



Published in final edited form as:

*J Affect Disord.* 2020 January 01; 260: 38–44. doi:10.1016/j.jad.2019.08.092.

## Emotional support from social media and face-to-face relationships: Associations with depression risk among young adults

Ariel Shensa<sup>a,b,\*</sup>, Jaime E. Sidani<sup>a,b</sup>, César G. Escobar-Viera<sup>a,b</sup>, Galen E. Switzer<sup>a</sup>, Brian A. Primack<sup>c</sup>, Sophia Choukas-Bradley<sup>d</sup>

<sup>a</sup>Division of General Internal Medicine, Department of Medicine, University of Pittsburgh, School of Medicine, Pittsburgh, PA, United States

<sup>b</sup>Center for Research on Media, Technology, and Health, University of Pittsburgh, Pittsburgh, PA, United States

<sup>c</sup>College of Education and Health Professions, University of Arkansas, Fayetteville, AK, United States

<sup>d</sup>Department of Psychology, University of Pittsburgh, Pittsburgh, PA, United States

### Abstract

**Background:** Emotional support is highly protective against poor mental health. Though several measures of emotional support exist, none specifically addresses social media (SM) as a source of emotional support. Therefore, the objectives of this study were to determine if SM-based emotional support is an extension of or distinct construct from face-to-face (FTF) emotional support and to assess the independent associations between each domain of emotional support and depression risk among U.S. young adults.

**Methods:** In March 2018, we surveyed 2408 18–30 year olds. We assessed perceived FTF emotional support with the brief PROMIS emotional support scale and perceived SM-based emotional support using a new four-item measure. Depression risk was assessed using the PHQ-9. We performed factor analysis (FA) to determine the underlying factor structure of all items and to develop composite scales. Multivariable logistic regression was used to examine the independent association between each resulting emotional support scale and depression risk.

**Results:** FA revealed two distinct constructs. FTF emotional support was associated with 43% lower odds of depression per 1-unit increase on the 5-point scale (AOR = 0.57, 95% CI = 0.52–

\*Corresponding author at: Center for Research on Media, Technology, and Health, 230 McKee Place Suite 600, Pittsburgh, PA 15213, United States. ariel.shensa@pitt.edu (A. Shensa).  
CRediT authorship contribution statement

**Ariel Shensa:** Conceptualization, Data curation, Formal analysis, Methodology, Writing - original draft. **Jaime E. Sidani:** Project administration, Writing - original draft, Writing - review & editing. **César G. Escobar-Viera:** Writing - original draft, Writing - review & editing. **Galen E. Switzer:** Writing - original draft, Writing - review & editing. **Brian A. Primack:** Conceptualization, Funding acquisition, Writing - review & editing. **Sophia Choukas-Bradley:** Supervision, Writing - review & editing.

Declaration of Competing Interest

The authors have no conflicts of interest to declare.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.jad.2019.08.092.

0.63). However, SM-based emotional support was significantly associated with 20% greater odds of depression per 1-unit increase on the 5-point scale (AOR = 1.20, 95% CI = 1.09–1.32).

**Limitations:** This study utilized a cross-sectional design and self-report data.

**Conclusions:** While FTF emotional support was associated with slightly lower odds of depression, SM-based emotional support was associated with slightly greater odds of depression. It may be valuable for clinicians treating individuals with depression to ask about sources of emotional support.

---

## 1. Introduction

Social support has a profound and far-reaching impact on mental and physical health and health behavior (Reblin and Uchino, 2008; Strine et al., 2008; Umberson and Montez, 2010). Emotional support—typically obtained through close relationships—is the type of social support most strongly associated with mental health outcomes (Yao et al., 2015). High emotional support has been associated with higher survival in various clinical populations and is protective against stress, anxiety, and depression (Gordillo et al., 2009; Pilkington et al., 2015; Reblin and Uchino, 2008; Soler-Vila et al., 2003). Data from the Behavioral Risk Factor Surveillance System (BRFSS) found that individuals who reported high levels of perceived emotional support were 87% less likely to report current depression (Brinker and Cheruvu, 2017). Moreover, emotionally sustaining relationship experiences in early life impact an individual's health throughout the lifespan (Umberson et al., 2010).

Traditionally, in-person, face-to-face (FTF), connections have been an effective way of obtaining emotional support. However, the way in which adolescents and young adults connect has changed dramatically with the proliferation of social media (SM). U.S. young adults spend an average of two to three hours per day on SM, contrasted with an average of 39 min per day socializing and communicating in-person (GlobalWebIndex, 2017; United States Department of Labor, 2017). Nearly 20% of U.S. young adults prefer communicating via SM compared to in-person or on the phone, and 24% report missing important moments in their life because they were trying to capture and share it on SM (Badoo, 2012). Although use of SM among young adults may present opportunities for connection and thus emotional support, SM use has been associated with lower FTF emotional support and greater social isolation, anxiety, and depression (Lin et al., 2016; Marino et al., 2018; Primack et al., 2017; Shensa et al., 2016; Vannucci et al., 2017; Yoon et al., 2019). Conversely, other research has found either mixed results or no evidence linking SM use to well-being among adolescents (Anderson and Jiang, 2018; Orben et al., 2019). Overall, the literature in this area is emerging and often conflicting. It is important to gain a more nuanced understanding of how SM use may or may not be linked to the recently documented increases in internalizing problems among some young people (Beiter et al., 2015).

Existing conceptual frameworks and measurement of emotional support are based upon traditional FTF relationships and may not address current young adult relationships often maintained or conducted using SM (Hahn et al., 2010; Zimet et al., 1988). For example, because emotional support is often characterized by perceptions of trust within a relationship (Buunk and Schaufeli, 1999; Langford et al., 1997), some existing emotional support scales

ask individuals about the extent to which they have someone to confide in (Cella et al., 2015). However, assessing relationship trust in this manner may not be translatable into the SM environment. Similarly, reciprocity, encouragement, and love—characteristics of emotionally supportive relationships—may be experienced differently in the SM environment. Indeed, a recently developed theoretical framework of adolescent peer relations in the SM context proposed that SM relations are distinct and a departure from traditional, FTF relations (Nesi et al., 2018).

