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SOCIAL ENGAGEMENT EARLY IN THE U.S. COVID-19 CRISIS: EXPLORING SOCIAL SUPPORT AND PROSOCIAL BEHAVIOR BETWEEN THOSE WITH AND WITHOUT DEPRESSION OR ANXIETY IN AN ONLINE SAMPLE

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Introduction: Social distancing and sheltering-in-place mitigate the physical health risks of the novel coronavirus (COVID-19); however, there are concerns about the impact on mental health and social engagement. **Methods:** We used data from a U.S.-based online survey (March 2020) to examine patterns of social support and prosocial behavior, explore differences between people with

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and without depression or anxiety, and explore correlates of social engagement in both groups, including symptom severity in the clinical group. **Results:** The clinical group reported greater social engagement. In both groups, social engagement was positively associated with COVID-19-related worry and trait moral elevation; mindfulness was positively associated with all outcomes for the clinical group only. Social interaction frequency had little influence on outcomes. Depressive symptom severity was positively associated with all outcomes, whereas anxiety was negatively associated with prosocial behavior. **Discussion:** These findings highlight how social engagement was experienced early in the U.S. COVID-19 crisis.

Keywords: COVID-19, social engagement, social support, prosocial behavior, anxiety, depression, mental health, pandemic

INTRODUCTION

The outbreak of the novel coronavirus (COVID-19) poses significant threats to physical well-being and livelihood. Beginning in mid-March 2020, many United States (U.S.) governors issued state-wide, stay-at-home orders and advised the public to practice strict social distancing by limiting face-to-face contact with others who live outside one's home or maintaining a physical distance of at least six feet. At the time of data collection for this study, 26 states had issued stay-at-home orders (Kates, Michaud, & Tolbert, 2020). Although these types of public health interventions promote the physical safety of the population as a whole, there is growing concern that measures to protect physical health may harm mental health due to restrictions on social interactions (e.g., Brooks et al., 2020). The isolation that social distancing imposes may be particularly hazardous for those already living with elevated levels of mental health symptoms, such as depression and anxiety (Kavoor, 2020).

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As widespread social distancing necessarily limits social interaction and introduces required physical distance from others, the impact on social engagement is largely unknown. Furthermore, it is unknown whether social engagement is experienced differently among those with and without elevated depression or anxiety. The benefits of social interactions may vary based on the form they take (e.g., in-person, telephone) and their frequency, both of which are likely affected by the COVID-19 pandemic. Researchers have found face-to-face communication is associated with quality of life, social support, and connectedness, and virtual communication (e.g., text messaging, telephone calls, emails, or video calls) is also associated with positive social outcomes such as higher support, connectedness, and lower levels of reported isolation (Ahn & Shin, 2013; Lee, Leung, Lo, Xiong, & Wu, 2011; Lewandowski, Rosenberg, Parks, & Siegel, 2011). However, some results indicate virtual communication did not elicit the same levels of connectedness and face-to-face interactions were more important in eliciting social support (Ahn & Shin, 2013; Lewandowski et al., 2011). Given the differences in potential impact, it is important to examine and account for interaction types across those with and without mental health symptoms when assessing social life during this pandemic.

BENEFITS OF SOCIAL ENGAGEMENT: SOCIAL SUPPORT AND PROSOCIAL BEHAVIOR

Specific features of social engagement, such as receiving social support, giving social support, and engaging in prosocial behavior to benefit others, are important to consider because they can mitigate the psychological harm that may follow disasters, crises, and other stressful circumstances (Flores, Carnero, & Bayer, 2014). For instance, both giving and receiving social support are associated with decreased mental health symptoms (Mair, Diez Roux, & Morenoff, 2010; McGuire et al., 2018; Nurullah, 2012). Along these lines, volunteerism, a form of prosocial behavior, is associated with lower mental health symptoms, greater life satisfaction, and subjective well-being (Haski-Leventhal, 2009; Jenkinson et al., 2013). Conversely, lower levels of support are associated with greater likelihood

of experiencing or developing depressive symptoms (Santini, Koyanagi, Tyrovolas, Mason, & Haro, 2015; Teo, Choi, & Valenstein, 2013). Within some clinical populations, there is also evidence that low levels of social support are associated with more lifetime suicide attempts (You, Van Orden, & Conner, 2011). Thus, these forms of social engagement are beneficial to health and wellbeing and may serve as protective factors during times of crisis.

CORRELATES OF SOCIAL SUPPORT AND PROSOCIAL BEHAVIOR

Psychosocial protective characteristics could inform who is more likely to engage in social support and prosocial behavior. Specifically, three psychosocial protective factors that could be relevant to social engagement in the context of the current crisis are mindfulness, gratitude, and moral elevation. Mindfulness, or intentionally paying attention to the present moment without judgment (Bishop et al., 2004), promotes emotion regulation and may also relate to awareness of social engagement more broadly. For example, Pratscher Wood, King, and Bettencourt (2019) found interpersonal-specific mindfulness was associated with more empathy, perspective taking, and social connectedness. Additionally, results from a meta-analysis indicated medium-sized effects for the relation between mindfulness and prosocial behavior across gender and age ranges (Donald et al., 2019). Trait gratitude is the tendency to be aware of situations in which one is a benefactor of a positive outcome, often as a direct result of someone else's actions (McCullough, Emmons, & Tsang, 2002). Several studies have noted a positive association between gratitude and higher levels of perceived social support (Lin & Yeh, 2014; Wood, Maltby, Gillett, Linley, P& Joseph, 2008). Trait gratitude is also associated with a strong desire to pay it forward or engage in prosocial behavior (e.g., Yost-Dubrow & Dunham, 2018). Lastly, moral elevation (hereafter, elevation) is the feeling of being inspired or moved by another person's virtuous act (Algoe & Haidt, 2009). Elevation induces desires to imitate the witnessed virtuous act, become a better person, and connect with others (Aquino, McFerran, & Laven,

2011; Oliver, Hartmann, & Woolley, 2012). Although few studies have examined elevation and social support directly, several researchers have found positive associations between trait-like tendencies to experience elevation and related constructs such as compassion and responsiveness to others (Diessner, Iyer, Smith, & Haidt, 2013; Erickson & Abelson, 2012). Elevation is also positively correlated with higher levels of self-reported volunteerism and prosocial behavior (Cox, 2010; Landis et al., 2009). Overall, these psychosocial protective factors are associated with higher levels of social support and prosociality in previous studies, and therefore, should be considered when examining potential predictors of social engagement.

