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Psychological Distress and Emotional Expression on Facebook

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Abstract

Social network sites (SNS) are a novel social environment for college students with psychological distress to connect with their peers, but the nature and effects of these interactions are not well understood. This study reports findings from a Facebook study among 238 college students reporting nonspecific psychological distress using the K-6 scale. Behavioral data included Facebook status updates containing affect words written by participants within the past 60 days and the number of responses (comments and likes) each update received. The updates were also coded for depression symptoms. Self-report data included participants' self-presentational concerns, the affective valence of each post, effects of responses on mood, and satisfaction with the responses to and outcome of each status update. Higher psychological distress was associated with displaying depression language on Facebook, with higher self-presentational concerns, and with less satisfaction with audiences' responses and less overall satisfaction with the outcome of the interaction. These results offer a unique glimpse into the social world of college students with psychological distress through their everyday use of Facebook, and how the interplay of this novel environment and students' mental health impacts their social behaviors and interaction meaning-making on Facebook.

Keywords: psychological distress, mental health, depression, Facebook, social network sites

Introduction

College students experience high rates of psychological distress,[1,2] a "state of poor mental health associated with symptoms from the anxiety–depressive spectrum."[3] Distress is often associated with depression and anxiety and linked to maladaptive behaviors and psychiatric disorders.[4] Such mental health vulnerabilities are affected by people's social environment; thus better understanding of mental health-relevant environmental risk and protective factors among college students is an identified need.[5]

In recent years, social network sites (SNS) have become increasingly important in students' lives,[6] leading to research on using SNS to understand mental health among young adults, including early identification, prevention, and intervention.[7] In particular, researchers have attempted to detect signs of depression through behavioral markers. For example, some students' Facebook profiles display depressive symptoms based on the DSM criteria for a major depressive episode, such as feeling hopeless or worthless[8–10] and there is a link between depression symptom displays and depression.[9,10] Language style is another behavioral marker of depression; tweets of people with depression use more negative affect words, more depression terms, more first-person pronouns, and fewer third-person pronouns than people without depression.[11] However, the relationship between SNS use and depression is complicated, with studies finding positive, negative, and no associations.[7] Work by Baker and Algorta suggests that rather than frequency or duration, the nature and quality of interactions on SNS may be more predictive of mental health. This may be because the quality of interactions encompasses not only what users do on SNS but also, more importantly, their psychological experiences and perceptions of the positivity or negativity of interactions.[7,12] Thus, to understand the impact of social networking on mental health and to leverage SNS as resources for prevention and intervention, it is crucial to understand the meanings individuals with depression, or psychological distress more generally, attach to interactions on SNS.

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Quality of interactions based on levels of psychological distress

Studies show that people with mental health issues report more negative and fewer positive interactions on SNS, as well as negative effects of social networking on subsequent mood states and quality of offline interactions.[13,14] With the exception of studies that coded for the display of depression symptoms,[8,10,15] most of these studies rely on self-report surveys and rarely examine actual interactions.[7] This leads to questions of whether the association between distress and negative interactions on SNS reflects a broader tendency of people with distress to perceive their interactions as lower quality[16] or whether posters with distress tend toward communication behaviors that invite low quality interactions.[17,18] Addressing this question requires analyzing online interactions.[14] To this end, we compare behavioral patterns and self-reported outcomes between students with differing levels of psychological distress by examining content shared with others, their feelings about their posts and others' responses to them, and overall satisfaction after posting and receiving others' replies. We focus on Facebook because it is the most popular and widely used social network platform among college students.[19,20]

This study tested several hypotheses. First, based on the findings about the display of depression symptoms,[9,10] we predicted that posts by people with psychological distress display more depressive symptoms (H1). Second, based on survey studies that found an association between depression and negative interactions,[13,14] we predicted that individuals with psychological distress would share more negative emotions (H2). Third, since previous research has identified a link between depression and Facebook activities that signal impression management concerns (e.g., profile updates, checking in, and adding friends the user never met),[21] we predicted that college students with psychological distress would show more self-presentational concerns (H3). Finally, building on findings about the link between depression and overall perception of SNS' interactions as being more negative,[13,14] we predict that college students with distress are less satisfied with outcomes of Facebook interactions (H4).