Although some studies have sought to conceptualize a more integrated measure of social support, to our knowledge the specific concept of emotional support in this context has not yet been comprehensively examined (McCloskey et al., 2015; Meng et al., 2017). Preliminary findings from the broader social support literature are mixed. One study suggested that SM connectedness may be a distinct yet related construct to FTF connectedness, and that SM connectedness may be associated with lower depression (Grieve et al., 2013). Additionally, a formal scale development study found that like FTF social support, online (i.e., gaming and dating sites, texting, and social media platforms) social support was protective against depression-related outcomes, although to a slightly lesser degree (Nick et al., 2018). However, another study found that while increased frequency of FTF social contact was associated with lower odds of depression, increased social interaction on SM was not (Teo et al., 2019). Finally, a Facebook-based social support scale found that greater endorsement of the Facebook measure of emotional support, specifically, was associated with greater severity of depression and poorer psychological quality of life (McCloskey et al., 2015).

In order to take initial steps toward clarifying mixed findings surrounding SM-based support, FTF support, and depression, it would be useful to examine whether FTF and SM-based support are separate constructs. Additionally, it would be useful to conduct initial exploratory studies examining whether FTF and SM-based social support are independently associated with depression. Specifically, focusing on multi-platform SM-based support and emotional support—the type of social support most robustly associated with mental health—may hone our understanding of the complexities surrounding these associations. Therefore, this study had two exploratory aims: (1) to determine if SM-based emotional support is an extension of or distinct domain from FTF emotional support, and (2) to assess independent associations between each domain of emotional support and depression among a large, national sample of U.S. young adults. Because this study examines data from a cross-sectional survey, we will not seek to estimate directionality and instead aim to explore potential associations that can inform future research.

## 2. Methods

### 2.1. Participants and procedures

Participants were recruited online using Qualtrics Sampling Services. Qualtrics Sampling Service is a subdivision of Qualtrics, a private research software company specializing in Web-based data collection that partners with over 20 Web-based panel providers to supply diverse, quality respondents (Ibarra et al., 2018). Participants were recruited using a “balanced start” sampling methodology, which applies quotas based upon U.S. census data

in terms of age, sex, race, education, household income, and geographic region to approximate the U.S. adult population. Data were collected in March of 2018.

A total of 2408 individuals completed the survey, which contained 93 items and included a variety of items measuring social media use, self-reported mental health, and sociodemographic characteristics. Participants were required to be aged 18–30 and to respond to questionnaire items using a computer-based interface. In order to assure high quality data, several strategies were employed. First, a pilot test was conducted with 30 individuals who were not a part of the final sample to assess whether the survey was functioning properly (skip patterns, data collected for each item, etc.). Additionally, a “soft launch” was conducted on 10% of the intended final sample size ( $n = 240$ ) before full implementation of the survey so that the research team could again review the data for inconsistencies. Finally, Qualtrics employs a number of data quality checks post hoc, such as screening for a high proportion of skipped responses, participants who straight-line their answers or who “speed” (i.e., complete the survey faster than 1/3 the median completion time), or other patterns suggesting poor effort. Median time for completion was 18 min. Participants received a point incentive from Qualtrics, which can be redeemed, for example, for gift cards. This study was approved by the University of Pittsburgh Institutional Review Board.

## 2.2. Measures

**2.2.1. Face-to-face emotional support**—We assessed perceived emotional support (ES) using a 4-item scale developed by the Patient-Reported Outcomes Measurement Information System (PROMIS). PROMIS is a National Institutes of Health Roadmap initiative aiming to provide precise, reliable, valid, and standardized questionnaires measuring patient-reported outcomes across the domains of physical, mental, and social health (Cella et al., 2010, 2007; Hahn et al., 2014). The PROMIS emotional support item bank specifically aims to assess perceived feelings of being cared for and of being valued as a person (PROMIS, 2012). Participants were presented with the following items: “I have someone who will listen to me when I need to talk”; “I have someone to confide in or talk to about myself or my problems”; “I have someone who makes me feel appreciated”; and “I have someone to talk with when I have a bad day” (Table 1). Each item was followed by a Likert-type response scale with possible responses of Never (1), Rarely (2), Sometimes (3), Often (4), and Always (5). Although the scale items themselves do not specifically refer to FTF or in-person relationships, we employed several strategies to ensure face validity for our desired construct of FTF emotional support. We collaborated with a youth advisory board consisting of young adults during the development of our survey. These individuals gave specific feedback about item terminology, overall item and survey flow, and comprehensiveness of constructs. Additionally, we presented items in the survey such that one set of items specifically instructed individuals to answer based upon their use of SM and every item in the section specifically referred to SM. A different set of items—including these PROMIS emotional support items—clearly stated that individuals were going to be asked about their feelings and emotions, none of which mentioned SM.

**2.2.2. Social media-based emotional support**—We adapted the above items to assess perceived emotional support derived specifically from SM (SM-ES). We consulted with SM and social support researchers and revised the items based upon expert feedback. In order to use language that encompassed a wide range of social media platforms and experiences, items were then pilot tested prior to survey administration using the youth advisory panel mentioned above. Feedback was positive in terms of item relevance and comprehensibility. Modified items were as follows: “I have people on social media to listen to me when I need to talk”; “I have people on social media to confide in or talk to about myself or my problems”; “I have people on social media who make me feel appreciated”; and “I have people on social media to talk with when I have a bad day” (Table 1). The response scale was identical to that described above. To limit potential response bias, the SM-ES items were separated from the ES items, with the SM-ES items being presented toward the beginning of the survey, while the ES items were presented toward the end of the survey, with 20 different items in between.

**2.2.3. Depression risk**—We assessed depression risk using the nine-item Patient Health Questionnaire (PHQ-9), which asks how often over the past two weeks participants have been bothered by any of the following: Little interest or pleasure doing things; Feeling down, depressed, or hopeless; Trouble falling asleep, or sleeping too much; Feeling tired or having little energy; Poor appetite or overeating; Feeling bad about yourself—or that you are a failure or have let yourself or your family down; Trouble concentrating on things, such as reading the newspaper or watching television; Moving or speaking so slowly that other people could have noticed? Or the opposite—being so fidgety or restless that you have been moving around a lot more than usual; Thoughts that you would be better off dead or of hurting yourself in some way. Response options included: Not at all (0), Several days (1), More than half of the days (2), or Nearly every day (3). Responses were summed to create a composite scale ranging from 0 to 27. We categorized the scale into low risk (0–9), encompassing none to mild symptomology, and high risk (10–27), encompassing moderate to severe symptomology, based upon validated and recommended clinical cut-points (Kroenke et al., 2001). Internal consistency reliability calculated with Cronbach’s alpha was 0.87 in this sample.