CURRENT STUDY

The experience of social engagement during a pandemic and subsequent drastic social distancing practices is largely unknown. Because of uncertainty related to the duration of the current crisis and the potential future threat of novel coronaviruses, it is important to identify relevant characteristics related to social engagement and explore the impact on people with mental health symptoms—a population that may be at greater risk for adverse outcomes of isolation. Therefore, the purpose of this paper is to improve our understanding of how people experienced social engagement during the early phase of the U.S. COVID-19 experience (i.e., late March, 2020) and to examine potential differences between people with high depressive and anxiety symptoms (i.e., clinical group) and those without significant symptoms (i.e., nonclinical group). To meet this objective, we assessed social engagement by measuring self-reported social support received, social support given, and the number of days engaged in prosocial behavior for COVID-19-related causes. We analyzed data from a U.S.-based, online survey conducted on March 28 and 29, 2020 to achieve three aims: (1). compare clinical and nonclinical groups on social engagement along with other relevant characteristics such as COVID-related worry, frequency of social interactions, and protective factors; (2). identify which characteristics correlate with social engagement factors in both clinical and nonclinical groups; (3). examine how depressive

and anxiety symptom severity impacts social engagement in the clinical group.

METHOD

PARTICIPANTS AND PROCEDURES

In mid-March, we were preparing an online survey study aimed to validate a newly developed questionnaire that assesses state-level experiences of moral elevation when the COVID-19 crisis emerged. We leveraged data collection by adding COVID-19-related questions to the existing survey to examine social life during this unique, early phase of the crisis. Participants were recruited through Amazon Mechanical Turk (MTurk)—an online platform that allows researchers to recruit large numbers of participants to complete tasks referred to as Human Intelligence Tasks (HITs). Eligibility for the current study included: (1). participants must be at least 18 years old and reside in the United States, (2). the number of MTurk HITs previously completed and approved must be greater than 100, and (3). participants were required to have at least a 95% approval rating for their previous HITs. These qualifications were designed to recruit participants who successfully completed substantial MTurk tasks in the past and to exclude people with a history of rejected payments due to inconsistent responses or poor effort. This study was advertised as a survey about personal experiences that was estimated to take approximately 10–15 minutes with a $1.50 payment. The average time for completion was 13 minutes, which resulted in an average hourly rate of over $6.00 per hour, which is above the median hourly wage for tasks performed on MTurk (approximately $2.00 per hour; Hara et al., 2018).

A total of 1,304 participants were recruited to participate in this study. Participants provided informed consent at the beginning of the survey, followed by a battery of self-report questionnaires. The survey included two attention screeners that assessed whether participants carefully read instructions and responded appropriately. Participants who failed both attention screeners were rejected payment and excluded from the study. To further screen for poor responding, we also excluded participants who reported inappropriate answers to count questions about how

many days the participant engaged in specific behaviors during the past week (e.g., in the past seven days, I volunteered on ten days). A total of 255 participants were excluded from this analysis: 66 did not provide consent or complete the study (i.e., did not submit their responses), 43 failed two attention screeners, 142 provided inappropriate responses to count questions, three participants were excluded for significant amounts of missing data, and one participant was excluded for being under the age of 18. Following all screening procedures, the final sample size was 1,049. All procedures were approved by the local Institutional Review Board.

MEASURES

Covariates. A demographic questionnaire was administered to assess participant characteristics including age, gender (1 = female, 0 = male)[1], race/ethnicity (recoded as 1 = minority status, 0 = white), and relationship status (recoded as 1 = in a relationship, 0 = not in a relationship). The Ten-Item Personality Inventory (TIPI; Gosling, Rentfrow, & Swann, 2003) is a 10-item measure that assessed personality traits based on the Big-Five personality dimensions. Items were rated on a 1 (disagree strongly) to 7 (agree strongly) Likert scale and summed to create five subscale scores for each personality dimension. The TIPI demonstrated adequate validity and reliability in past studies (Gosling et al., 2003). In this study, Cronbach's alpha was estimated for each dimension: extraversion ($\alpha = .70$), agreeableness ($\alpha = .45$), conscientiousness ($\alpha = .59$), emotional stability ($\alpha = .77$), and openness ($\alpha = .49$). The TIPI was included to assess the unique association of specific psychosocial protective dispositions with social engagement, above and beyond personality more broadly.

Social Engagement. To measure social support, we created four items aimed at assessing instrumental support received, emotional support received, instrumental support given, and emotional support received. These items are consistent with distinct social support factors identified in previous studies (Shakespeare-Finch & Obst, 2011). Participants were asked to

1. Two participants identified as transgender and were recoded as their currently identified gender.

rate how often they gave or received instrumental or emotional support in the past week using a 6-point scale ranging from 0 (never) to 5 (frequently). Sum scores were created for total social support received (α = .62) and total social support given (α = .66) by adding the instrumental and emotional support items for support received and support given, respectively.

To measure the frequency of three types of social interactions, participants were asked to respond to the following questions in reference to the past week: "How many days did you . . . (1). have one or more face-to-face interactions with another person who does not live with you?"; (2). have one or more virtual interactions (phone, messaging, video) with another person who does not live with you?"; or (3). volunteer your time or money to a cause related to COVID-19?." The question regarding virtual interaction was also followed by a multiple-choice question that asked which method of communication was most commonly used: text/message, phone call, social network, video chat, or other.

Mental Health Symptoms. The Patient Health Questionnaire-9 (PHQ-9; Kroenke, Spitzer, & Williams, 2001) assessed depressive symptoms over the past two weeks. Nine items were rated on a 0 (not at all) to 3 (nearly every day) scale and summed, with higher scores indicating greater symptom severity (α = .92). The PHQ-9 has demonstrated validity and reliability in past work (Kroenke et al., 2001). The Generalized Anxiety Disorder-7 (GAD-7; Spitzer, Kroenke, Williams, & Löwe, 2006) assessed anxiety symptoms over the past two weeks. Seven items were rated on a 0 (not at all) to 3 (nearly every day) scale and summed, with higher scores indicating greater symptom severity (α = .93). The GAD-7 has demonstrated adequate reliability and validity in past studies (Spitzer et al., 2006). Participants were separated into clinical and nonclinical groups based on scores from the PHQ-9 and GAD-7. Participants screened positive for the clinical group if they reported a total score of ten or higher on either measure (Levis, Benedetti, & Thombs, 2019; Spitzer et al., 2006). We also included a single item assessment of worry regarding COVID-19 by asking participants to rate their level of concern about the virus on a 5-point scale ranging from 0 (not at all) to 4 (extremely). Satisfaction with life was assessed with a single item: "In general, how satisfied are you with your life? (currently)."

