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Negative Experiences on Facebook and Depressive Symptoms Among Young Adults



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A B S T R A C T

Purpose: To examine whether negative Facebook (FB) experiences were independently associated with depressive symptoms among young adults in a longitudinal family cohort.

Methods: Negative FB experiences were measured by type (e.g., bullying or meanness, unwanted contact, misunderstandings, or any), recency, number of experiences, and severity of upset. Depressive symptoms were assessed using the 10-item Center for Epidemiologic Studies Depression Scale. Generalized estimating equations were used to account for sibling correlation; adjusted models were constructed for each negative FB experience measure accounting for sex, race/ethnicity, social support, adolescent depressive symptoms, parental psychological distress, average monthly income, educational attainment, and employment.

Results: In a sample of 264 young adults, all negative FB experience measures were significantly associated with depressive symptoms.

Conclusions: There is a clear association between negative FB experience and depressive symptoms. Future work should examine: (1) whether negative FB experiences cause incident depression or exacerbate preexisting depression; and (2) who is most prone to being upset by negative FB experiences. With further research, recommendations for limiting or altering FB use among high-risk subpopulations could be useful in reducing depressive symptoms.

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IMPLICATIONS AND CONTRIBUTION

Negative Facebook experiences were associated with depressive symptoms. Experiences of bullying or meanness were uniquely linked to depressive symptoms; having as few as one to three negative lifetime experiences was associated with depressive symptoms. With further research, recommendations for altering Facebook use among high-risk subpopulations could be useful in reducing depressive symptoms.

In the past decade, Internet use has grown rapidly, particularly the use of social media (SM) such as Facebook (FB), which are virtual gathering places. FB has three times as many subscribers as there are U.S. citizens [1]. In a recent report, 95% of adults aged 18–33 years reported use of the Internet, the highest

proportion among any age group, 83% of whom reported SM use [1]. Research on SM use has focused on adolescents and college students; to our knowledge, there have been no studies among young adults older than college age. Yet the transition from adolescence to early adulthood is a vulnerable developmental stage in which an individual's support system (including online social supports) can influence psychopathology and risk behaviors [2–5].

The increasing use of SM, particularly during vulnerable developmental stages, has triggered interest in how its use is related to psychological and emotional states. SM can likely have

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both positive and negative effects on mental health. For example, researchers found that online social connectedness may act as an additional social medium from which a range of positive psychological outcomes can be derived [6]. However, another study found that, although FB can help college students obtain online social support, there was little effect on well-being [7]. A study conducted by FB employees found that emotions expressed by others on FB—whether positive or negative—can influence an individual's own emotions [8]. For the purposes of this research, we will be focusing specifically on negative Facebook experiences (NFEs).

Media outlets and researchers have suggested that experiences on FB may increase the risk of depression, referred to as “Facebook depression” which some believe to be triggered by spending a great deal of time using SM. In particular, there is concern that addictive SM use, cyberbullying, and the evocation of jealousy due to the constant exposure to others' personal information may lead to depression [4,9–11]. Chen and Lee [9] found evidence that both communication overload and reduced self-esteem are mechanisms by which FB interaction can influence psychological distress. Yet, Jelenchick et al. [11] found no relationship between frequency of social networking site use and depression in a college sample. Despite mixed results and media attention, there is limited research examining the relationship between SM use and mental health.

It has been suggested that negative experiences online are a common source of risk for young people. For example, in a national cross-sectional online survey of 1,588 young people ages 10–17, 33% reported online harassment in the last year; 9% reported an incident on an SM site specifically [12]. Prior research has also demonstrated the negative effects of bullying on well-being, including depression; however, limited research has been conducted on the specific nature and effects of negative SM experiences [13–15].