**2.2.4. Personal and sociodemographic covariates**—We assessed daily time spent on SM, adverse childhood experiences (ACE), age, sex, race/ethnicity, education, household income, relationship status, and living situation via self-report. Daily time spent on SM was measured using one item that asked individuals “On average, how much time per day do you spend on social media for personal use (not work related)?” Responses were converted to hours for analysis. ACE was assessed using a modified 6-item version of the Adverse Childhood Experiences questionnaire, which asked about individuals’ experiences before turning 18 years old such as, “Were your parents separated or divorced?” and “Did you live with anyone who was depressed, mentally ill, or suicidal?” Response options were Yes (1) or No (0) (Chapman et al., 2004). Items were summed to create a scale with scores ranging from 0 to 6. Age, in years, was measured as a continuous variable. Sex at birth was assessed as male/female. Race/ethnicity was assessed as White, non-Hispanic; Black, non-Hispanic; Hispanic; Asian; Other; or Multiracial and collapsed into two categories in multivariable

analyses (White, non-Hispanic or Other) for model stability. Education (high school or less/some college or technical school/college graduate/graduate school), household income (less than \$25,000, \$25,000 to \$49,999, \$50,000 to \$74,999, \$75,000 or above), and living situation (by myself, with parent or guardian, with significant other, other) were each divided into four categories. Relationship status (single, member of an unmarried couple, married) was divided into three categories.

### 2.3. Statistical analysis

We included all participants with complete data on the eight emotional support and nine depression items. We examined the data for patterns of missingness, and used Chi-square and Kruskal–Wallis tests to assess for differences in sociodemographic and personal characteristics between those with and without missing data. Additionally, we assessed the data for unreasonable or unfeasible responses (i.e., reporting using SM more than 18 h per day).

Because we included four additional emotional support items that had been modified from the previously validated version (by assessing emotional support from SM specifically), we performed a factor analysis (FA) using the principal factor (PF) estimation method with oblique rotation to examine the underlying factor structure of these eight items. We used several recommended criteria to determine the best factor solution (Costello and Osborne, 2005). First, we assessed the individual item factor loadings, with those below 0.50 or crossloading indicating items should be considered for removal. Then, we examined the eigenvalues, looking for factors with eigenvalues over 1. Next, we visually examined the factor structure using a scree plot, looking for the point at which there is a transition from vertical to horizontal in the line. We assessed the uniqueness—the percentage of variance for each variable that is not explained by the common factors—considering values greater than 0.60 high and therefore not well explained by the factors. Having made a decision on the factor-solution, we then calculated the internal consistency of items using Cronbach's alpha and created summary scale(s).

We described our sample and examined the associations between each factor, personal characteristic, and depression using Chi-square tests for categorical variables and Wilcoxon rank-sum tests for continuous variables. Bivariable logistic regression models were used to assess associations between each emotional support scale, and each covariate with depression risk. To screen our model for multicollinearity among the independent variables and covariates, we calculated the variance inflation factors (VIFs). We then used a multivariable logistic regression model, including SM-ES, ES, and all covariates to assess the independent association between each emotional support scale and depression risk. We decided a priori to include all sociodemographic and social media use characteristics in our multivariable model—regardless of statistical significance in bivariable analyses—based upon their prior associations with depression (Akhtar-Danesh and Landeen, 2007; Chapman et al., 2004; Lin et al., 2016; National Institutes of Mental Health, 2017). Using the Wald test for significance as well as the Likelihood Ratio Test to compare model fit, we tested for interaction effects in our model between each emotional support scale and sex, as prior



research has demonstrated that males and females often perceive emotional support differently (Aukett et al., 1988; Strine et al., 2008).

In all logistic regression models, we incorporated design-specific survey weights provided by Qualtrics in order to estimate effects for the general U.S. population of 18 to 30 year olds as well as adjust for any under- or over-sampling in terms of key demographic factors based upon the most recent U.S. census data. Statistical analyses were performed with Stata 15.0 and two-tailed  $p$  values of  $<.05$  were considered significant.

We performed three planned sensitivity analyses to examine the robustness of our results and address areas of potential bias. First, we conducted our multivariable analysis using linear regression and operationalizing depression risk as a continuous variable. Second, we conducted the multivariable analysis using no survey weights. Third, we conducted the multivariable analysis using only a parsimonious set of covariates that had a bivariable association of  $p < .10$  with depression risk.

### 3. Results

#### 3.1. Participants

Our final sample consisted of 2375 individuals with complete data on our primary variables of interest and after removing 14 individuals who reported using SM more than 18 h per day. There were no significant differences between those with and without complete data in terms of sociodemographic or personal characteristics ( $p$  values ranging from .05 to .92). Based on the low frequency of missing data (1.4%) and the likelihood of those missing at random (MAR), we used casewise deletion to isolate our final sample. Our sample was approximately half female (51%) and the majority was White, non-Hispanic (68.5%) with at least some college or technical school education (86.2%). Complete sociodemographic information is presented in Table 2.

#### 3.2. Factor analysis

Pairwise correlations between all eight emotional support items ranged from 0.02 (ES1 and SM-ES4) to 0.88 (ES1 and ES2). Factor analysis yielded a clear 2-factor solution, with eigenvalues on Factor 1 and Factor 2 of 3.46 and 3.00, respectively. All four PROMIS items loaded on Factor 1, ranging in value from 0.88 to 0.92. All four adapted SM-ES items loaded on Factor 2, ranging in value from 0.82 to 0.92. The two-factor solution accounted for 82% of the variance among all eight items. Uniqueness values ranged from 0.14 to 0.32, indicating the items were well explained by the factors. The rotated factors had a correlation of 0.07. We calculated a raw summary score for each factor ranging from 4 to 20. Scales were then divided by 4 to aid in interpretation, resulting in two scales—ES and SM-ES—each ranging from 1 to 5. Internal consistency reliability for the resulting ES and SM-ES scales was 0.95 and 0.94, respectively (Table 1).

