and yelling (e.g. using all CAPS or emoticons).
    12. **Sarcasm:** e.g. “I just *love* these -20 degree days!”
    13. **Sleep:** References/complaints about lack of sleep, being tired, wanting to sleep more
    13. **Quotations:** e.g. Song lyrics expressing negative emotion
- e. No Expression of Emotion
- i. Neutral Themes and keywords
    1. **Expression of interest:** e.g. Linking to an “interesting” article (without other context).



2. **Pure Status Updates:** Where they are, where they will be (e.g. “shopping”, “in-class”, going home for the weekend, going out later), what they are eating, what they are doing (e.g. watching a movie/TV show)
  3. **Solicitations/questions:** (e.g. “selling my textbooks, furniture, etc.”, ‘Who’s up for a movie tonight?’ Where is the party tonight?’)
  4. **Ambiguous content:** Lyrics/quotes out of context
- f. Coding SUs with a combination of positive and negative emotions
- i. For Example, “RIP grandpa. I will miss you, but I will always remember the wonderful times we had!”
    1. General Rule: Code initial sentiment (I will miss you) only.
    2. Exception: second expression of emotion negates the first expression: e.g. “Sometimes I hate you, Billy. Jk...you’re an awesome brother!”

## APPENDIX C

### Coding Examples

#### Positive Status Updates

Kinda late news cause I found out last week but, IM GOING TO BE IN CONCERT CHOIR!!!

Great day out with my wonderful mom, complete with Chinese lunch and tea! #blessed

Such an amazing night with such amazing people! I literally have the greatest friends in the entire world! <3

I'd make an excellent vampire! I wouldn't even have to change my sleep schedule! :P

My dad is my hero. I am so proud of him <3 it is such a happy day!

I am really excited to be staying in town this summer, taking classes and being a camp counselor! New opportunities. :)

Did my math assignment, and a paper for psychology, feeling very accomplished tonight! :D

Nothing beats being at home, love it here <3

At my favorite place with my favorite guy!! <3

Happy Friday! :) Hope you have a great day and a fantastic weekend! :)

Finally figuring out what you want to do with the rest of your life is such a calming feeling!!!

#### Negative Status Updates

This road never looked so lonely...

It really stinks when you get up before its light out and are not done with class until its dark out again.

Well that's embarrassing...

They say it gets easier with time... I guess I'm still waiting for that. I wanted it all and I ended up with nothing.

Sometimes I just want to go back to sleep and pretend everything is different.

Uncomfortable when people aren't prepared and get mad at the workers...

It's sad when you have to make plans to make a phone call :((

This class is officially killing me. All I want to do is have a little fun.

That point in life when someone tells you you're a sucky friend...is never a good point in life...

I was always brave and kind of righteous now I find I'm wavering

Do you ever just see someone and you automatically want to punch them in the face? That's how I feel right now.

Bad drivers + last minute shoppers = my own personal hell.

Heartsick and missing home more than ever.

When it rains, it pours!! <:/

### **Neutral Status Updates**

Just inter library loaned my first thing... And it was a movie I wanted to make my friends watch.

Party in the basement. Everyone come!!

When you stop chasing the wrong things, you give the right things a chance to catch you.

So... who wants to play volleyball?

You were born to be real, not perfect.

I'm on duty tonight.

Thinking about rushing next semester... Sorority life?

I'm going to London for 1 month.

At the bar watching the game.

Anybody want two tickets to tonight's hockey game?