This study also examined several exploratory research questions. Since emotional disclosure, even without the expectation of responses, can bring comfort and serve to decrease symptoms of mild depression among students,[22] we hoped to better understand poster perceptions of Facebook communication. On Facebook, many benefits posters gain from emotional displays are by way of social rewards (i.e., ''likes'' and comments) they receive from their audiences that demonstrate attention and often validation.[23] To the extent that psychological distress may interplay with the number and interpretation of responses posters with distress receive, it may have downstream effects on their mood and outcome satisfaction. Therefore, we examine the relationship between distress and (a) the number of responses people receive (Q1), (b) their perceived satisfaction and usefulness of those responses (Q2), and (c) the relationship between audience responses and posters' mood (Q3).

Methods

Participants

Undergraduate and graduate students ($N=238$) were recruited between May 2013 and August 2014 from a northeastern United States university, as well as other universities using personal networks and social media advertisements. They were compensated with either a $5 Amazon.com gift certificate or extra credit. Participants had to have an active Facebook profile to participate in the study. The sample was 74.8 percent female ($N=178$) and 25.2 percent ($N=60$) male, ranging in age from 18 to 45 ($M=20.92$, $SD=3.31$). On average, participants had been Facebook users for 5.52 years ($SD=1.67$), spent 83.69 minutes ($SD=75.86$) a day on Facebook, and had 739 Facebook friends ($SD=475$).

Procedure

After consenting, participants logged on to Facebook and gave permission for a custom-made Facebook application to access status updates they had written within the last two months. To increase the chance of selecting content that included emotional sharing, updates that were three words or longer and contained at least one positive (e.g., happy, good, and joy) or negative (e.g., sad, hate, and worthless) affect word from the Linguistic Inquiry and Word Count 2007 dictionary[24] were kept. From this group, the most recent six status updates were displayed for each participant, along with questions described below about each update and any associated likes ($M=10.26$, $SD=13.24$) and comments ($M=1.76$, $SD=3.36$). For most participants (92 percent), their six updates were less than 30 days old; for infrequent posters, we collected fewer than six updates. Overall, data were collected for 842 status updates.

Measures

Participants completed the K-6 scale for nonspecific psychological distress, which captures clinical levels of depression and anxiety,[25] which contains six questions about the frequency of psychological distress over the prior 30 days with anchors of 1 = ''none of the time'' and 4 = ''most of the time,'' $\alpha=0.86$. Scores range from 6 to 24; the average was 12.06 ($SD=4.09$). More than 25 percent of participants had scores from 14 to 19, indicating medium levels of distress, with another 5.6 percent scoring over 19, a high level of distress.

Participants answered questions about the affective valence of expressed emotions in each status update using a seven-point semantic differential scale from 1 = ''very negative'' to 7 = ''very positive''.

Participants' self-presentation concerns for each status update were measured using four items adapted from previous work.[26] The measure included questions such as ''How concerned were you about what other(s) might think of you?,'' using a scale of 1 = ''not at all'' to 5 = ''very much so'' ($\alpha=0.95$).