#### 3.3. Logistic regression

In bivariable logistic regression models, a 1-unit increase in ES was significantly associated with 44% lower odds of depression (OR = 0.56, 95% CI = 0.51–0.61), whereas a 1-unit

increase in SM-ES was significantly associated with 24% greater odds of depression (OR = 1.24, 95% CI = 1.15–1.34). In the multivariable model including both ES, SM-ES and all personal and sociodemographic covariates, a 1-unit increase in ES was significantly associated with 43% lower odds of depression (AOR = 0.57, 95% CI = 0.52–0.63), whereas a 1-unit increase in SM-ES was associated with 20% greater odds of depression (AOR = 1.20, 95% CI = 1.09–1.32). There was no evidence of multicollinearity among ES, SM-ES and covariates with VIFs ranging from 1.07 to 1.40. Complete bivariable and multivariable results are presented in Table 3.

We found a significant interaction effect between ES and sex ( $p < .001$ ), the inclusion of which improved overall model fit ( $p < .001$ ). Although ES was significantly associated with depression for both females and males, the magnitude varied. A 1-unit increase in ES was significantly associated with 30% lower odds of depression for females compared to males (AOR = 0.70, 95% CI = 0.58–0.85). There was not a significant interaction effect between SM-ES and sex ( $p = .54$ ).

### 3.4. Sensitivity analyses

Replicating our multivariable analysis using linear regression and operationalizing depression as a continuous variable, a 1-unit increase in ES was significantly and independently associated with lower depression ( $B = -1.50$ ,  $t = 11.83$ ,  $p < .001$ ); whereas a 1-unit increase in SM-ES was significantly and independently associated with greater depression ( $B = 0.43$ ,  $t = 4.65$ ,  $p < .001$ ). When we conducted our primary multivariable logistic regression model using no survey weights, ES and SM-ES were associated with lower and greater odds of depression, respectively (AOR = 0.57, 95% CI = 0.52–0.64 and AOR = 1.25, 95% CI = 1.14–1.37). Finally, repeating our multivariable logistic regression model including a more parsimonious set of covariates that had bivariable associations of  $p < .10$  with depression, ES was associated with lower odds of depression (AOR = 0.58, 95% CI = 0.52–0.64) and SM-ES was associated with greater odds of depression (AOR = 1.21, 95% CI = 1.10–1.32).

## 4. Discussion

This cross-sectional study of a large national sample of young adults found that emotional support from social media (SM-ES) was a distinct construct from traditional, face-to-face (FTF) emotional support (ES). Additionally, our scale demonstrated strong psychometric properties, suggesting that it can be used as a brief assessment of SM-based emotional support. Although this study did not assess the directionality of associations, we found that SM-ES was independently associated with slightly greater odds of depression, while ES was associated with slightly lower odds of depression. These findings reflect existing research on the distinctions between FTF and SM-based support in general and their associations with mental health, although the associations found in our study appear to be smaller in magnitude (McCloskey et al., 2015; Teo et al., 2019). However, our findings differ from some prior studies that showed that like FTF emotional support, online support was associated with lower depression (Grieve et al., 2013; Nick et al., 2018).



In this study, we found a slight positive association between SM-ES and depression risk, after controlling for ES and a comprehensive set of related covariates. This finding suggests that SM-based emotional support may not function in the same way as traditional FTF emotional support in terms of a mental health benefit. This may be due to the fundamentally different nature of SM, as compared to FTF or non-SM, interactions. For example, SM interactions may lack the full range of interpersonal cues and the direct interpersonal connection that make social support effective (Frison and Eggermont, 2015). Indeed, research has found that SM interactions differ from FTF interactions in a number of fundamental ways that may transform the experience of social support for young people (Nesi et al., 2018). For example, the reduction of interpersonal cues, the allowance of asynchronous interactions, and the focus on quantifiable indicators of peer approval within the SM environment may alter perceptions of support (Nesi et al., 2018).

The slight positive association between SM-ES and depression risk may also be due to some SM-specific exposures within the SM environment that increase the risk of depressive symptoms. Prior research has found that certain types of SM experiences, such as passive use (as opposed to active; Escobar-Viera et al., 2018), having a greater proportion of strangers as SM contacts (Shensa et al., 2018), and exposure to negative experiences on SM (Primack et al., 2018) are associated with greater risk of depression. Additionally, several studies have found that individuals who engage in excessive reassurance-seeking and problematic social comparison on SM report increases in depressive symptoms and decreases in self-esteem over time (Clerkin et al., 2013). One study found that young adults with lower self-esteem engaged in greater levels of negative self-disclosure on Facebook, and these posts received fewer “likes” and comments, which may potentially lead to depressive symptoms (Forest and Wood, 2012). It may be beneficial for future research to assess these aspects of SM use in conjunction with SM-ES and depression.

It is also plausible, given the cross-sectional nature of this study, that individuals with depression tend to perceive SM as a source of emotional support to a greater extent than do non-depressed individuals. Some research has found that for individuals with related mental health conditions, SM may be perceived as preferable to FTF connection and as a potential source of support (Indian and Grieve, 2014; Moreno et al., 2011; Sampasa-Kanyinga and Lewis, 2015). However, in our study, SM-ES and ES were not negatively correlated and ES was included in the multivariable model, which suggests that SM-ES was not necessarily displacing ES. Therefore, it is unlikely that depressed individuals perceive SM to be a source of emotional support simply because they lack FTF emotional support. An alternative possibility is that when people are depressed, they perceive social support differently than their non-depressed peers (Park et al., 2016). Additionally, it may be that our findings are consistent with research indicating that depressive symptoms increased when social support was sought on Facebook but perceived to not occur (Frison and Eggermont, 2015). Future research will benefit from a more nuanced investigation of the complexities surrounding these associations. Although our study results should be interpreted with caution, they may have clinical implications for individuals who are at risk for depression. Specifically, identifying SM as a source of support may not be an effective replacement for FTF social interaction in promoting positive mental health.