All studies of SM use to date have focused on characteristics of use such as comments in postings, behaviors posted in pictures, and frequency of overall use. In this study (and to our knowledge for the first time), we examined the subjective effect of SM experiences; specifically, how negative interactions with others on SM may be related to depression. Measuring the occurrence of negative interactions (rather than frequency of use or general interactions more broadly) on SM is more relevant to our theory—that negative SM experiences can lead to or exacerbate depressive symptoms. Current gaps in knowledge suggest that information is needed to confirm or refute whether a relationship exists between SM experience and depressive symptoms. We studied a cohort previously assessed during adolescence (mean age of 14), before the advent of SM, and then again when the cohort was 21–30 years old. Thus, we had a unique opportunity to use a longitudinal cohort to determine whether negative SM experiences were independently associated with depressive symptoms among young adults, accounting for adolescent depressive symptoms and parental psychological distress occurring prior to SM use.

Methods

Participants and sample

The New England Family Study (NEFS) third-generation cohort represents the third generation of participants in the NEFS, an intergenerational cohort established to follow-up the

adult offspring born to women enrolled during pregnancy as part of the U.S. Collaborative Perinatal Project from 1959 to 1966 [16]. During the Collaborative Perinatal Project, women were studied extensively during pregnancy (G1), and their offspring's (G2) development was studied through age 7 years. The NEFS was established between 2001 and 2004 to recruit a subset of the second-generation adult cohort to investigate the intergenerational transmission of tobacco use and nicotine dependence; of this group 1,674 were enrolled (74%). Information was elicited from the G2s by interviewer-administered and self-administered instruments [17]. In many cases, the G2 spouse or coparent was unavailable for interview in which case the primary G2 provided proxy information for the spouse for key psychopathology measures. More details on sampling and recruitment have been described previously [17]. This phase also entailed enrolling a sample of the third-generation adolescent, biological offspring of Collaborative Perinatal Project participants who were age eligible (e.g., between 12 and 17 years), including siblings, who had parental consent, and were living within 100 miles of study sites in Providence or Boston ($n = 564$); a baseline interview was conducted at mean age of 14 years.

Design and data collection

In 2013–2014, follow-up data collection was initiated with the third-generation cohort members who completed the adolescent baseline interview. All prior third-generation cohort members who consented to be contacted for future studies at the baseline assessment were eligible for recruitment ($n = 564$). Participants were located via contact information collected previously, as well as FB and other frequently used location services. Participants were then contacted to participate in a study about SM use. A brief explanation of study participation was given, and verbal and web-based consent were elicited for participation in a 15- to 20-minute web-based survey. Web-based data collection was performed using Illume, a product of DatStat, Inc. (Seattle, WA). Participants were compensated \$25 electronic gift certificate for their participation in this study. Among those successfully contacted ($n = 334$, 59%), there was an 80% response rate ($n = 266$). This yielded an overall response rate of 47%. All those who reported ever using FB were eligible for inclusion in the analytic sample ($n = 264$). Given the overall response rate, the eligible sample was significantly more female and white, non-Hispanic than the total third-generation cohort ($n = 564$), yet not significantly different by adolescent depressive symptoms, parental household income, parental education, or parental psychological distress. The final analytic sample included 197 families with 53 sibling pairs and seven sibling triplets. Despite this relatively small sample size, we have used a cohort to leverage the opportunity to account for parental psychological distress and prior adolescent depressive symptoms. This study protocol was approved by the university institutional review board.

Measures

Primary outcome. Depressive symptoms, as measured by the Center for Epidemiologic Studies Short Depression Scale (CES-D 10), were the primary outcome. The CES-D is a screening tool commonly used to identify depressive symptoms among the general population. The scale's validity and reliability to detect clinical and nonclinical depressive symptoms have been

Table 1
Definitions of measures of negative experiences on Facebook

	Definition
Lifetime experience	
Bullying or meanness (1)	Responded “yes” to “Throughout your use of Facebook, have you ever encountered bullying or meanness?”; “no” and “do not know” response categorized as no lifetime experience
Unwanted contact (2)	Responded “yes” to “Throughout your use of Facebook, have you ever encountered unwanted contact?”; “no” and “do not know” response categorized as no lifetime experience
Misunderstandings (3)	Responded “yes” to “Throughout your use of Facebook, have you ever encountered misunderstandings?”; “no” and “do not know” response categorized as no lifetime experience
Any negative experience (4)	Categorized as having lifetime experience for any of (1–3); else no lifetime experience
Past-year experience	
Bullying or meanness (1A)	Categorized as having lifetime experience (1) and response to “How old were you when an experience of bullying or meanness on Facebook occurred most recently?” was within 1 year of reported current age; else no past-year experience
Unwanted contact (2A)	Categorized as having lifetime experience (2) and response to “How old were you when an experience of unwanted contact on Facebook occurred most recently?” was within 1 year of reported current age; else no past-year experience
Misunderstandings (3A)	Categorized as having lifetime experience (3) and response to “How old were you when misunderstandings on Facebook occurred most recently?” was within 1 year of reported current age; else no past-year experience
Any negative experience (4A)	Categorized as having past-year experience for any of (1A–3A); else no past-year experience
Number of lifetime experiences	
Bullying or meanness (1B)	None: categorized as no lifetime experience (1); one to three: categorized as having lifetime experience (1); response to “How many times has this occurred?” was one, two, or three; and four or more: categorized as having lifetime experience (1) and response to “How many times has this occurred?” was four or more
Unwanted contact (2B)	None: categorized as no lifetime experience (2); one to three: categorized as having lifetime experience (2); response to “How many times has this occurred?” was one, two, or three; and four or more: categorized as having lifetime experience (2) and response to “How many times has this occurred?” was four or more
Misunderstandings (3B)	None: categorized as no lifetime experience (3); one to three: categorized as having lifetime experience (3); response to “How many times has this occurred?” was one, two, or three; and four or more: categorized as having lifetime experience (3) and response to “How many times has this occurred?” was four or more
Any negative experience (4B)	None: categorized as no lifetime experience for all (1–3); one to three: categorized as having lifetime experience for any (1–3) and cumulative number of experiences (1–3) was one, two, or three; and four or more: categorized as having lifetime experience for any (1–3) and cumulative number of experiences (1–3) was four or more
Severity of upset for most recent experience	
Bullying or meanness (1C)	0 if categorized as no lifetime experience (1); if categorized as having lifetime experience (1), 1–10 based on response to “How upsetting was this most recent experience of bullying or meanness on Facebook to you on a scale of 1 through 10 where 1 is “not at all upsetting” and 10 is “extremely upsetting”
Unwanted contact (2C)	0 if categorized as no lifetime experience (2); if categorized as having lifetime experience (1), 1–10 based on response to “How upsetting was this most recent experience of bullying or meanness on Facebook to you on a scale of 1 through 10 where 1 is “not at all upsetting” and 10 is “extremely upsetting”
Misunderstandings (3C)	0 if categorized as no lifetime experience (3); if categorized as having lifetime experience (1), 1–10 based on response to “How upsetting was this most recent experience of bullying or meanness on Facebook to you on a scale of 1 through 10 where 1 is “not at all upsetting” and 10 is “extremely upsetting”
All negative experiences (4C)	0 if categorized as no lifetime experience for all of 1–3; if categorized as having lifetime experience for any of 1–3, average severity of upset for 1C–3C
Severity of upset for most recent past-year experience	
Bullying or meanness (1D)	Same value as 1C if categorized as having past-year experience (1A); else 0
Unwanted contact (2D)	Same value as 2C if categorized as having past-year experience (2A); else 0
Misunderstandings (3D)	Same value as 3C if categorized as having past-year experience (3A); else 0
Any negative experience (4D)	0 if categorized as no past-year experience for all of 1A–3A; if categorized as having past-year experience for any of 1A–3A, average severity of upset for those past year (1C–3C)

previously established [18]. The CES-D 10 consists of 10 items. Participants with a score of 10 or more were considered to have depressive symptoms [19].

Primary exposures. Participants were first asked, “Have you ever used Facebook?” All those responding “yes” were eligible to answer questions about negative SM experiences. Negative SM experiences were based on two gender-specific focus groups and an article by Christofides et al. [5]. In 2011, we conducted two gender-specific focus groups, recruiting via Craigslist and posting flyers; participants were in the same age group (21–30 years) as those in this study population. The focus group discussions elicited descriptions of both negative and positive SM experiences. Results from thematic analyses of the focus groups as well as findings from other qualitative

research were used to identify different types of NFEs: (1) bullying or meanness; (2) unwanted contact; and (3) misunderstandings [5].

Negative SM experiences were measured in several ways. For each type of experience (e.g., bullying or meanness, unwanted contact, misunderstandings, or any negative experience), participants were asked about lifetime experience, past-year experience, number of lifetime experiences (none, 1–3, or 4 or more), severity of upset from most recent experience (continuous: from 0 to 10; also averaged across types), and severity of upset of most recent past-year experience (continuous: from 0 to 10; also averaged across types). The detailed definition for these negative experiences is in Table 1. All of these measures were found to have good test-retest reliability in a follow-up 2–6 weeks later.

Other covariates. Sex was categorized as male or female. Age was asked at the time of the survey and considered as a continuous variable. Race/ethnicity was categorized as white, non-Hispanic versus all others. Participants were considered to have social support if they responded “always” or “usually” to the question, “How often do you get the social and emotional support you need?” Daily FB use was determined by responses to the question, “When using Facebook over the past year, how frequently did you use Facebook?” Those participants who responded “multiple times per day” or “daily” were categorized as daily FB users. All those who responded “a few times per week,” “weekly,” “less than weekly,” or “not at all” were categorized as not being daily FB users. Average monthly income was categorized as: <\$500, \$500–\$1,499, \$1,500–\$2,499, \$2,500 or more, and do not know. Educational attainment was categorized as having a high school/GED or less versus having more than a high school education. Participants were categorized as employed if they indicated full-time or part-time employment.

Depressive symptoms in the adolescent baseline assessment were measured by a module from the National Comorbidity Survey Adolescent Supplement, an adapted version of the World Health Organization’s Composite International Diagnostic Interview [20]. Specifically, adolescent depressive symptoms were characterized by a “yes” response to the question, “Over the past year have you ever had periods that lasted several days or longer when you felt sad or depressed?” All those who responded “yes” were categorized as having adolescent depressive symptoms.

Self-reported parental psychological distress at baseline was assessed using the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition criteria for at least one major depressive episode. When available, self-reports were used for both biological parents. In many cases, however, this information was not available. In these instances, spousal responses to the following question were used: “Was (name) ever treated for a psychological or emotional problem? This could include staying overnight in a hospital or treatment facility, taking medicine, or seeing a psychiatrist, psychologist, social worker, doctor, or other health professional.” An affirmative response was used to identify a history of psychological distress for the parent reported on. Based on responses to these questions, parental psychological distress was categorized as “none” when both parents had no history of psychological distress, “some” when at least one parent had a history of psychological distress, or “unknown” when both parents had missing information or when one parent had no history of major depressive episode while the other’s status was missing.

Statistical analysis

All analyses controlled for the nonindependence of siblings enrolled into the study using generalized estimating equations. First, we examined the social and demographic characteristics by depressive symptoms in bivariate analyses. Next, we calculated crude and adjusted odds ratios of depressive symptoms for all NFE measures. Adjusted models were constructed for each exposure of interest accounting for sex, race/ethnicity, social support, adolescent depressive symptoms, parental psychological distress, average monthly income, educational attainment, and employment—all measures previously found to be associated with depression—as well as daily FB use, which was previously linked to an increase in negative online experiences [21–25]. All models were specified with the binomial

Table 2

Social and demographic characteristics of young adults aged 21–30 years in the third-generation New England Family Study by depressive symptomatology

	N = 264 (%)	Depressive symptoms	
		N = 63 (24%)	p value
Female	157 (59)	36 (57)	.677
White, non-Hispanic	237 (90)	53 (85)	.176
Social support	204 (77)	30 (48)	<.001
Adolescent depressive symptoms	91 (35)	32 (51)	.002
Daily Facebook use	201 (76)	48 (76)	.935
Parent psychological distress			.030
None	125 (47)	21 (33)	
Some	83 (32)	25 (40)	
Unknown	56 (21)	17 (27)	
Average monthly income			.002
<\$500	31 (12)	13 (21)	
\$500–\$1,499	71 (27)	20 (32)	
\$1,500–\$2,499	69 (26)	14 (22)	
\$2,500 or more	81 (31)	10 (16)	
Do not know	12 (4)	6 (9)	
More than high school education	157 (59)	26 (41)	.001
Employed	214 (81)	41 (65)	<.001

p values were generated using generalized estimating equations to account for sibling correlation using the binomial family, a logit link function, and an exchangeable correlation structure. All bold p values indicate significance at an $\alpha = .05$ threshold. Depressive symptomatology was assessed by the Center for Epidemiologic Studies Short Depression Scale (CES-D 10) using a cutoff score of ≥ 10 .

distribution, a logit link function, and an exchangeable correlation structure. All statistical analyses were conducted using Stata, version 12 [26].

Results

More than half of the sample was female (59%) and white, non-Hispanic (90%) (Table 2). Most participants reported having a lifetime negative experience (82%), having a past-year negative experience (55%), and having four or more lifetime NFEs (63%). Unwanted contact and misunderstandings were the most common lifetime NFEs (61% each). Yet, the most recent experience of bullying or meanness was the most upsetting (among those having the experience, mean = 4.57, standard deviation = .25; Table 3).

Among the full analytic sample, CES-D scores ranged from 0 to 30 with a mean of 6.56 (standard deviation = .33). Sixty-three participants (24%) were categorized as having depressive symptoms based on their CES-D scores. Young adults with social support, who were employed, who had more than a high school education, and higher average monthly income were significantly less likely to have depressive symptoms. Those with a history of parental psychological distress or adolescent depressive symptoms were more likely to have depressive symptoms in young adulthood (Table 2).

Lifetime negative FB experiences

Examination of crude relationships between NFEs and current depressive symptoms showed that those who reported lifetime NFEs of any type (e.g., bullying or meanness, unwanted contact, misunderstandings, or any negative experience) had greater odds of depressive symptoms (Table 3). These significant relationships remained in fully adjusted models.

Table 3

Odds of depressive symptoms associated with different types of negative Facebook experiences using generalized estimating equations to account for sibling relationship among young adults aged 21–30 years

	N = 264 (%)	Depressive symptoms	
		Crude (95% CI)	Adjusted (95% CI) ^a
Lifetime experience			
Bullying or meanness	115 (44)	2.75 (1.53, 4.91)	3.45 (1.73, 6.88)
Unwanted contact	161 (61)	2.08 (1.12, 3.88)	2.51 (1.20, 5.28)
Misunderstandings	161 (61)	2.25 (1.19, 4.24)	2.83 (1.31, 6.09)
Any negative experience	217 (82)	2.54 (1.01, 6.39)	3.21 (1.11, 9.31)
Past-year experience			
Bullying or meanness	44 (18)	1.40 (.67, 2.93)	1.53 (.63, 3.69)
Unwanted contact	94 (37)	1.86 (1.04, 3.35)	1.98 (.98, 3.98)
Misunderstandings	95 (38)	2.12 (1.19, 3.80)	2.60 (1.28, 5.30)
Any negative experience	143 (55)	2.21 (1.19, 4.09)	2.33 (1.12, 4.85)
Number of lifetime experiences			
Bullying or meanness			
None	149 (58)	1.00 (ref)	1.00 (ref)
One to three	47 (18)	3.06 (1.47, 6.37)	4.06 (1.73, 9.52)
Four or more	59 (23)	2.54 (1.27, 5.10)	2.89 (1.22, 6.87)
Unwanted contact			
None	103 (41)	1.00 (ref)	1.00 (ref)
One to three	70 (28)	1.63 (.77, 3.48)	1.50 (.59, 3.79)
Four or more	81 (32)	2.46 (1.23, 4.91)	3.06 (1.36, 6.89)
Misunderstandings			
None	103 (41)	1.00 (ref)	1.00 (ref)
One to three	49 (19)	2.13 (.94, 4.83)	2.59 (.94, 7.10)
Four or more	101 (40)	2.33 (1.18, 4.62)	2.94 (1.29, 6.72)
Any negative experience			
None	47 (19)	1.00 (ref)	1.00 (ref)
One to three	44 (18)	1.12 (.33, 3.83)	1.22 (.27, 5.42)
Four or more	158 (63)	3.15 (1.24, 8.05)	3.87 (1.31, 11.45)
Mean (SD) among those having experience			
Severity of upset for most recent experience			
Bullying or meanness	4.57 (.25)	1.21 (1.10, 1.33)	1.25 (1.11, 1.41)
Unwanted contact	3.61 (.21)	1.23 (1.11, 1.37)	1.19 (1.05, 1.34)
Misunderstandings	4.19 (.20)	1.14 (1.03, 1.26)	1.16 (1.03, 1.32)
All negative experiences	2.74 (.15)	1.34 (1.17, 1.53)	1.36 (1.15, 1.61)
Severity of upset for most recent past-year experience			
Bullying or meanness	4.55 (.43)	1.09 (.97, 1.23)	1.09 (.95, 1.25)
Unwanted contact	3.48 (.29)	1.22 (1.10, 1.37)	1.17 (1.03, 1.34)
Misunderstandings	4.13 (.26)	1.14 (1.03, 1.27)	1.13 (1.00, 1.28)
Any negative experience	2.23 (.16)	1.29 (1.11, 1.50)	1.26 (1.04, 1.51)

All models use generalized estimating equations to account for sibling correlation with the binomial distribution and logit link function. Bold results indicate statistical significance with $p < 0.05$.

^a Adjusted for sex, race/ethnicity, social support, adolescent depressive symptoms, daily Facebook use, parental psychological distress, average monthly income, educational attainment, and employment.

Past-year negative FB experiences

Past-year NFEs were also associated with current depressive symptoms; this was true for all negative experience types except for bullying or meanness (Table 3). In the fully adjusted models, significant positive relationships between past-year misunderstandings and depressive symptoms as well as any past-year negative FB experience and depressive symptoms remained.

Number of lifetime negative FB experiences

For each NFE type, having four or more experiences was associated with having depressive symptoms compared to having none. For bullying or meanness only, those reporting one to three experiences had 3.06 95% confidence interval (1.47, 6.37) times the odds of depressive symptoms compared to those reporting none (Table 3). In adjusted models these significant relationships remained.

Severity of upset for most recent negative FB experiences

With each unit increase in reports of upset for most recent experiences of bullying or meanness, unwanted contact, or misunderstandings, participants had significantly greater odds of depressive symptoms. Similarly, with each unit increase in average reports of upset for all types of negative experience, participants were significantly more likely to have depressive symptoms. All significant associations remained in the fully adjusted models (Table 3).

Severity of upset for most recent past-year negative FB experiences

Finally, when considering severity of upset for only past-year experiences, with each unit increase in reports of upset for experiences of unwanted contact, misunderstandings, or the average for all negative experience types, participants were significantly more likely to have depressive symptoms.

In adjusted models, these significant relationships remained (Table 3).

Discussion

This study aimed to examine the relationship between negative experiences on FB and depressive symptoms. Findings suggest the lifetime, past-year, lifetime number, and severity of upset of most recent and most recent past-year negative FB experiences were all associated with depressive symptoms. Similar to other nationally representative young adult samples, 24% of participants in this study were categorized as having self-reported depressive symptoms based on their CES-D scores [27]. Also, similar to previous literature, low social support, adolescent depressive symptoms, parental psychological distress, lower income, less education, and being unemployed were all associated with self-reported depressive symptoms [22–24].

Lifetime negative FB experiences

We assessed whether having lifetime negative FB experiences was associated with depressive symptoms. Lifetime experience could have occurred as early as 2004, when FB was created. It was important to assess lifetime experience because a traumatic experience on FB in adolescence or young adulthood could potentially have long-term effects on depressive symptoms, or may be reflective of long-term depression risk. For lifetime experiences, reports of all NFE types were strongly associated with depressive symptoms.

Young people who are depressed and have low self-worth are more likely to be bullied, while other research suggests that being involved in bullying causes subsequent depression [28–30]. The same may be true for online bullying and unwanted contact.

Misunderstandings on FB may be indicative of stressful life events; this is supported by Christofides et al. [5] qualitative research, in which study participants' reported examples of misunderstandings on FB as "when information posted online lead to issues with friends or a boss." Stressors and stressful life events, particularly in young adulthood, have been repeatedly linked to depression [31–33].

Past-year negative FB experiences

In contrast to all lifetime NFEs, assessing only past-year negative experiences helped us to understand whether a recent NFE was more strongly associated with depressive symptoms. However, evidence from the findings suggest that past-year NFE was not more strongly associated with depressive symptoms than having a lifetime experience, specifically for bullying or meanness and unwanted contact. This suggests that having an NFE in adulthood, specifically bullying or meanness or unwanted contact, may be less distressing than in adolescence.

Number of lifetime negative FB experiences

We also assessed the association between the number of lifetime NFEs a person had and depressive symptoms, attempting to detect any threshold effect that might exist. Having four or more experiences of any type of negative FB experience were all associated with depressive symptoms. Each of these negative experiences is likely to cause some form of social stress. Having

frequent experiences of this sort may cause a young person to have chronic stress. Similar to the effects of a stressor or stressful life event, chronic stress is known to be associated with depression [34,35].

Importantly, for experiences of bullying or meanness on FB, having one to three experiences was also associated with depressive symptoms. This implies that experiences of bullying or meanness on FB are unique; having even a single experience of bullying or meanness on FB was associated with depressive symptoms, while individuals needed to have at least four experiences of other types to exhibit the same association with depressive symptomatology.

Severity of upset for most recent negative FB experiences

It was important to assess the severity of upset resulting from a person's most recent NFE because, for certain NFE types, how upsetting the experience was, rather than just having the experience, may be driving its association with depressive symptoms. The more upsetting a person's most recent NFE was rated, the more likely they were to also self-report depressive symptoms. The severity of upset reported from these experiences may be correlated with the amount of life stress resulting from that particular experience; the more stressful the experience, the more likely a person is to be depressed [31–33]. This variation in upset that we observed could be due to the particular context or nature of the online experience or to how prone a person is to being upset by online negative experiences, such as one's fear of negative evaluation.

Severity of upset for most recent negative FB experiences

In contrast to upset from most recent NFEs, assessing upset from most recent past-year NFEs helped us to understand whether upset from a recent NFE was more strongly associated with depressive symptoms. However, upset from most recent past-year NFEs was not more strongly associated with depressive symptoms than upset from most recent lifetime NFE, specifically for bullying or meanness. Therefore, upset from an NFE in young adulthood, specifically bullying or meanness, may be less distressing than upset from bullying or meanness on FB in adolescence.

Limitations

There are several limitations of this study. First, we do not know if reported negative experiences preceded the onset of depressive symptoms. Therefore, having depressive symptoms could increase one's risk for NFEs or cause one to be more upset by an NFE. Fortunately, we were able to control for preexisting depressive symptoms in adolescence prior to any NFE. Second, measures of NFE may be prone to recall bias. For example, participants may not remember NFEs from as early as 2004 when FB first started. Those who had more salient or more upsetting experiences may be more likely to remember the experiences, leading to differential misclassification of the exposure and potentially overestimating the association with depressive symptoms. Mitigating this concern, the reports of NFEs were found to be reliable in test-retest analysis. Third, questions regarding NFEs were consistently asked prior to the CES-D 10 assessment for all participants. Potentially, answering questions about NFEs could introduce a priming effect for reporting more

depressive symptoms in the CES-D 10 assessment. Finally, the sample is predominantly white, non-Hispanic and majority female—and even significantly more so than the full third-generation cohort. Thus, these findings may not be generalizable to all young adults who have used FB.

In conclusion, lifetime negative FB experience, past-year negative FB experience, number of lifetime negative FB experiences, and severity of upset from most recent and most recent past-year negative experiences were all associated with depressive symptoms. Experiences of bullying or meanness on FB were uniquely linked to depressive symptoms; having as few as one to three negative lifetime experiences was associated with depressive symptoms. Future work should examine: (1) whether negative FB experiences cause incident depression or exacerbate preexisting depression; and (2) who is most prone to being upset by negative FB experiences. With further research, recommendations for limiting or altering FB use among high-risk subpopulations could be useful in reducing depressive symptoms.

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