Participants were asked several original scales to measure perceived interaction outcomes, which we have previously used on people with no psychological distress.[23] Two questions addressed satisfaction with responses, $\alpha=0.93$. An example item is ''To what extent were you satisfied with the responses to your post?'' Two others addressed the usefulness of responses, $\alpha=0.92$; an example item is ''To what extent did you find the responses to your post useful?'' One question asked how much the responses affected how they felt for the rest of the day. Participants' satisfaction with the outcome of each update was measured with two questions, $\alpha=0.85$; an

Table 1. Descriptive Statistics and Bivariate Correlations Between Main Status Update-Level Variables

	Range									
Variable	*Min*	*Max*	M	SD	*1*	*2*	*3*	*4*	*5*	*6*
1. Message valence	1.00	7.00	5.43	1.68	—					
2. Self-presentation concerns	1.00	7.00	2.92	1.29	0.23**	—				
3. Response satisfaction	1.00	5.00	3.65	1.11	0.33**	0.16**	—			
4. Response usefulness	1.00	5.00	2.68	1.23	0.15**	0.27**	0.53**	—		
5. How responses affect mood	1.00	5.00	2.84	1.34	0.14**	0.35**	0.44**	0.64**	—	
6. Outcome satisfaction	1.00	5.00	3.81	1.01	0.35**	0.14**	0.38**	0.38**	0.32**	—

*$p < 0.05$; **$p < 0.01$ (two tailed); ***$p < 0.001$ (two tailed).

example item is ''After sharing this message, to what extent do you feel satisfied with the outcome?'' All of these questions were measured on a five-point scale, from 1 = ''not at all'' to 5 = ''very much.''

All status updates were content analyzed for depression symptom references using a coding scheme derived from clinical criteria for symptoms of a major depressive episode (e.g., depressed mood, loss of interest in activities, and appetite changes).[27] Two independent coders classified whether messages contained a depressive symptom, with differences resolved through discussion (Krippendorff's $\alpha = 0.81$). Overall, 24 of 842 status updates (2.9 percent) contained depression symptom references, with 17 of 238 participants (7.1 percent) posting at least one such update.

Results

Since participants rated multiple messages, multilevel modeling was used to account for this nonindependence of data[28] using the Mixed Models procedure in IBM SPSS Statistics 21. All predictor variables were grand mean centered and all analyses controlled for age, sex, undergraduate versus graduate status, Facebook use, and time between messages; we report only significant variables below. Descriptive statistics and bivariate correlations for main update-level variables are presented in Table 1 and for main participant-level variables in Table 2.

Depression symptom displays

The first analysis sought to establish the link between distress and being a depression symptom displayer. Following prior work,[8] the probability of participants displaying depression symptoms in their status updates was modeled at the participant level. A negative binomial analysis showed a significant association between distress and being a depression symptom displayer, χ^2 (1) = 10.53, $p < 0.01$ ($OR = 1.20$, $SE = 0.06$). Participants with higher distress are more likely to be depression symptom displayers, even when controlling for self-presentation concerns and participants' sex.

After establishing the baseline connection between distress and being a depression symptom displayer, we turn to effects at the message level. We tested separately for the effect of distress and being a depression symptom displayer, as well as probing into potential interaction between the two.

Affective valence

There were no significant effects of distress on affective valence, $F(1, 146) = 1.67$, $p = 0.20$. However, there were significant effects of being a depression symptom displayer, $F(1, 139) = 4.26$, $p < 0.05$, and age, $F(1, 159) = 4.59$, $p < 0.05$, on valence, effect size $\eta^2 = 0.04$. Depression symptom displayers posted more negative status updates overall, as did older participants. There was no interaction effect between the level of distress and depression symptom display, $F(1, 146) = 2.23$, $p = 0.14$ (Table 3). Thus, although psychological distress was not directly associated with more negative status updates, on balance those who displayed depression symptoms had more negative posts, regardless of their level of psychological distress.