Factor analysis of eight emotional support items—four items from a validated measure of traditional emotional support and four SM-specific items adapted from this measure—revealed two distinct factors. Although some research has suggested that SM is an extension of or opportunity to enhance our FTF social networks (Rozzell et al., 2014), these findings indicate it is likely not. SM does offer features to express support such as liking a post or leaving an encouraging comment, but such gestures of emotional support may not function in the same way as verbal or bodily expressions of support. This finding is consistent with research that found that parasocial and social relationships were differentially associated with psychological well-being (Baek et al., 2013). Looking more closely at what characterizes FTF emotional support—perceptions of reciprocity, being valued, and encouragement in relationships—it is understandable how these characteristics may be less potent and subsequently less valuable in the SM environment (Buunk and Schaufeli, 1999; Langford et al., 1997).

Our study found that there was no difference in the slight positive association between SM-ES and depression risk between females and males. This result suggests that the effect of perceiving SM to be a source of emotional support may be a risk factor for depression, regardless of sex. This finding is contrary to that of the association between ES and depression risk, which differed for females and males. Although the association was significant and negative for both, the magnitude of the association was greater for females than for males. This may be valuable information for informing interventions and recommendations, as well as for clinicians treating young adults.

#### 4.1. Limitations

This study had several limitations. First, we did not conduct a formal scale development study to measure SM-ES. However, we chose to adapt items, which is recommended as a preferable method when a modifiable scale is available (DeVellis, 2012). Second, while it could be assumed that individuals understood the difference between the ES and SM-ES items based upon content and the ordering and instructions within the survey, the ES items did not explicitly state that they were referring solely to FTF or in-person relationships. Therefore, it is possible that some individuals considered perceived support through other means such as texts, telephone, or even SM when answering these items. Third, the magnitude of the association between SM-ES and depression was small, such that the statistical significance could be due in part to a high false positive rate among large samples (Ferguson, 2009). Therefore, results should be interpreted with caution. Fourth, because this study was exploratory and utilized cross-sectional data, directionality of associations cannot be determined. It may be valuable for future research to utilize an alternative study design, such as semi-structured interviews with depressed individuals, to gain a greater understanding of the directionality of the associations found in the study. Finally, our sample consisted of a national sample of adults ages 18 to 30; therefore, results cannot be generalized to a younger or older non-U.S. population, for example.

## 5. Conclusion

This cross-sectional study found that emotional support derived FTF and emotional support derived via SM are two distinct constructs. Although FTF emotional support was associated with slightly lower odds of depression, emotional support related to SM was associated with slightly greater odds of depression. The accessibility of SM makes it an inviting option for connecting with others, particularly for individuals who are geographically or socially isolated, mobility-, or time-impaired. However, these findings indicate that FTF and SM connections may not be equally valuable in terms of protection against depression risk. Future longitudinal and qualitative studies may help further elucidate the direction of these associations.

## Acknowledgements

We acknowledge Michelle Woods for her editorial assistance.

### Funding

This work was supported by the Fine Foundation.

## References

- Akhtar-Danesh N, Landeen J, 2007 Relation between depression and sociodemographic factors. *Int. J. Ment. Health Syst* 1, 4 10.1186/1752-4458-1-4. [PubMed: 18271976]
- Anderson M, Jiang J, 2018 Teens, social media & technology 2018 [WWW document]. Pew Res. Cent URL. <http://www.pewinternet.org/2018/05/31/teens-social-media-technology-2018/> (Accessed 6.25.19).
- Aukett R, Ritchie J, Mill K, 1988 Gender differences in friendship patterns. *Sex Roles* 19, 57–66. 10.1007/BF00292464.
- Badoo, 2012 Generation lonely? 39 Percent of Americans spend More Time Socializing Online Than Face-To-Face [WWW Document]. URL. <http://www.marketwired.com/press-release/generation-lonely-39-percent-americans-spend-more-time-socializing-online-than-face-1648444.htm?mwfsmw> (Accessed 6.24.19).
- Baek YM, Bae Y, Jang H, 2013 Social and parasocial relationships on social network sites and their differential relationships with users' psychological well-being. *Cyberpsychol. Behav. Soc. Netw* 16, 512–517. 10.1089/cyber.2012.0510. [PubMed: 23697533]
- Beiter R, Nash R, McCrady M, Rhoades D, Linscomb M, Clarahan M, Sammut S, 2015 The prevalence and correlates of depression, anxiety, and stress in a sample of college students. *J. Affect. Disord* 173, 90–96. 10.1016/j.jad.2014.10.054. [PubMed: 25462401]
- Brinker J, Cheruvu VK, 2017 Social and emotional support as a protective factor against current depression among individuals with adverse childhood experiences. *Prev. Med. Rep* 5, 127–133. 10.1016/j.pmedr.2016.11.018. [PubMed: 27981026]
- Buunk BP, Schaufeli WB, 1999 Reciprocity in interpersonal relationships: an evolutionary perspective on its importance for health and well-being. *Eur. Rev. Soc. Psychol* 10, 259–291. 10.1080/14792779943000080.
- Cella D, Gershon R, Bass M, Rothrock N, 2015 Assessment center user manual: PROMIS emotional support scoring manual.
- Cella D, Gershon R, Lai J, Choi S, 2007 The future of outcomes measurement: item banking, tailored short-forms, and computerized adaptive assessment. *Qual. Life Res* 16, 133–141. 10.1007/s11136-007-9204-6. [PubMed: 17401637]
- Cella D, Riley W, Stone A, Rothrock N, Reeve B, Yount S, Amtmann D, Bode R, Buysse D, Choi S, Cook K, Devellis R, DeWalt D, Fries J, Gershon R, Hahn E, Lai J, Pilkonis P, Revicki D, Rose M, Weinfurt K, Hays R, 2010 The Patient-Reported Outcomes Measurement Information System

(PROMIS) developed and tested its first wave of adult self-reported health outcome item banks: 2005–2008. *J. Clin. Epidemiol* 63, 1179–1194. 10.1016/j.jclinepi.2010.04.011. [PubMed: 20685078]