Participants were instructed to respond by using a sliding scale with a range of 0 (very dissatisfied) to 100 (very satisfied).

Psychosocial Protective Factors. The Gratitude Questionnaire-6 (GQ-6; McCullough et al., 2002) assessed trait gratitude. Six items were rated on a scale from 0 (very unlike me) to 6 (very much like me) and summed, with higher scores indicating greater trait gratitude. The GQ-6 has demonstrated adequate validity and reliability in past studies (McCullough et al., 2002) and good reliability in this study (α = .86). The Freiburg Mindfulness Inventory–Short Form (FMI-SF; Walach, Buchheld, Buttenmüller, Kleinknecht, & Schmidt, 2006) assessed trait mindfulness. The 14 items were rated on a scale from 1 (rarely) to 4 (almost always) and summed, with higher scores indicating higher trait mindfulness (α = .88). The Engagement with Beauty Scale (EBS; Diessner, Solom, Frost, Parsons, & Davidson, 2008) measures tendencies to be inspired and moved by three different kinds of beauty: natural, artistic, and moral beauty. The moral beauty subscale consists of 6 items and was used to assess trait-like tendencies to experience elevation. Items are rated on a scale from 1 (very unlike me) to 7 (very much like me) and summed, with higher scores indicating higher trait elevation. The EBS has demonstrated validity and reliability in past studies (Diessner et al., 2008) and the moral beauty subscale showed good reliability in this study (α = .89).

Analytic Strategy. For the first aim, we compared the clinical and nonclinical groups using independent samples *t*-tests and calculated Cohen's *d* effect sizes for each test. We interpreted Cohen's $d < 0.20$ as minimal difference, and Cohen's *d*'s of 0.20, 0.50, and 0.80 as small, moderate, and large effects, respectively. For the second aim, we tested predictors of social support received, social support given, and prosocial behavior (i.e., days volunteered for a COVID-19-related cause) separately in both clinical and nonclinical groups, for a total of six models. Linear regression assumptions were assessed for all six models using residual plots. Visual inspection indicated linearity for all six models. Residual plots also indicated normal distribution and equal variance for models that included social support given and received as the dependent variable, but not for the two models that included days engaged in prosocial behavior

as the dependent variable. Therefore, we used multiple linear regression models to test predictors of social support given and received given that all assumptions were met. We used aggregate binomial regression to test predictors of days engaged in prosocial behavior, which modeled a series of grouped binary trials; this approach accommodates for floor and ceiling effects and handles non-normal distributions along with unequal variance (Agresti, 2015; McElreath, 2020). In all models, predictors included COVID-19-related worry, frequency of social interactions, psychosocial protective factors (e.g., mindfulness, gratitude, elevation), and covariates (e.g., demographics, personality traits). Lastly, for the third aim, we tested whether anxiety and depressive symptom severity predicted social support given, social support received, and prosocial behavior in the clinical group. Similarly, models with social support given and received as dependent variables met necessary assumptions, and therefore, were examined with multiple linear regression; whereas, the model with prosocial behavior as the dependent variable violated assumptions of normality and equal variances, and therefore, was examined with aggregate binomial regression. Given the high comorbidity between depression and anxiety in the overall population, as well as in this subsample (61%), both symptom types were entered simultaneously for each model to account for potential shared variance. All analyses were completed using R (R Core Team, 2017). We used tidyverse packages (Wickham, 2019) to process the data and produce figures. The base stats package was used to calculate *t*-tests (t.test), multiple linear regression (lm), and aggregate binomial regression (glm). Cohen's *d* was calculated with the psych package (Revelle, 2020).

RESULTS

COMPARING CLINICAL AND NONCLINICAL CHARACTERISTICS

Demographics, clinical characteristics, and descriptive measures for the total sample and clinical and nonclinical groups are presented in Table 1. Of the total 1,049 participants, 37% screened positive on either the GAD-7 or PHQ-9 and 61% of the clinical

group screened positive for both. The nonclinical group was on average four years older but otherwise was not statistically significantly different on other demographics. The clinical group reported moderately higher worry related to COVID-19. The nonclinical group reported significantly greater satisfaction with life, with a large effect size.

Regarding social interaction, the clinical group reported significantly more days with face-to-face contact and fewer days with virtual contact in the past week. Forms of virtual contact for each group are shown in Figure 1. Both groups used text or other types of written messaging the most, followed by phone call or video chat. A chi-square test indicated significantly different proportions of virtual contact between the two groups, χ^2 (4, $N = 939$) = 10.84, $p = .028$. Visual inspection suggests the nonclinical group reported a higher proportion of utilizing texts or messaging (46% versus 39%), whereas the clinical group reported a higher proportion of online social networks use (18% versus 13%); however, these differences were not significant when tested using post hoc follow-up analyses with a Bonferroni alpha correction to account for potential Type I error.

The clinical group reported moderately more days engaged in prosocial behavior for COVID-19-related causes than the nonclinical group. The clinical group also endorsed significantly higher levels of social support received and support given, with small effect sizes. In terms of protective factors, participants in the nonclinical group reported greater trait mindfulness and trait gratitude on average, with moderate to large effect sizes. There was no difference in level of trait elevation.

PREDICTORS OF SOCIAL SUPPORT RECEIVED

Table 2, Model 1 reports the multiple linear regressions testing factors associated with received social support. For the nonclinical group, gender was the only significant demographic predictor, such that women reported having received more social support in the past week. Agreeableness, COVID-19-related worry, and number of days with virtual contact were positively associated with social support received. In terms of protective factors, both levels of trait mindfulness and elevation were positively associated with social support received.

TABLE 1. Descriptive Statistics and Group Comparisons Between Nonclinical and Clinical Groups.

		Full sample	Nonclinical group	Clinical group			
		n = 1049	*n* = 665 (63%)	*n* = 384 (37%)			
Variable	**Range**	**Mean (*SD*) or *n***	**Mean (*SD*) or *n***	**Mean (*SD*) or *n***	***t* or χ^2**	***p***	**d (95% CI)**
Demographic							
Gender (female)	0–1	460 (43.9%)	298 (44.8%)	162 (42.2%)	0.58	.447	
Minority status (minority)	0–1	231 (22.0%)	135 (20.3%)	96 (25.0%)	2.86	.091	
Relationship status (in relationship)	0–1	640 (61.0%)	397 (59.7%)	243 (63.3%)	1.17	.280	
Age	18–78	38.46 (11.88)	39.93 (12.60)	35.92 (10.04)	5.66	**<.001**	0.34 (0.22, 0.47)
Personality (TIPI)							
Extraversion	2–14	7.07 (3.41)	7.33 (3.58)	6.61 (3.05)	3.47	**.001**	0.21 (0.09, 0.34)
Agreeableness	2–14	10.56 (2.65)	11.33 (2.36)	9.21 (2.58)	13.54	**<.001**	0.87 (0.73, 1.00)
Conscientiousness	2–14	11.06 (2.61)	11.92 (2.16)	9.59 (2.67)	14.55	**<.001**	0.99 (0.85, 1.12)
Emotional stability	2–14	9.88 (3.22)	11.23 (2.58)	7.53 (2.85)	20.93	**<.001**	1.38 (1.23, 1.52)
Openness to experience	2–14	9.96 (2.72)	10.34 (2.71)	9.32 (2.62)	5.91	**<.001**	0.38 (0.25, 0.51)
Satisfaction with life	0–100	65.21 (25.14)	72.55 (19.99)	52.49 (27.96)	12.35	**<.001**	0.86 (0.73, 1.00)
COVID-19 worry	0–4	2.50 (1.15)	2.23 (1.10)	2.98 (1.07)	−10.64	**<.001**	0.68 (0.55, 0.81)
Social interaction							
# Days with face-to-face contact	0–7	1.93 (1.99)	1.73 (1.89)	2.26 (2.13)	−4.03	**<.001**	0.27 (0.14, 0.40)
# Days with virtual contact	0–7	4.26 (2.43)	4.45 (2.42)	3.92 (2.40)	3.40	**.001**	0.22 (0.09, 0.34)
# Days volunteered for COVID causes	0–7	0.69 (1.47)	0.34 (0.99)	1.28 (1.90)	−9.00	**<.001**	0.68 (0.54, 0.81)

Social support							
Total social support given	0–10	5.14 (2.51)	4.91 (2.54)	5.53 (2.42)	−3.88	**<.001**	0.25 (0.12, 0.37)
Total social support received	0–10	4.20 (2.54)	3.80 (2.46)	4.89 (2.52)	−6.82	**<.001**	0.44 (0.31, 0.57)
Protective factors							
Trait mindfulness (FMI)	14–56	38.93 (7.97)	40.82 (7.70)	35.65 (7.36)	10.65	**<.001**	0.68 (0.55, 0.81)
Trait gratitude (GQ-6)	6–42	31.99 (7.51)	34.42 (6.60)	27.80 (7.12)	15.19	**<.001**	0.97 (0.84, 1.11)
Trait moral elevation (EBS)	6–42	30.45 (7.27)	30.64 (7.45)	30.12 (6.96)	1.11	.268	0.07 (-0.20, 0.05)
Number of positive clinical screens	0–2	0.59 (0.83)	0.00 (0.00)	1.61 (0.49)	−64.92	**<.001**	5.48 (5.16, 5.80)
Mental health symptoms							
Depression (PHQ-9)	0–27	6.73 (6.74)	2.48 (2.64)	14.10 (5.13)	−41.36	**<.001**	3.10 (2.89, 3.31)
Anxiety (GAD-7)	0–21	6.15 (5.76)	2.67 (2.67)	12.18 (4.56)	−37.38	**<.001**	2.74 (2.54, 2.93)

Note. Welch's *t*-test was used when Levene's test indicated unequal variances between nonclinical and clinical groups. Gender, minority status, and relationships status were compared using chi-square tests. *P*-values below .05 are in **boldface**.

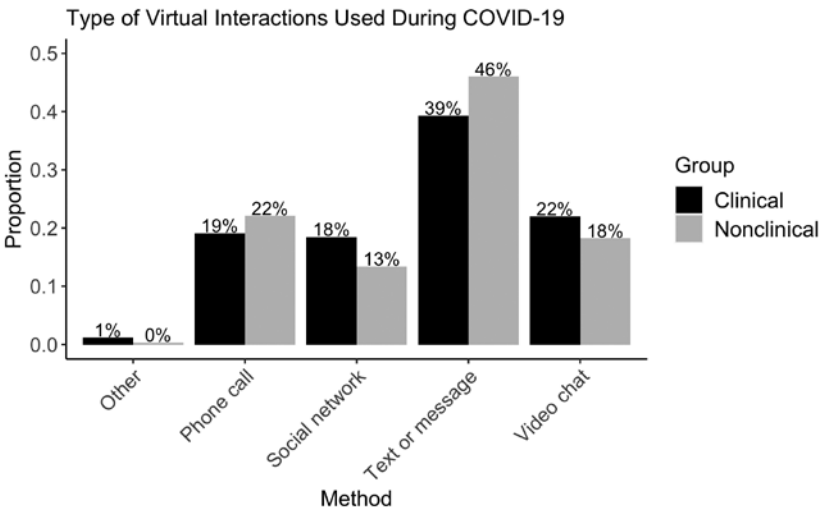

FIGURE 1. Frequency distributions for virtual interaction methods used in nonclinical and clinical groups.

For the clinical group, no demographic variables were statistically significant. Extraversion was positively associated with social support received while openness was negatively associated. Similar to the nonclinical group, COVID-19-related worry was positively associated with social support received. Neither in-person or virtual social interaction were associated with social support received. Finally, similar to the nonclinical group, both trait mindfulness and elevation were positively associated with social support received.

PREDICTORS OF SOCIAL SUPPORT GIVEN

Table 2, Model 2 reports the multiple linear regressions testing factors associated with social support given. For the nonclinical group, relationship status was the only significant demographic predictor, such that people who identified as currently being in a relationship gave more social support in the past week. Similar to social support received, agreeableness, COVID-19-related worry, and number of days with virtual contact were positively

associated with social support given. In terms of protective factors, trait elevation was positively associated with social support given.

For the clinical group, similar to social support received, extraversion was positively associated, whereas openness to experience was negatively associated with social support given. Similar to the nonclinical group, COVID-19 related worry was positively associated with social support given and no demographic variables were statistically significant. Neither in-person or virtual social interaction were associated with social support given. Finally, trait mindfulness and elevation were positively associated with social support given.

PREDICTORS OF COVID-19-RELATED PROSOCIAL BEHAVIOR

Table 3 reports the aggregate binomial models of the number of days engaged in prosocial behavior in the past week. For the nonclinical group, people who identified as currently being in a relationship reported more COVID-19-related prosocial behavior in the past week. Regarding personality, conscientiousness, emotional stability, and openness where positively associated with prosocial behavior, whereas there was a negative association with agreeableness. Similar to the other models, COVID-19-related worry was positively associated with prosocial behavior. Neither in-person or virtual social interaction frequency were associated with prosocial behavior in the past week. Finally, in terms of protective factors, trait gratitude was negatively associated with prosocial behavior, whereas there was a positive association with trait elevation. Notably, associations with gratitude were in the opposite direction of expectations.

For the clinical group, several demographic variables were associated with a higher number of days engaged in prosocial behavior in the past week including age, identifying as a racial/ethnic minority, and being single. In terms of personality factors, extraversion and emotional stability were positively associated with prosocial behavior, whereas there was a negative association with conscientiousness and openness. In contrast to the nonclinical group, there was no association between COVID-19 related worry and prosocial behavior. Number of days with face-to-face contact was positively associated with prosocial

TABLE 2. Examining the Association Between Social Support Given and Received During COVID-19 with Demographic, Personality, Social Interaction, and Protective Factors Among Nonclinical and Clinical Groups.

Variable	Nonclinical Group (n = 665)				Clinical Group (n = 384)			
Model 1: DV = Social Support Received	***B***	***SE***	***95% CI***	***p***	***B***	***SE***	***95% CI***	***p***
Intercept	3.35	0.17	3.02, 3.67	**<.001**	4.74	0.23	4.30, 5.18	**<.001**
Demographics								
Age	0.02	0.09	−0.17, 0.20	.876	−0.01	0.12	−0.24, 0.21	.906
Gender*	0.42	0.19	0.05, 0.78	**.025**	0.13	0.23	−0.33, 0.59	.571
Minority status*	0.29	0.22	−0.14, 0.73	.188	0.53	0.27	0.00, 1.05	.051
Relationship status*	0.35	0.18	−0.01, 0.70	.053	−0.06	0.24	−0.53, 0.41	.808
Personality								
Extraversion	0.10	0.10	−0.08, 0.29	.277	0.32	0.12	0.08, 0.56	**.010**
Agreeableness	0.28	0.11	0.07, 0.49	**.010**	−0.10	0.12	−0.34, 0.14	.414
Conscientiousness	−0.11	0.10	−0.30, 0.09	.288	−0.21	0.13	−0.46, 0.04	.095
Emotional stability	−0.04	0.12	−0.28, 0.20	.733	−0.11	0.14	−0.37, 0.16	.416
Openness	−0.11	0.10	−0.31, 0.09	.274	−0.38	0.12	−0.61, −0.14	**.002**
COVID-19 worry	0.45	0.09	0.27, 0.62	**<.001**	0.40	0.12	0.17, 0.63	**.001**
Social interaction								
# Days with face-to-face contact	0.04	0.09	−0.13, 0.21	.644	0.14	0.11	−0.08, 0.37	.206
# Days with virtual contact	0.35	0.09	0.17, 0.52	**<.001**	0.10	0.11	−0.12, 0.32	.375
Protective factors								
Trait mindfulness	0.33	0.12	0.09, 0.56	**.007**	0.87	0.14	0.58, 1.15	**<.001**
Trait gratitude	0.02	0.11	−0.20, 0.24	.855	−0.08	0.13	−0.34, 0.18	.553
Trait elevation	0.52	0.10	0.32, 0.72	**<.001**	0.41	0.13	0.15, 0.67	**.002**

Model 2: DV = Social Support Given	*B*	*SE*	*95% CI*	*p*	*B*	*SE*	*95% CI*	*p*
Intercept	4.39	0.16	4.07, 4.71	**<.001**	5.34	0.22	4.91, 5.77	**<.001**
Demographics								
Age	0.02	0.09	−0.16, 0.21	.799	0.02	0.11	−0.20, 0.24	.851
Gender*	0.25	0.18	−0.10, 0.61	.162	0.13	0.23	−0.31, 0.58	.555
Minority status*	0.05	0.22	−0.38, 0.47	.823	-0.05	0.26	−0.56, 0.47	.862
Relationship status*	0.66	0.18	0.31, 1.00	**<.001**	0.24	0.23	−0.21, 0.70	.294
Personality								
Extraversion	0.09	0.09	−0.09, 0.27	.341	0.31	0.12	0.08, 0.55	**.009**
Agreeableness	0.22	0.11	0.01, 0.42	**.041**	−0.03	0.12	−0.27, 0.21	.801
Conscientiousness	0.02	0.10	−0.18, 0.21	.869	−0.02	0.12	−0.26, 0.22	.867
Emotional stability	0.00	0.12	−0.23, 0.23	.981	−0.08	0.13	−0.33, 0.18	.565
Openness	0.09	0.10	−0.10, 0.28	.358	−0.41	0.12	−0.64, −0.19	**<.001**
COVID-19 worry	0.48	0.09	0.30, 0.65	**<.001**	0.48	0.12	0.26, 0.71	**<.001**
Social interaction								
# Days with face-to-face contact	0.12	0.09	−0.05, 0.28	.175	0.20	0.11	−0.02, 0.41	.076
# Days with virtual contact	0.47	0.09	0.30, 0.64	**<.001**	0.12	0.11	−0.10, 0.34	.274
Protective factors								
Trait mindfulness	0.18	0.12	−0.05, 0.41	.131	0.45	0.14	0.17, 0.72	**.001**
Trait gratitude	0.03	0.11	−0.18, 0.25	.770	0.22	0.13	−0.04, 0.47	.094
Trait elevation	0.68	0.10	0.49, 0.88	**<.001**	0.54	0.13	0.28, 0.79	**<.001**

Note. *Gender was coded as 0 = male, 1 = female; Minority was coded as 0 = White, 1 = minority; Relationship status was coded as 0 = not currently in a relationship, 1 = in a relationship. All variables (predictors) were simultaneously entered in one model for social support received, and in a separate model for social support given. Separate models were run for each group, resulting in a total of four models. All continuous variables were standardized before they were added as a predictor. Dichotomous variables (gender, minority, and relationship status) were not standardized.

TABLE 3. Examining the Association Between Number of Days Engaged in Prosocial Behavior for Covid-19 Causes with Demographic, Personality, Social Interaction, and Protective Factors Among Nonclinical And Clinical Groups (Aggregated Binomial Regression).

Variable	Nonclinical Group (n = 665)				Clinical Group (n = 384)			
Model 3: DV = # of Days Engaged in Prosocial Behavior	***B***	***SE***	***95% CI***	***p***	***B***	***SE***	***95% CI***	***p***
Intercept	−3.73	0.16	−4.06, −3.43	**<.001**	−2.19	0.12	−2.43, −1.95	**<.001**
Demographics								
Age	−0.14	0.08	−0.30, 0.02	.092	0.13	0.06	0.01, 0.24	**.036**
Gender*	0.28	0.15	−0.02, 0.57	.067	−0.06	0.12	−0.29, 0.17	.615
Minority status*	−0.04	0.17	−0.39, 0.29	.802	0.34	0.12	0.09, 0.58	**.006**
Relationship status*	0.40	0.16	0.10, 0.71	**.010**	−0.25	0.12	−0.49, −0.02	**.036**
Personality								
Extraversion	0.10	0.08	−0.06, 0.26	.205	0.40	0.07	0.25, 0.54	**<.001**
Agreeableness	−0.19	0.09	−0.36, −0.02	**.028**	−0.05	0.07	−0.19, 0.09	.460
Conscientiousness	0.23	0.10	0.04, 0.42	**.021**	−0.18	0.07	−0.32, −0.03	**.016**
Emotional stability	0.23	0.11	0.02, 0.45	**.032**	0.22	0.08	0.06, 0.38	**.006**
Openness	0.19	0.09	0.01, 0.37	**.038**	−0.16	0.07	−0.3, −0.03	**.021**
COVID-19 worry	0.58	0.08	0.43, 0.74	**<.001**	0.06	0.06	−0.07, 0.18	.380
Social interaction								
# Days with face-to-face contact	0.13	0.07	−0.01, 0.26	.059	0.44	0.06	0.33, 0.55	**<.001**
# Days with virtual contact	−0.02	0.08	−0.17, 0.14	.837	0.00	0.06	−0.13, 0.12	.950
Protective factors								
Trait mindfulness	−0.08	0.10	−0.28, 0.12	**.412**	0.58	0.08	0.42, 0.73	**<.001**
Trait gratitude	−0.27	0.09	−0.45, −0.08	**.004**	−0.48	0.08	−0.65, −0.32	**<.001**
Trait elevation	0.37	0.10	0.18, 0.57	**<.001**	0.25	0.08	0.09, 0.41	**.002**

Note. *Gender was coded as 0 = male, 1 = female; Minority was coded as 0 = white, 1 = minority; Relationship status was coded as 0 = not currently in a relationship, 1 = in a relationship. Using aggregate binomial regression, separate models were run for each group, resulting in a total of two models. All continuous variables were standardized before they were added as a predictor. Dichotomous variables (gender, minority, and relationship status) were not standardized. Results are reported in the inverse logit metric.

behavior. Finally, all of the protective factors were associated with prosocial behavior. Trait mindfulness and elevation were positively associated with prosocial behavior, whereas there was a negative association with trait gratitude. Similar to the nonclinical group, associations with gratitude were in the opposite direction of expectations.

Given the unexpected results for trait gratitude and days engaged in prosocial behavior, we conducted follow-up analyses with models that included gratitude as the only predictor to examine whether this finding was the result of a suppression effect or confound related to other predictors in the original model. Results for the clinical group were in the same direction and statistically significant ($B = -0.10$, $SE = 0.05$, 95% CI: −0.20, 0.00, $p = .045$); however, the effect was much smaller than the original model ($B = -0.48$) and confidence intervals suggest this finding is bordering a zero effect. Results from the nonclinical group were not significant when the model only included trait gratitude ($B = 0.01$, $SE = 0.07$, 95% CI: −0.12, 0.15, $p = .902$). These results should be considered when interpreting correlates of trait gratitude in this study.

DEPRESSION AND ANXIETY SYMPTOMS AS PREDICTORS OF SOCIAL ENGAGEMENT

Results for analyses that examined mental health symptom severity as predictors for three separate outcomes among the clinical group are presented in Figure 2. Depression was positively associated with social support received ($B = 0.56$, $SE = 0.13$, 95% CI: [0.30, 0.82], $p < .001$), whereas anxiety was not significantly associated with support received ($B = 0.09$ $SE = 0.13$, 95% CI: [−0.18, 0.35], $p = .522$). Similarly, depression was positively associated with social support given ($B = 0.28$, $SE = 0.13$, 95% CI: [0.03, 0.53], $p = .031$) and the association with anxiety was nonsignificant ($B = 0.25$ $SE = 0.13$, 95% CI: [−0.01, 0.50], $p = .059$). In terms of number of days engaged in prosocial behavior, depression was positively associated with prosocial behavior ($B = 0.66$, $SE = 0.06$, 95% CI: [0.53, 0.78], $p < .001$), whereas there was a negative association with anxiety ($B = -0.24$ $SE = 0.06$, 95% CI: [−0.36, −0.13], $p < .001$).

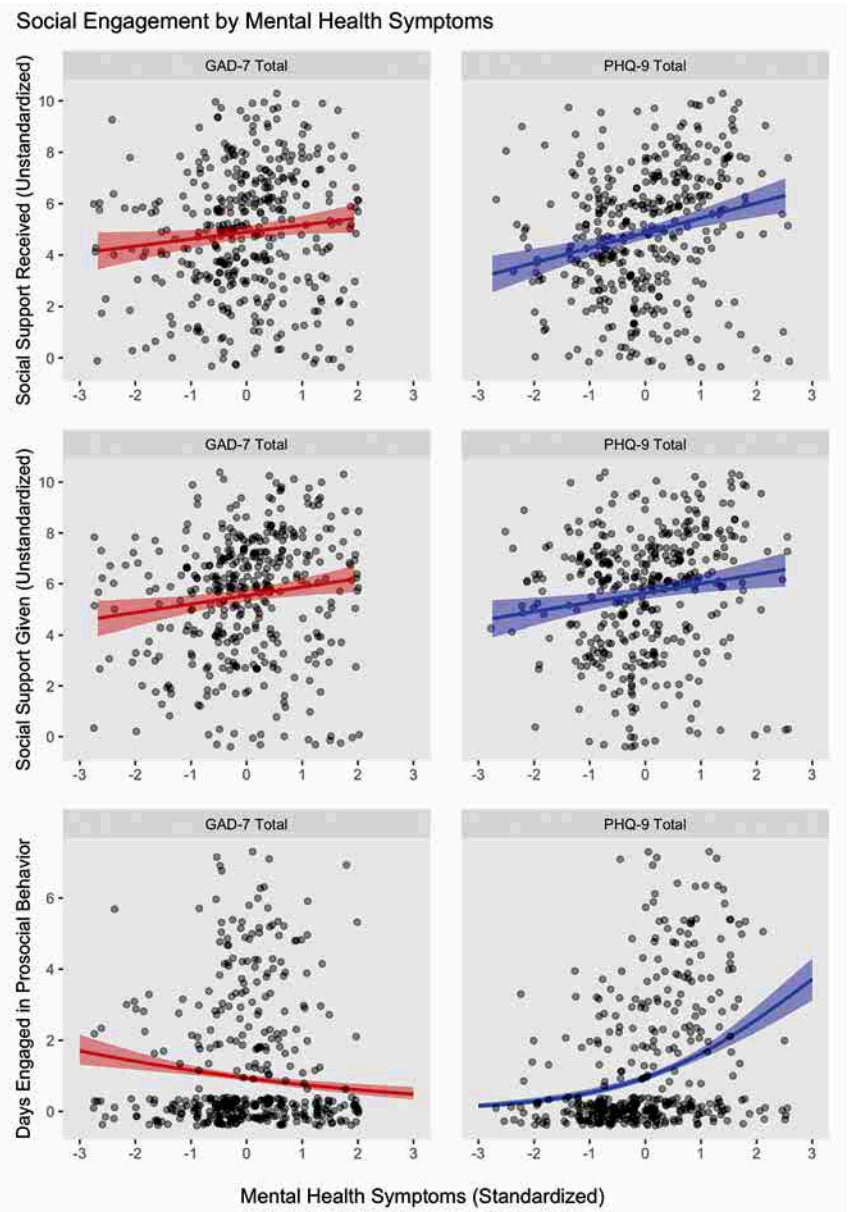

FIGURE 2. Scatterplot of standardized mental health symptoms across social support received, support given, and days engaged in prosocial behavior. Lines represent coefficients for each predictor without any covariates; alternative models with covariates did reduce the effect size, but not statistical significance of depressive and anxiety symptoms. Data for each plot was mildly jittered to reduce overplotting issues.

DISCUSSION

The purpose of this study was to examine how people experienced social engagement during the early phase of COVID-19 and to expand our understanding of how people might differ in those experiences based on whether they reported significant depressive and/or anxiety symptoms. The clinical and nonclinical groups differed in terms of participant characteristics and those characteristics were differentially related to social support received, social support given, and prosocial behavior across the two groups. Lastly, follow-up analyses within the clinical group indicated depression and anxiety symptoms are differentially related to social engagement outcomes. Results from this cross-sectional study cannot offer insight into the causal relationships or the directionality of associations; however, these exploratory analyses suggest important differences between clinical and nonclinical groups that could inform future work aimed to ensure or enhance social engagement in the context of the COVID-19 crisis.

COMPARING CLINICAL AND NONCLINICAL CHARACTERISTICS

Observed differences among the predictors, with the exception of elevation, were consistent with what would be expected when comparing a group with psychological distress to another group without significant distress. Namely, desirable or protective characteristics—such as satisfaction with life, gratitude, and mindfulness—were higher in the nonclinical group, whereas adverse characteristics like mental health symptoms and worry about COVID-19 were higher in the clinical group. On the other hand, observed differences regarding the constructs of social engagement suggest that people who endorse clinical symptoms experience social engagement differently during the crisis than those without symptoms. The direction of these differences was somewhat unexpected because the clinical group reported higher levels of social support received, support given, prosocial behavior, and more in-person social interactions compared to the nonclinical group. The one exception is that people

in the nonclinical group reported more days of virtual social interactions.

Due to the nonexperimental nature of this study and the small magnitude of observed effects, it is unclear whether these findings suggest meaningful implications about how each group is engaging in social behaviors despite social distancing practices, or possible mental health consequences of certain social behaviors. For example, one possible interpretation is that this clinical population has a tendency to engage with more in-person and less virtual interactions. An alternative explanation is that the people who report more face-to-face interactions are at risk for developing higher levels of depression and anxiety because of the stress associated with being in public during the pandemic (e.g., fear of being infected or infecting others); thus, highlighting the need for further investigation.

Higher levels of social support received in the clinical group could be a function of a greater need for social support to cope with depression or anxiety and may be considered encouraging given concerns that clinical populations might experience adverse outcomes due to increased isolation. Despite reporting higher received support, the clinical group still endorsed elevated levels of psychological distress and lower life satisfaction; therefore, further work is needed to determine how received support could be leveraged to alleviate mental health symptoms or assist with distress associated with social distancing. Notably, the measure of social support in this study emphasizes frequency of support received, and therefore, future studies should also aim to assess the quality of the support to fully understand its potential effects.

Interestingly, the clinical group also reported higher levels of social support given and past week prosocial behavior. This finding is somewhat unexpected given that some studies have found a negative association between the presence of psychological distress and prosocial behavior (e.g., Isaacs et al., 2017). Given the benefits of prosocial behavior and social support provision (Jenkinson et al., 2013; Nurullah, 2012), future work should investigate the mechanisms of these factors in the clinical population and test whether these processes can be utilized to alleviate mental health symptoms or enhance well-being. Also, it should be noted that among the social engagement outcome variables of interest, the magnitude of differences between clinical

and nonclinical groups were largest in prosocial behavior. The group difference in providing social support was also larger than receiving support; thus, variables, that involve helping others, appear to be more meaningfully different and warrant further investigation.

PREDICTORS OF SOCIAL ENGAGEMENT ACROSS CLINICAL AND NONCLINICAL GROUPS

Results from regression-based models that examined predictors of social support and prosocial behavior indicate there are similarities and differences regarding significant predictors across clinical and nonclinical groups. First, there are similarities that pertain to COVID-19 related worry and trait elevation. In general, higher COVID-19 worry was positively associated with social support received and given in both groups, and positively associated with prosocial behavior for the nonclinical group. These findings reflect a similar pattern from the initial group comparisons in that people who report higher levels of distress—in this case, COVID-19 worry—report higher social support and prosociality. As previously mentioned, perhaps higher social support received is correlated with worry because worried individuals are in greater need of support in the first place. Future work should test this directly, in addition to examining the positive association of worry with support given and prosocial behavior. Furthermore, future studies should consider assessing for constructs like empathy or utilization of active coping strategies as potential mechanisms that might elaborate on these findings.

Another similarity across both groups is that higher trait elevation—a greater tendency to be moved or touched by others' virtuous behavior—was significantly associated with higher social support received, support given, and prosocial behavior above and beyond the effects of other covariates. It should be noted that elevation was the largest predictor in models predicting social support given, and the associations for elevation were strongest for support given versus support received and prosocial behavior.

Although few elevation studies have examined social support directly, these results are consistent with findings from a study that suggested higher elevation was significantly associated with

perceived compassion from and toward others in the aftermath of a traumatic event (i.e., campus shooting; Tingey, McGuire, Stebbins, & Erickson, 2019). More broadly, these results are also consistent with past work that highlights the relationship between experiencing elevation and a strong desire to help and connect with others (Cox, 2010; Erickson et al., 2018; Van de Vyver & Abrams, 2015). Perhaps people who are more predisposed to experience elevation are feeling inspired by the many remarkable acts of virtue that have emerged during this crisis (e.g., self-sacrifice by health professionals) and subsequently experience some of the social benefits associated with that emotion. Given these preliminary findings and considering that social engagement is a theorized consequence of experiencing elevation, researchers who are looking for innovative ways to facilitate engagement in the midst of this crisis should explore the potential utility of elevation. Further research into this area may be particularly important given that the relation between elevation and social engagement outcomes was consistent for both clinical and nonclinical groups; therefore, it might be a universal protective factor.

One last similarity between groups was the negative association between trait gratitude and prosocial behavior in both groups. This result was unexpected and not consistent with the gratitude literature that often shows a protective effect of gratitude on well-being. We conducted follow-up analyses that indicated zero to minimal effects when testing models that did not include additional predictors. We believe the original significant findings are likely an artifact of the models, and these results should be interpreted with caution.

There were key differences in the significance of predictors between the two groups, including frequency of social interactions and trait mindfulness. The number of days with face-to-face contact was only significant for prosocial behavior within the clinical group. Further research is needed to determine directionality of this relationship, but it could be the case that more prosocial behavior is typically associated with more face-to-face contact. Alternatively, it could be that more face-to-face contact motivated people to give to a COVID-19-related cause because those people experienced more exposure to tragedy and witnessed the need for volunteerism firsthand. This finding might

be absent in the nonclinical group because of floor effects in that sample (i.e., many reported zero days of engaging in prosocial behavior in the past week).

Contrary to the results for face-to-face contact, days of virtual contact was only positively associated with social support received and support given for the nonclinical group. These initial findings could support the viability of virtual interactions to facilitate or maintain social support during this crisis. The group differences in these results could also highlight that virtual interaction is perhaps more relevant for social support in nonclinical groups than it is for clinical groups. Our results suggest the frequency of face-to-face and virtual interactions were not associated with social support, but face-to-face interactions were associated with prosocial behavior in the clinical group. Future studies should aim to investigate this difference and explore potential mechanisms for effective social support in clinical samples. For example, maybe the frequency of support (as measured in this study) is less important than the quality for those with significant depression or anxiety, which could have implications for public health efforts aimed at addressing problems associated with isolation and the need for effective social support.

Last, trait mindfulness was a significant predictor for all outcome variables within the clinical group, but it was only positively associated with social support received in the nonclinical group, despite the nonclinical group reporting moderately higher levels of trait mindfulness in comparison (see Table 1). Taken together, this discrepancy suggests trait mindfulness is more closely related to social support and prosocial behavior in the clinical group. If mindfulness is in fact highly relevant to social engagement in this population, it could point to the potential utility of implementing mindfulness-based interventions for people with significant depressive or anxiety symptoms.

DEPRESSIVE AND ANXIETY SYMPTOMS AND SOCIAL ENGAGEMENT

The final set of analyses indicated that depressive symptoms were positively associated with all three outcome variables in the clinical group. After accounting for the effects of depressive

symptoms, higher anxiety symptoms were negatively associated with prosocial behavior, whereas the effects for social support received and support given were nonsignificant. These results suggest people with higher levels of generalized worry may be less likely to engage in prosocial behavior. Although this finding does not indicate causality, it is plausible that higher anxiety overall could be associated with hesitancy to engage in outreach activities.

These results suggest depressive symptoms account for a greater portion of variance explained in social engagement variables in this study. Given previous studies that highlight an inverse relationship between psychological distress and prosocial behavior (e.g., Isaacs et al., 2017), the findings for depressive symptoms in this study are somewhat unexpected; however, select studies offer support for these findings. For example, researchers who conducted a multi-wave study with older adults found formal volunteering led to lower depressive symptoms in the future, as expected, but they also found depression was associated with more volunteering behavior in the future (Li & Ferraro, 2005). Because the present study specifically measured the number of days participants engaged in prosocial behavior for a cause related to COVID-19, perhaps this is also a distinct form of prosociality (i.e., providing aid to an active crisis) that functions differently than generic prosocial behavior. Regardless, these results suggest people in the clinical group with higher depressive symptoms were more likely to engage in some form of prosocial behavior during this crisis. Future research would benefit from identifying the ways in which people tried to contribute given the unique circumstances and restrictions to typical social engagement, as well as the potential long-term effects of prosocial behavior in the context of social distancing.

LIMITATIONS

Results should be interpreted in light of study limitations. First, an existing survey was leveraged to study COVID-19-related variables in addition to planned analyses. Because of this, some relevant COVID-19-related health factors were not assessed, such as COVID-19 infection status, presence of COVID-19 in

participant's social network, and COVID-19-related impact on social and occupational functioning. These additional COVID-19-related questions were not included due to concern about participant burden. Second, this study is cross-sectional, so the directionality of these associations is unknown. Third, we examined a limited number of mental health symptoms. Although depression and anxiety are among the most common mental health conditions that impact social functioning, some individuals' social functioning may be impacted by other disorders. Fourth, the type of face-to-face social interactions was not assessed; relevant to the COVID-19 context, it is unclear whether these face-to-face interactions were occurring in a medical or occupational setting versus a recreational setting. Fifth, the valence of social interactions was not assessed and so the quality or supportiveness of the social engagement is unknown. Sixth, we had low composite reliability coefficients for several of the constructs (e.g., the Big 5 dimensions), which limits the integrity of their contribution to the models.

Nevertheless, the current study offers novel data on social life during the early days of the U.S. COVID-19 pandemic, including insight into social engagement by Americans who experienced depression or anxiety during this time. It is our hope that these results spur further investigation to how we can continue enacting the public health policies that are needed to keep people safe and alive, while also facilitating and maintaining social engagement.

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