Self-presentational concerns

Higher K-6 scores were significantly associated with higher self-presentation concerns regarding status updates, $F(1, 230) = 8.68$, $p < 0.01$, $\eta^2 = 0.03$. However, being a depression symptom displayer was not associated with self-presentation concerns, $F(1, 178) = 0.67$, $p = 0.42$ (Table 3),

Table 2. Descriptive Statistics and Bivariate Correlations Between Main Participant-Level Variables

	Range								
Variable	*Min*	*Max*	M	SD	*1*	*2*	*3*	*4*	*5*
1. K-6 score	6.00	24.00	12.21	3.94	—				
2. Number of Facebook friends	9.00	2300.00	739.92	474.89	–0.14*	—			
3. Minutes per day on Facebook	5.00	420.00	83.69	75.87	0.05	0.10	—		
4. Years having a Facebook account	1.00	10.00	5.53	1.67	–0.03	0.32**	0.10	—	
5. Age	18.00	45.00	20.92	3.94	–0.04	–0.12	–0.09	0.19**	—

*$p < 0.05$; **$p < 0.01$ (two tailed).

Table 3. Models Predicting Message Characteristics

Dependent variable	*Predictor*	*B (SE)*	*95% CI*	p
Message valence	Intercept	5.80 (0.62)	(4.58, 7.02)	0.00
	K-6 score	–0.10 (0.07)	(–0.23, 0.03)	0.15
	Age	–0.05 (0.02)	(–0.10, 0.00)	0.03
	Depression symptom display			
	Nondisplayer	0.66 (0.32)	(0.03, 1.30)	0.04
	Displayer	0		
Self-presentation concerns	Intercept	2.72 (0.25)	(2.23, 3.22)	0.00
	K-6 score	0.06 (0.02)	(0.02, 0.10)	0.00
	Depression symptom display			
	Nondisplayer	0.22 (0.26)	(–0.31, 0.74)	0.42
	Displayer	0		
Likes	Intercept	8.94 (2.14)	(4.71, 13.17)	0.00
	K-6 score	0.03 (0.18)	(–0.33, 0.38)	0.88
	Message valence	1.58 (0.29)	(1.02, 2.14)	0.00
	Depression symptom display			
	Nondisplayer	1.84 (2.27)	(–2.64, 6.33)	0.42
	Displayer	0		
Comments	Intercept	1.92 (0.45)	(1.03, 2.81)	0.00
	K-6 score	0.05 (0.04)	(–0.03, 0.13)	0.20
	Message valence	–0.03 (0.08)	(–0.18, 0.12)	0.67
	Depression symptom display			
	Nondisplayer	–0.15 (0.48)	(–1.10, 0.79)	0.76
	Displayer	0		
Response satisfaction	Intercept	3.52 (0.16)	(3.19, 3.85)	0.00
	K-6 score	–0.03 (0.01)	(–0.05, 0.00)	0.04
	Message valence	0.15 (0.02)	(0.10, 0.19)	0.00
	Depression symptom display			
	Nondisplayer	–0.07 (0.17)	(–0.41, 0.27)	0.69
	Displayer	0		
	Comments	0.04 (0.01)	(0.02, 0.06)	0.00
	Likes	0.02 (0.00)	(0.01, 0.02)	0.00
Response usefulness	Intercept	2.92 (0.22)	(2.49, 3.36)	0.00
	K-6 score	0.01 (0.02)	(–0.02, 0.05)	0.44
	Message valence	0.05 (0.02)	(0.01, 0.10)	0.02
	Depression symptom display			
	Nondisplayer	–0.41 (0.23)	(–0.87, 0.04)	0.08
	Displayer	0		
	Comments	0.03 (0.01)	(0.01, 0.05)	0.01
	Likes	0.01 (0.00)	(0.00, 0.02)	0.00
How responses affect mood	Intercept	2.87 (0.23)	(2.43, 3.32)	0.00
	K-6 score	0.05 (0.02)	(0.01, 0.08)	0.01
	Message valence	0.04 (0.02)	(–0.00, 0.09)	0.07
	Depression symptom display			
	Nondisplayer	–0.44 (0.24)	(–0.91, 0.03)	0.06
	Displayer	0		
	Comments	0.02 (0.01)	(–0.00, 0.04)	0.07
	Likes	0.02 (0.00)	(0.02, 0.03)	0.00
Outcome satisfaction	Intercept	3.62 (0.10)	(3.41, 3.83)	0.00
	K-6 score	–0.03 (0.01)	(–0.05, –0.02)	0.00
	Message valence	0.06 (0.02)	(0.03, 0.09)	0.00
	Depression symptom display			
	Nondisplayer	0.03 (0.11)	(–0.19, 0.25)	0.80
	Displayer	0		
	Comments	0.01 (0.01)	(–0.01, 0.02)	0.36
	Likes	0.01 (0.03)	(0.00, 0.01)	0.00
	Response satisfaction	0.51 (0.03)	(0.45, 0.57)	0.00
	Response usefulness	0.06 (0.03)	(0.01, 0.11)	0.03