- Chapman DP, Whitfield CL, Felitti VJ, Dube SR, Edwards VJ, Anda RF, 2004 Adverse childhood experiences and the risk of depressive disorders in adulthood. *J. Affect. Disord* 82, 217–225. 10.1016/j.jad.2003.12.013. [PubMed: 15488250]
- Clerkin EM, Smith AR, Hames JL, 2013 The interpersonal effects of Facebook reassurance seeking. *J. Affect. Disord* 151, 525–530. 10.1016/j.jad.2013.06.038. [PubMed: 23850160]
- Costello AB, Osborne J, 2005 Best practices in exploratory factor analysis: four recommendations for getting the most from your analysis. *Pract. Assess. Res. Eval* 10.
- DeVellis RF, 2012 Scale development: theory and applications *Applied Social Research Methods Series*, 3rd ed. Sage, Thousand Oaks, CA.
- Escobar-Viera CG, Shensa A, Bowman ND, Sidani JE, Knight J, James AE, Primack BA, 2018 Passive and active social media use and depressive symptoms among United States adults. *Cyberpsychology, Behav. Soc. Netw* 21, 437–443. 10.1089/cyber.2017.0668.
- Ferguson CJ, 2009 An effect size primer: a guide for clinicians and researchers. *Prof. Psychol. Res. Pract* 40, 532–538. 10.1037/a0015808.
- Forest AL, Wood JV, 2012 When social networking is not working: individuals with low self-esteem recognize but do not reap the benefits of self-disclosure on Facebook. *Psychol. Sci* 23, 295–302. 10.1177/0956797611429709. [PubMed: 22318997]
- Frison E, Eggermont S, 2015 The impact of daily stress on adolescents' depressed mood: the role of social support seeking through Facebook. *Comput. Human Behav* 44, 315–325. 10.1016/j.chb.2014.11.070.
- GlobalWebIndex, 2017 *GWISocial: Quarterly Report on the Latest Trends in Social Networking*. London, UK.
- Gordillo V, Fekete E, Platteau T, Antoni MH, Schneiderman N, Nöstlinger C, 2009 Emotional support and gender in people living with HIV: effects on psychological well-being. *J. Behav. Med* 32, 523–531. 10.1007/s10865-009-9222-7. [PubMed: 19543823]
- Grieve R, Indian M, Witteveen K, Anne Tolan G, Marrington J, 2013 Face-to-face or Facebook: can social connectedness be derived online? *Comput. Human Behav* 29, 604–609. 10.1016/J.CHB.2012.11.017.
- Hahn EA, DeVellis RF, Bode RK, Garcia SF, Castel LD, Eisen SV, Bosworth HB, Heinemann AW, Rothrock N, Cella D, 2010 Measuring social health in the patient-reported outcomes measurement information system (PROMIS): item bank development and testing. *Qual. Life Res* 19, 1035–1044. 10.1007/s11136-010-9654-0. [PubMed: 20419503]
- Hahn EA, DeWalt DA, Bode RK, Garcia SF, DeVellis RF, Correia H, Cella D, 2014 New English and Spanish social health measures will facilitate evaluating health determinants. *Health Psychol* 33, 490–499. 10.1037/hea0000055. [PubMed: 24447188]
- Ibarra JL, Agas JM, Lee M, Pan JL, Bottenheim AM, 2018 Comparison of online survey recruitment platforms for hard-to-reach pregnant smoking populations: feasibility study. *JMIR Res. Protoc* 7, e101 10.2196/resprot.8071. [PubMed: 29661751]
- Indian M, Grieve R, 2014 When Facebook is easier than face-to-face: social support derived from Facebook in socially anxious individuals. *Pers. Individ. Dif* 59, 102–106. 10.1016/j.paid.2013.11.016.
- Kroenke K, Spitzer RL, Williams JB, 2001 The PHQ-9: validity of a brief depression severity measure. *J. Gen. Intern. Med* 16, 606–613. 10.1046/J.1525-1497.2001.016009606.X. [PubMed: 11556941]
- Langford C, Bowsher J, Maloney J, Lillis P, 1997 Social support: a conceptual analysis. *J. Adv. Nurs* 25, 95–100. 10.1046/j.1365-2648.1997.1997025095.x. [PubMed: 9004016]
- Lin LY, Sidani JE, Shensa A, Radovic A, Miller E, Colditz JB, Hoffman BH, Giles L, Primack BA, 2016 Association between social media use and depression among U.S. young adults. *Depress. Anxiety* 33, 323–331. 10.1002/da.22466. [PubMed: 26783723]
- Marino C, Gini G, Vieno A, Spada MM, 2018 The associations between problematic Facebook use, psychological distress and well-being among adolescents and young adults: a systematic review

- and meta-analysis. *J. Affect. Disord* 226, 274–281. 10.1016/j.jad.2017.10.007. [PubMed: 29024900]
- McCloskey W, Iwanicki S, Lauterbach D, Giammittorio DM, Maxwell K, 2015 Are Facebook “friends” helpful? Development of a Facebook-based measure of social support and examination of relationships among depression, quality of life, and social support. *Cyberpsychol. Behav. Soc. Netw* 18, 499–505. 10.1089/cyber.2014.0538. [PubMed: 26348809]
- Meng J, Martinez L, Holmstrom A, Chung M, Cox J, 2017 Research on social networking sites and social support from 2004 to 2015: a narrative review and directions for future research. *Cyberpsychol. Behav. Soc. Netw* 20, 44–51. 10.1089/cyber.2016.0325. [PubMed: 28002686]
- Moreno MA, Jelenchick LA, Egan KG, Cox E, Young H, Gannon KE, Becker T, 2011 Feeling bad on Facebook: depression disclosures by college students on a social networking site. *Depress. Anxiety* 28, 447–455. 10.1002/da.20805. [PubMed: 21400639]
- National Institutes of Mental Health, 2017 Major Depression [WWW Document]. URL. <https://www.nimh.nih.gov/health/statistics/major-depression.shtml> (Accessed 8.8.19).
- Nesi J, Choukas-Bradley S, Prinstein MJ, 2018 Transformation of adolescent peer relations in the social media context: part 1-A theoretical framework and application to dyadic peer relationships. *Clin. Child Fam. Psychol. Rev* 21, 267–294. 10.1007/s10567-018-0261-x. [PubMed: 29627907]
- Nick EA, Cole DA, Cho S–J, Smith DK, Carter TG, Zelkowitz RL, 2018 The Online Social Support Scale: measure development and validation. *Psychol. Assess* 30, 1127–1143. 10.1037/pas0000558. [PubMed: 29781664]
- Orben A, Dienlin T, Przybylski AK, 2019 Social media’s enduring effect on adolescent life satisfaction. In: *Proceedings of the National Academy of Sciences*, pp. 10226–10228. 10.1073/pnas.1902058116.
- Park J, Lee DS, Shablack H, Verduyn P, Deldin P, Ybarra O, Jonides J, Kross E, 2016 When perceptions defy reality: the relationships between depression and actual and perceived Facebook social support. *J. Affect. Disord* 200, 37–44. 10.1016/j.jad.2016.01.048. [PubMed: 27126138]
- Pilkington PD, Milne LC, Cairns KE, Lewis J, Whelan TA, 2015 Modifiable partner factors associated with perinatal depression and anxiety: a systematic review and meta-analysis. *J. Affect. Disord* 178, 165–180. 10.1016/j.jad.2015.02.023. [PubMed: 25837550]
- Primack BA, Bisbey MA, Shensa A, Bowman ND, Karim SA, Knight JM, Sidani JE, 2018 The association between valence of social media experiences and depressive symptoms. *Depress. Anxiety* 35, 784–794. 10.1002/da.22779. [PubMed: 29877002]
- Primack BA, Shensa A, Sidani JE, Whaite EO, Lin LY, Rosen D, Colditz JB, Radovic A, Miller E, 2017 Social media use and perceived social isolation among young adults in the U.S. *Am. J. Prev. Med* 53, 1–8. 10.1016/j.amepre.2017.01.010. [PubMed: 28279545]
- PROMIS, 2012 Domain Framework - Social health [WWW Document]. URL. <http://www.webcitation.org/6bdksQYLz> (Accessed 11.6.15).
- Reblin M, Uchino BN, 2008 Social and emotional support and its implication for health. *Curr. Opin. Psychiatry* 21, 201–205. 10.1097/YCO.0b013e3282f3ad89. [PubMed: 18332671]
- Rozzell B, Piercy C, Carr C, King S, Lane B, Tornes M, Johnson A, Wright K, 2014 Notification pending: online social support from close and nonclose relational ties via Facebook. *Comput. Human Behav* 38, 272–280. 10.1016/j.chb.2014.06.006.
- Sampasa-Kanyinga H, Lewis RF, 2015 Frequent use of social networking sites is associated with poor psychological functioning among children and adolescents. *Cyberpsychology, Behav. Soc. Netw* 18, 380–385. 10.1089/cyber.2015.0055.
- Shensa A, Sidani J, Escobar-Viera C, Chu K, Bowman N, Knight J, Primack B, 2018 Real-life closeness of social media contacts and depressive symptoms among university students. *J. Am. Coll. Heal* 66, 747–753. 10.1080/07448481.2018.1440575.
- Shensa A, Sidani JE, Lin L.y, Bowman ND, Primack BA, 2016 Social media use and perceived emotional support among US young adults. *J. Commun. Health* 41, 541–549. 10.1007/s10900-015-0128-8.
- Soler-Vila H, Kasl SV, Jones BA, 2003 Prognostic significance of psychosocial factors in African-American and white breast cancer patients: a population-based study. *Cancer* 98, 1299–1308. 10.1002/cncr.11670. [PubMed: 12973855]

- Strine TW, Chapman DP, Balluz L, Mokdad AH, 2008 Health-related quality of life and health behaviors by social and emotional support. Their relevance to psychiatry and medicine. *Soc. Psychiatry Psychiatr. Epidemiol* 43, 151–159. 10.1007/s00127-007-0277-x. [PubMed: 17962895]
- Teo AR, Chan BK, Saha S, Nicolaidis C, 2019 Frequency of social contact in-person vs. on Facebook: an examination of associations with psychiatric symptoms in military veterans. *J. Affect. Disord* 243, 375–380. 10.1016/j.jad.2018.09.043. [PubMed: 30266029]
- Umberson D, Crosnoe R, Reczek C, 2010 Social relationships and health behavior across the life course. *Annu. Rev. Sociol* 36, 139–157. 10.1146/annurev-soc-070308-120011. [PubMed: 21921974]
- Umberson D, Montez JK, 2010 Social relationships and health: a flashpoint for health policy. *J. Health Soc. Behav* 51 (Suppl), S54–S66. 10.1177/0022146510383501. [PubMed: 20943583]
- United States Department of Labor, 2017 American Time Use Survey. Washington, D.C.
- Vannucci A, Flannery KM, Ohannessian CM, 2017 Social media use and anxiety in emerging adults. *J. Affect. Disord* 207, 163–166. 10.1016/j.jad.2016.08.040. [PubMed: 27723539]
- Yao T, Zheng Q, Fan X, 2015 The impact of online social support on patients' quality of life and the moderating role of social exclusion. *J. Serv. Res* 18, 369–383. 10.1177/1094670515583271.
- Yoon S, Kleinman M, Mertz J, Brannick M, 2019 Is social network site usage related to depression? A meta-analysis of Facebook–depression relations. *J. Affect. Disord* 248, 65–72. 10.1016/j.jad.2019.01.026. [PubMed: 30711871]
- Zimet GD, Dahlem NW, Zimet SG, Farley GK, 1988 The multidimensional scale of perceived social support. *J. Pers. Assess* 52, 30–41. 10.1207/s15327752jpa5201\_2.



**Table 1**

Factor structure for emotional support items.

Complete item		Factor loading <sup>a</sup>	
		1	2
ES1	I have someone who will listen to me when I need to talk.	<b>0.915</b>	-0.008
ES2	I have someone to confide in or talk to about myself or my problems.	<b>0.925</b>	0.004
ES3	I have someone who makes me feel appreciated.	<b>0.880</b>	0.001
ES4	I have someone to talk with when I have a bad day.	<b>0.914</b>	-0.009
SMES1	I have people on SM to listen to me when I need to talk.	-0.022	<b>0.901</b>
SMES2	I have people on SM to confide in or talk about my problems or myself.	-0.044	<b>0.912</b>
SMES3	I have people on SM who make me feel appreciated.	0.084	<b>0.817</b>
SMES4	I have people on SM to talk with when I have a bad day.	-0.007	<b>0.919</b>
Cronbach's alpha		0.952	0.940
Proportion of variance explained		0.416	0.396
Correlation between rotated factors		0.069	

<sup>a</sup>Rotated factor loadings using principal factor estimation method and Promax oblique rotation.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

**Table 2**

Whole sample characteristics and bivariable associations with depression risk.