and there was no interaction between being a depression symptom displayer and psychological distress on self-presentational concerns, $F(1, 168) = 0.93$, $p = 0.34$. Thus, distress was associated with greater concerns about self-presentation in Facebook status updates.

Responses received

Psychological distress was not significantly associated with the number of likes, $F(1, 187) = 0.02$, $p = 0.88$, or comments, $F(1, 235) = 1.64$, $p = 0.20$, that participants received.

Being a depression symptom displayer also did not have a significant effect on the number of likes received, $F(1, 132) = 0.66$, $p = 0.42$, or comments, $F(1, 173) = 0.10$, $p = 0.76$. No significant interaction between distress and depression symptom display was found either, for either likes, $F(1, 123) = 2.21$, $p = 0.14$, or comments, $F(1, 160) = 0.00$, $p = 0.97$.

However, the affective valence did have a significant effect on the number of likes $F(1, 757) = 30.53$, $p < 0.001$, $\eta^2 = 0.03$, but not the number of comments, $F(1, 746) = 0.19$, $p = 0.67$, with more positive messages receiving more likes for all participants (Table 3). Taken together, there were no differences in the number of responses and likes based on one's psychological distress level or displaying depression symptoms on Facebook.

Response satisfaction and usefulness

Participants with higher levels of distress experienced less response satisfaction, $F(1, 234) = 4.10$, $p < 0.05$, $\eta^2 = 0.15$, even when controlling for affective valence and the number of comments and likes. However, distress did not have a significant effect on how participants rated responses' usefulness, $F(1, 227) = 0.60$, $p = 0.44$, and neither did being a depression symptom displayer, $F(1, 169) = 3.21$, $p = 0.08$.

Thus, regardless of the number of comments or likes received on Facebook, participants with higher distress experienced less satisfaction with audiences' responses to their status updates even though they considered those responses just as useful as did participants with lower distress.

How responses affect mood

Higher levels of distress were also significantly associated with the extent to which participants said responses affected their moods for the rest of the day, $F(1, 217) = 7.29$, $p < 0.01$, $\eta^2 = 0.10$; people with higher levels of distress were more affected by the responses they received. Again, the effect of being a depression symptom displayer was not significant, $F(1, 163) = 3.48$, $p = 0.06$ (Table 3).

There was a significant overall interaction effect between level of psychological distress and being a depression symptom displayer on mood, $F(1, 154) = 6.84$, $p < 0.05$. As levels of distress increased for depression symptom nondisplayers, how much responses affected their mood decreased, but with a slope that was not significantly different, $t(148) = 1.63$, $p = 0.11$. However, depression symptom displayers showed the opposite trend; as levels of distress increased, so did the extent to which responses affected their mood, $t(154) = 2.62$, $p < 0.01$. Thus, the more distressed participants were the more their mood was affected by those responses, with this effect being most pronounced for depression symptom displayers.

Satisfaction with the outcome

Finally, the effect of psychological distress on how satisfied participants were with the outcome of each status update was investigated, controlling for affective valence, responses (number of comments and likes), response satisfaction, and response usefulness. Whereas valence, number of likes, response satisfaction, and response usefulness all contributed positively to the satisfaction of the outcome on Facebook (Table 3), distress had a significant negative association with the satisfaction of the outcome even when controlling for all of the above factors, $F(1, 168) = 15.34$, $p < 0.001$, $\eta^2 = 0.41$. Finally, whether or not the participant was a depression symptom displayer, $F(1, 117) = 0.07$, $p = 0.80$, the interaction between distress and depression symptom display, $F(1, 107) = 0.09$, $p = 0.76$, was not associated with the satisfaction of the outcome (Table 3).

Discussion

This study contributes several findings toward understanding how people with psychological distress interact with and are affected by others on Facebook. In particular, we examined differences in objective characteristics of interaction (i.e., explicit references to depression and number of ''likes'' and responses received to status updates) and subjective perceptions of Facebook experiences between people with and without psychological distress to understand factors that contribute to less satisfying experiences in SNS for people with distress.

First, although explicit depression references are quite uncommon, there was an association between psychological distress and displaying depression symptoms. This extends previous findings about individuals with depression[9,10] to psychological distress as a broader phenomenon that measures clinical and subclinical levels of mood disorders (mostly depression and anxiety) and shows that these differences are noticeable even with a small number (six or fewer) of Facebook status updates instead of a whole year's worth.

Second, despite the association between being a depression symptom displayer and having psychological distress, distress was not correlated with self-reported negativity in status updates. Overall, status updates were generally positive regardless of psychological distress status, while individuals with and without distress posted roughly the same number of positive and negative posts. This lack of distress-based difference in affective valence is consistent with studies of face-to-face conversations with strangers, in which students with and without depression showed no difference in affective valence, presumably because of self-presentation concerns.[29] Although Facebook is largely used to interact with known friends and acquaintances, broadcasting to large and heterogeneous Facebook networks amplifies self-presentational concerns in publicly displayed status updates.[26] Indeed, our data show that students with distress are more concerned with how they present themselves to Facebook audiences compared to those without distress.

The picture emerging from these findings suggests that although people with distress worry about self-presentation and censor content in order not to appear overly negative (i.e., no difference in affective valence of status updates based on distress levels), they are sometimes willing to present themselves as vulnerable by displaying, although very infrequently, their depression state (based on the link between distress and being a depression symptom displayer). This highlights the tensions that people with distress experience on Facebook between trying to balance positive presentation and self-image in front of others with a negative self-view reflective of psychological distress.

These tensions may be one reason why people with distress experience less satisfaction with audiences' responses to their posts and are less satisfied with the outcome from

Facebook interactions, despite no difference in the number of likes and comments received by those with and without psychological distress. According to interpersonal theories of depression,[30–32] individuals with distress experience stress and interpersonal dissatisfaction because of conflicting desires for self-verification and self-enhancement whereby they simultaneously seek to verify their negative self-views and disconfirm them through reassuring feedback from others. It is possible that students with distress concerned with how they present themselves to their Facebook audiences might feel dissatisfied with their interactions because they cannot internalize positive feedback from others that is incongruent with their negative self-views, or because being in a state of psychological distress skews their interpretation of others' responses. Finally, individuals with distress reported having a stronger effect of responses on their mood for the rest of the day, possibly because of neurological sensitivity for processing emotional stimuli or depressive rumination following Facebook interactions.[13,14] Given the role of response satisfaction in overall outcome satisfaction, as well as lasting effects of responses on the mood of people with distress, it is important from both an applied and theoretical perspective to understand how SNS' audiences respond to their posts, as an integral part of their online social networking experience.

The study has several limitations that may affect generalizability of these findings. Although self-reported distress and behavioral data were temporally close, future studies might consider collecting communication and distress data in real time, as well as extending these findings to communication on other SNS. Future research might also consider incorporating other types of emotional content, such as emojis and shorter updates, which we have not considered, into the analysis of SNS' interactions. Finally, research should consider longitudinal methods to tease out causal relationships between social interactions on SNS and mental well-being. Despite these limitations, this article offers new insights into social interactions and meaning-making of students with distress through their everyday uses of Facebook.

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