Characteristic	Whole sample <i>N</i> = 2395	Depression risk		<i>P</i> value <sup>a</sup>
		Low (75.3%)	High (24.7%)	
Median (IQR)				
ES <sup>b</sup>	4.3 (3.3–5.0)	4.5 (3.8–5.0)	3.8 (3.0–4.5)	<.001
SM-ES <sup>b</sup>	2.5 (1.5–3.5)	2.5 (1.3–3.3)	3.0 (2.0–3.8)	<.001
Hours Per Day on SM	2.3 (1.0–4.0)	2.0 (1.0–3.5)	3.0 (2.0–5.3)	<.001
ACE <sup>c</sup>	1.0 (0.0–2.0)	0.0 (0.0–1.0)	2.0 (0.0–3.0)	<.001
Age, y	27 (25–27)	28 (25–29)	27 (25–29)	<.001
Column% <sup>d</sup>				
Sex				
Male	49.0	51.0	43.2	.001
Female	51.0	49.0	56.8	
Race				
White, non-Hispanic	68.5	69.6	65.2	.23
Black, non-Hispanic	7.6	7.2	8.8	
Hispanic	14.3	13.6	16.6	
Asian	8.3	8.4	8.3	
Other <sup>e</sup>	1.3	1.4	1.2	
Education				
High school or less	13.8	11.4	21.2	<.001
Some college or technical school	30.9	28.7	37.8	
College graduate	33.5	35.5	27.3	
Graduate school	21.8	24.4	13.7	
Annual Household Income				<.001
Less than \$25,000	16.7	13.8	25.4	
\$25,000 to \$49,999	26.9	26.0	29.5	
\$50,000 to \$74,999	22.8	23.8	19.7	
\$75,000 or above	33.6	36.3	25.4	
Relationship Status				<.001
Single	43.4	41.0	50.6	
Member of unmarried couple	26.0	26.2	25.6	
Married	30.6	32.9	23.9	
Living Situation				<.001
By myself	18.3	17.4	21.1	
With parent or guardian	20.9	19.2	26.0	
With Significant other	45.9	48.5	38.0	
Other <sup>f</sup>	14.9	14.9	14.9	

<sup>a</sup>Significance determined with Chi-square tests for categorical variables and Wilcoxon rank-sum test for nonparametric continuous variables.

<sup>b</sup>Scales range from 1–5.

<sup>c</sup>Modified Adverse Childhood Experiences questionnaire ranging from 0–6.

<sup>d</sup>Column totals may not equal 100 due to rounding.

<sup>e</sup>Other includes American Indian/Native Alaskan and Native Hawaiian/Pacific Islander.

<sup>f</sup>Other includes acquaintances, friends, and roommates.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

**Table 3**

Bivariable and multivariable associations between modes of emotional support, personal and sociodemographic covariates, and depression risk.

Independent variables/covariates	Depression risk	
	OR(95% CI)	AOR(95% CI)
ES <sup>a</sup>	<b>0.56 (0.51–0.61)</b>	<b>0.57 (0.52–0.63)</b>
SM-ES <sup>a</sup>	<b>1.24 (1.15–1.34)</b>	<b>1.20 (1.09–1.32)</b>
Hours per day on SM	<b>1.16 (1.12–1.20)</b>	<b>1.10 (1.06–1.14)</b>
ACE <sup>b</sup>	<b>1.56 (1.46–1.67)</b>	<b>1.46 (1.35–1.57)</b>
Age, y	<b>0.95 (0.92–0.98)</b>	0.99 (0.95–1.03)
Sex		
Male	Reference	Reference
Female	<b>1.39 (1.15–1.68)</b>	<b>1.43 (1.14–1.79)</b>
Race		
White, non-Hispanic	Reference	Reference
Other <sup>c</sup>	<b>1.21 (1.00–1.49)</b>	0.85 (0.67–1.07)
Education		
High school or less	Reference	Reference
Some college or technical school	<b>0.72 (0.55–0.94)</b>	0.89 (0.65–1.21)
College graduate	<b>0.42 (0.31–0.55)</b>	0.82 (0.58–1.15)
Graduate school	<b>0.31 (0.22–0.43)</b>	0.71 (0.48–1.05)
Annual Household Income		
Less than \$25,000	Reference	Reference
\$25,000 to less than \$50,000	<b>0.61 (0.47–0.80)</b>	0.77 (0.56–1.06)
\$50,000 to less than \$75,000	<b>0.45 (0.33–0.60)</b>	<b>0.65 (0.46–0.91)</b>
\$75,000 or above	<b>0.38 (0.29–0.50)</b>	0.75 (0.53–1.06)
Relationship Status		
Single	Reference	Reference
Member of unmarried couple	0.80 (0.64–1.01)	1.06 (0.78–1.44)
Married	<b>0.60 (0.48–0.76)</b>	1.01 (0.68–1.49)
Living Situation		
By myself	Reference	Reference
Parent or guardian	1.09 (0.80–1.41)	1.24 (0.85–1.67)
Significant other	<b>0.65 (0.49–0.82)</b>	0.81 (0.53–1.14)
Other <sup>d</sup>	0.82 (0.59–1.12)	1.02 (0.71–1.48)

Abbreviations: OR = odds ratio; CI = confidence interval; AOR = adjusted odds ratio. AOR represents the odds for each variable, adjusting for all the other variables in the table.

<sup>a</sup> Associated odds is for each 1-unit increase on a 5-point scale.

<sup>b</sup> Modified Adverse Childhood Experiences questionnaire ranging from 0–6.

<sup>c</sup> Includes Black, non-Hispanic, Hispanic, Asian, American Indian/Native Alaskan, and Native Hawaiian/Pacific Islander.

<sup>d</sup>Other includes acquaintances, friends, and roommates.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript