



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



Original article

Adolescents' Motivations to Engage in Social Distancing During the COVID-19 Pandemic: Associations With Mental and Social Health


 Benjamin Oosterhoff, Ph.D.^{a,*}, Cara A. Palmer, Ph.D.^a, Jenna Wilson, M.S.^b, and Natalie Shook, Ph.D.^c
^a Department of Psychology, Montana State University, Bozeman, Montana^b Department of Psychology, West Virginia University, Morgantown, West Virginia^c School of Nursing, University of Connecticut, Storrs, Connecticut

Article history: Received April 5, 2020; Accepted May 1, 2020

Keywords: COVID-19; Social distancing; Motivation; Depression; Anxiety; Belongingness; Burdensomeness

 A B S T R A C T

Purpose: Reducing the spread of infection during the COVID-19 pandemic prompted recommendations for individuals to socially distance. Little is known about the extent to which youth are socially distancing, what motivations underlie their social distancing, and how these motivations are connected with amount of social distancing, mental health, and social health. Using a large sample of adolescents from across the United States, this study examined adolescents' motivations for social distancing, their engagement in social distancing, and their mental and social health.

Methods: Data were collected on March 29th and 30th, 2020, two weeks after COVID-19 was declared a national emergency in the United States. The sample consisted of 683 adolescents recruited using social media. A series of multiple linear regressions examined unique associations among adolescents' motivations to engage in social distancing, perceived amount of social distancing, anxiety symptoms, depressive symptoms, burdensomeness, and belongingness.

Results: Almost all respondents (98.1%) reported engaging in at least a little social distancing. The most commonly reported motivations for social distancing concerned social responsibility and not wanting others to get sick. Motivations concerning state or city lockdowns, parental rules, and social responsibility were associated with greater social distancing, whereas motivations concerning no alternatives were associated with less social distancing. Specific motivations for social distancing were differentially associated with adolescents' anxiety symptoms, depressive symptoms, burdensomeness, and belongingness.

Conclusions: Understanding adolescents' motivations to engage in social distancing may inform strategies to increase social distancing engagement, reduce pathogen transmission, and identify individual differences in mental and social health during the COVID-19 pandemic.

© 2020 Society for Adolescent Health and Medicine. All rights reserved.

 IMPLICATIONS AND CONTRIBUTIONS

Using a large sample of US adolescents recruited during the COVID-19 pandemic, this study found associations among social distancing motivations, degree of social distancing, and mental and social health. Findings hold promise for local governments and parents to understand sources of variation in adolescents' social distancing and mental and social health.

 On March 11, 2020, the World Health Organization (WHO) declared the novel corona virus disease (COVID-19) outbreak a
Conflicts of interest: The authors have no conflicts of interest to disclose.

* Address correspondence to: Benjamin Oosterhoff, Ph.D., Department of Psychology, Montana State University, P.O. Box 173440, Bozeman, MT 59717-3440.

E-mail address: Benjamin.oosterhoff@montana.edu (B. Oosterhoff).

pandemic [1], and on March 13th, 2020, the United States declared COVID-19 a national emergency [2]. The COVID-19 pandemic originated in Wuhan, Hubei Province, China, and has since spread globally, with over 970,000 confirmed cases worldwide as of April 3 and over 210,000 confirmed cases in the United States [3]. To reduce the spread of the virus and lower the risk of overwhelming health systems around the world, one

major recommendation from health organizations was to implement social distancing procedures, which involves minimizing social and physical contact between people [1]. Measures to promote social distancing include limiting the size of gatherings, maintaining at least 6 feet of distance between people, closure of nonessential businesses, teleworking, distance learning, and shelter-in-place orders. Past research suggests variability in the rate at which teenagers engaged in social distancing in the week after COVID-19 being declared a US national emergency [4]. Less is known about youths' motivations to engage in social distancing and how these motivations are connected with their social distancing behavior and their mental and social health.

Youths' motivations or reasons to engage in social distancing may be connected with their social distancing engagement, mental health, and social health. According to the Self-Determination Theory [5], motivations vary in the degree to which they are controlled (e.g., rule-based) versus autonomous (e.g., volition-based; [5]). Autonomous motivations more strongly predict engagement in prosocial behavior than controlled motivations [6] and have been connected with greater mental health benefits [7]. Furthermore, prosocial motivations, including concern for the welfare of others, have also been linked with greater prosocial action [8] and psychological well-being [9]. In the context of social distancing, youth may endorse motives connected with personal autonomy (e.g., not wanting to get personally sick), prosocial action (e.g., not wanting to get others sick), or control (e.g., parental rules, city/state lockdown). Youth motivated by autonomous or prosocial reasons may engage in more social distancing relative to those who are not motivated by these reasons. Furthermore, autonomous and prosocial motivations may be connected with greater mental health among youth who are social distancing.

Understanding the connection among social distancing motivations, mental health, and social health may be especially important for adolescents, who are potentially at risk for negative psychological effects from COVID-19 social distancing. Adolescence is a period associated with increased risk for the development of many psychiatric disorders, such as anxiety and depression [10]. In addition, a number of hormonal and neurobiological changes during adolescence correspond with heightened emotional reactivity and the ongoing development of coping strategies and stress regulation [11,12]. Simultaneously, adolescence is marked by the increased importance of peer relationships and a greater reliance on peers for social support [13,14]. Peer interactions help contribute to adolescents' social health by enhancing their sense of belonging and reducing a sense of burdensomeness on others, both of which are considered crucial interpersonal needs [15]. Examining connections between social distancing motivations and mental and social health among youth may provide important insight into potential avenues for reducing the psychological consequences of social distancing among this at-risk population.

The Present Study

The present study had three aims. The first aim was to identify youths' motivations for social distancing. We expected youth to endorse a wide variety of social distancing motivations, including those reflecting personal desires or autonomy (e.g., not wanting

to personally get sick), prosocial action (e.g., not wanting others to get sick), and control (e.g., parental or state rules). The second aim was to determine the extent to which different motivations were related to the degree of social distancing. We expected that youth who endorsed autonomy and prosocial motives would engage in social distancing to a greater extent relative to those who did not endorse these motives. The third aim was to examine connections between social distancing motivations and adolescents' mental health and social health. We expected that youth who endorsed autonomous or prosocial motives would report better mental and social health. Past research has found consistent demographic differences in adolescents' mental health, with adolescent girls, minority youth, older youth, and those from lower socioeconomic backgrounds having greater anxiety and depressive symptoms [16]. Thus, the present study accounted for these demographic differences to isolate links between social distancing motivations and mental and social health.

Method

Participants and procedure

Participants were 683 adolescents residing in the United States and between the ages of 13 and 18 years (mean = 16.35, standard deviation = 1.13). A minimum sample size of 600 was determined based on past research on motivation in teens, and we oversampled to account for potential publication bias [6,17]. The sample was primarily 10th (19.7%), 11th (30.6%), or 12th (31.5%) graders with fewer ninth (13.2%) graders and college students (4.0%). The sample was composed of primarily female participants (75.3%) with 22.7% male participants and 4.9% identifying as nonbinary. The sample was primarily white/Caucasian (77.0%), followed by Hispanic/Latino (15.5%), African American/Black (5.6%), Asian American/Pacific Islander (11.1%), American Indian/Alaskan Native (3.2%), or other (2.9%). As a proxy for family financial strain [18], youth were asked whether their families had enough money to buy almost anything they wanted (7.7%), no problem buying the things they need and can also sometimes buy special things (53.6%), just enough money for the things they need (31.5%), or a hard time buying the things they need (7.2%). All youth reported that their school had been temporarily closed to facilitate social distancing at the time of data collection. A total of 13 youths (1.9%) were missing data on social distancing engagement and motivation and were removed from the sample.

This study was advertised on various social media platforms (Facebook, Instagram, Twitter, Reddit), and participants self-selected into the study to complete a 10-minute survey. Youth who saw the advertisement, selected into the study, and provided consent were enrolled in the study. Data were collected from 8:00 P.M. on March 29th through 9:00 P.M. on March 30th, 2020. This study involved no more than minimal risk, and thus, a waiver of parental permission was granted. Upon selecting into the study, participants were given a link to a letter explaining the study and asked to provide this letter to their parents to inform them of their participation in the study. All youth who provided informed written consent by selecting that they agree to participate in the research described on the consent form were invited to take the survey. Those who completed the survey were

entered into a drawing for a \$50 Amazon gift card. This study protocol was approved by the institutional review board at the first author's institution.

Social distancing and motivation

A single item created for the purpose of this study was used to capture the extent to which youth perceived that they were engaging in social distancing. This perception-based assessment of social distancing was used given the lack of validated measures of social distancing, the large degree of heterogeneity in how youth could exercise social distancing, and the relevance of perceived social isolation compared with objective social isolation for mental health [19]. Participants were asked "In the past 7 days, to what extent did you engage in social distancing?" Response options were given on a 5-point scale including 1 (*not at all*), 2 (*a little*), 3 (*somewhat*), 4 (*a lot*), and 5 (*a great deal*), with an option to indicate that they did not know what social distancing was. If participants reported engaging in "a little" to "a great deal" of social distancing, they were presented with a list of motivations for social distancing, which was created based on remote online discussion with a small focus group of teens ($n = 3$). A total of 10 motivations were presented (Table 1). Participants were able to select all motivations that applied to them, and an "other" option was provided along with an open-ended text box for teens to provide more information. A small percentage of teens selected "other" ($n = 29$, 4.4%), and a review of these qualitative responses indicated that each response qualified as one of the other already provided categories, suggesting that most teens' motivations were captured.

Anxiety symptoms

Anxiety symptoms were assessed using the short fixed-form 8-item Patient-Reported Outcomes Measurement Information System anxiety scale ($\alpha = .94$; [20]). Youth rated their agreement with items (e.g., "In the past 7 days, I felt nervous.") on a 5-point scale from 1 (*never*) to 5 (*almost always*). Mean scores were calculated, with higher values indicating greater anxiety symptoms.

Depressive symptoms

Depressive symptoms were assessed using the short fixed-form 8-item Patient-Reported Outcomes Measurement Information System depression scale ($\alpha = .95$; [20]). Youth rated their agreement with items (e.g., "In the past 7 days, I felt sad.") on a 5-

point scale from 1 (*never*) to 5 (*almost always*). Mean scores were calculated, with higher values indicating greater depressive symptoms.

Belongingness

Belongingness was measured with 3 items ($\alpha = .82$) adapted from the Interpersonal Needs Questionnaire [15]. Participants rated the extent to which they belong, other people care about them, and they felt like they have many caring and supportive friends on a 7-point scale from 1 (*not at all*) to 7 (*extremely*). Mean scores were calculated, with higher values indicating greater feelings of belongingness.

Burdensomeness

Burdensomeness was measured with 2 items ($r = .71$) adapted from the Interpersonal Needs Questionnaire [15]. Participants rated the extent to which they currently felt like a burden on society and make things worse for the people in their life on a 7-point scale from 1 (*not at all*) to 7 (*extremely*). Mean scores were calculated, with higher values indicating greater feelings of burdensomeness.

Demographic characteristics

Participants reported their age, gender, race, financial strain, and parents' education. Financial strain and parents' education were included as independent markers of socioeconomic status. Financial strain was measured by asking youth "What best describes your family's financial situation?" with nominal responses including (1) *we have a hard time buying the things we need*; (2) *we have just enough money for the things we need*; (3) *we have no problem buying the things we need, and we can also sometimes buy special things*; and (4) *we have enough money to buy almost anything we want*. Highest level of mothers' and fathers' education were reported with separate items on a 3-point scale including 1 (*high school or less*), 2 (*some college*), and 3 (*college graduate or more*), with the option of indicating "I do not know", and were combined into one index representing 1 (*neither parent attended college*), 2 (*at least one parent completed some college*), and 3 (*at least one parent completed college*).

Analytic technique

Multiple regressions were used to test the primary study hypotheses. For these analyses, adolescents' social distancing, anxiety symptoms, depressive symptoms, burdensomeness, and belongingness were specified as the dependent variables and motivations to engage in social distancing were specified as the primary independent variables. All models included adolescent gender, age, race, ethnicity, and socioeconomic status (family financial strain and parents' education) as covariates, and models predicting mental or social health included social distancing as a covariate. Models were estimated using the `lm` function in the R statistical program. Low levels of missing data (<6.5%) were estimated using multiple imputation.

Results

Means, standard deviations, and bivariate correlations among study variables are presented in Table S1 (supplemental file).

Table 1

Adolescents' motivations to engage in social distancing

Label	Motivation	N	%
Social responsibility	It is socially responsible	513	78.1
Avoid others sick	I do not want others to get sick	512	77.9
Lockdown	My state/city is on lockdown	400	60.9
Avoid personal sick	I do not want to personally get sick	380	57.8
Parents' rules	My parents are making me	358	54.5
Prefer stay home	I prefer to stay at home anyway	140	21.3
No alternatives	There is nothing else going on	117	17.8
Friends said I should	My friends told me I should	91	13.9
Avoid judgment	I do not want to be socially judged	46	7.0
Other	Other	29	4.4

Total N = 657. Adolescents could select multiple motivations.

Table 2
Associations among adolescents' social distancing, motivations, mental health, and social health

	Social distancing			Anxiety symptoms			Depressive symptoms			Burdensomeness			Belongingness		
	Estimates	SE	95% CI	Estimates	SE	95% CI	Estimates	SE	95% CI	Estimates	SE	95% CI	Estimates	SE	95% CI
Age	.02	.03	-.04, .07	.02	.04	-.06, .09	.00	.04	-.07, .08	-.05	.06	-.16, .07	.03	.05	-.07, .13
Gender: female	.09	.08	-.07, .25	.48	.11	.27, .70	.38	.11	.17, .60	.27	.17	-.06, .60	-.23	.15	-.53, .06
Race: white	-.21	.08	-.36, -.05	.11	.11	-.10, .32	.11	.10	-.10, .31	.27	.16	-.31, .34	-.05	.15	-.34, .24
Hispanic	-.21	.09	-.39, -.02	.12	.12	-.13, .36	.22	.12	-.02, .46	.12	.19	-.26, .50	.03	.17	-.31, .37
Financial strain	.07	.05	-.02, .16	-.15	.06	-.27, -.03	-.17	.06	-.29, -.06	-.25	.09	-.44, -.07	.16	.08	-.00, .33
Parents' education	.12	.05	.02, .21	-.02	.07	-.15, .11	-.03	.06	-.16, .09	.01	.10	-.19, .21	.24	.09	.06, .42
Social distancing Motivation	-	-	-	-.03	.09	-.20, .15	-.12	.09	-.28, .05	.00	.14	-.27, .27	.23	.12	-.01, .47
Lockdown	.20	.06	.07, .33	.02	.09	-.15, .19	.13	.09	-.04, .29	-.01	.13	-.28, .25	-.07	.12	-.31, .17
Parents' rules	.22	.07	.09, .35	.06	.09	-.12, .23	-.01	.09	-.19, .16	-.02	.14	-.29, .25	.28	.12	.03, .52
Friends said I should	-.06	.10	-.25, .13	.11	.13	-.14, .36	.26	.13	.02, .51	.34	.20	-.05, .73	-.06	.18	-.41, .29
Social responsibility	.21	.09	.03, .39	.03	.12	-.21, .27	-.05	.12	-.29, .19	-.35	.19	-.73, .03	.10	.17	-.23, .44
Avoid personal sick	.07	.07	-.07, .21	.19	.10	.01, .38	-.12	.09	-.31, .06	-.32	.15	-.61, -.03	.07	.13	-.19, .33
Avoid others sick	.15	.10	-.04, .34	.24	.13	-.01, .50	.14	.13	-.11, .40	.17	.20	-.22, .57	.25	.18	-.10, .60
No alternatives	-.20	.08	-.36, -.04	-.20	.11	-.41, .02	-.02	.11	-.23, .19	-.17	.17	-.50, .16	.10	.15	-.20, .40
Prefer to stay home	.09	.08	-.06, .25	-.30	.11	-.51, -.09	-.35	.10	-.55, -.14	.03	.16	-.29, .35	-.18	.15	-.46, .11
Avoid judgment	-.24	.12	-.48, .01	.35	.17	.03, .68	-.27	.16	-.05, .59	.31	.26	-.20, .81	-.12	.23	-.57, .33
R ² /R ² adjusted	.139/.118			.105/.083			.080/.057			.044/.020			.055/.031		

Bolded values are significant at $p < .05$. Motivations were coded as endorsed/not endorsed. CI = confidence interval, SE = standard error of mean.

Most youth were engaging in social distancing a lot (26.9%) or a great deal (56.6%), with fewer youth engaging in social distancing somewhat (13.0%) or a little (3.5%). A total of 13 youth (1.9%) indicated that they were not currently social distancing and were thus omitted from the sample (Note that these youth were excluded from our primary models because they were unable to indicate motivations to engage in social distancing, thus introducing a dependency in the data. Sensitivity analyses indicated that including these youth in models predicting mental and social health did not change the pattern of findings.). Our first aim was to descriptively examine adolescents' motivations to engage in social distancing. Table 1 displays the frequencies of motivations to engage in social distancing. Youth most commonly referenced prosocial motivations, including social responsibility (78.1%) and not wanting others to get sick (77.9%), to engage in social distancing. Control-based motivations were also common and included being in a city or state on lockdown (60.9%) and parents making youth social distance (54.5%). Fewer youth reported personal motivations, such as not wanting to personally get sick (57.8%), having a preference to stay home (21.3%), or that there are no alternatives (i.e., there is nothing else going on; 17.8%). In addition, some youth indicated that they engaged in social distancing because a friend told them they should (13.9%) or they did not want to be judged by others (7.0%).

Our second aim was to examine links between adolescents' motivations for social distancing and the degree to which they actually engaged in social distancing. Multiple regression analyses accounting for adolescent age, gender, race, ethnicity, financial strain, and parents' education were conducted. Table 2 displays the model estimates, and Figure 1 displays boxplots for all significant effects. Youth who reported engaging in social distancing because their state or city was on lockdown, their parents were making them, and it is socially responsible were found to be engaging in more social distancing than youth who did not endorse these reasons. In addition, youth who reported engaging in social distancing because there are no alternatives were found to be social distancing less than youth who did not endorse this reason.

Our third aim was to test associations between adolescents' motivations for engaging in social distancing and their mental and social health. Table 2 displays model estimates from four multiple regressions testing these associations accounting for age, gender, race, ethnicity, financial strain, parents' education, and degree of social distancing. Across all models, we did not find evidence of an association between degree of social distancing engagement and any indicator of mental or social health. Youth who were social distancing because they did not want to personally get sick or because they wanted to avoid judgment reported greater anxiety symptoms. Furthermore, those who were social distancing because they would have otherwise preferred to stay home reported less anxiety and depressive symptoms. Youth who engaged in social distancing because a friend told them reported greater depressive symptoms. Youth who were social distancing because they did not want to get personally sick reported lower feelings of burdensomeness, and those who were social distancing because their parents made them reported greater belongingness.

Discussion

The COVID-19 pandemic is a global event that has had unprecedented effects on adolescents' daily lives. Reducing the

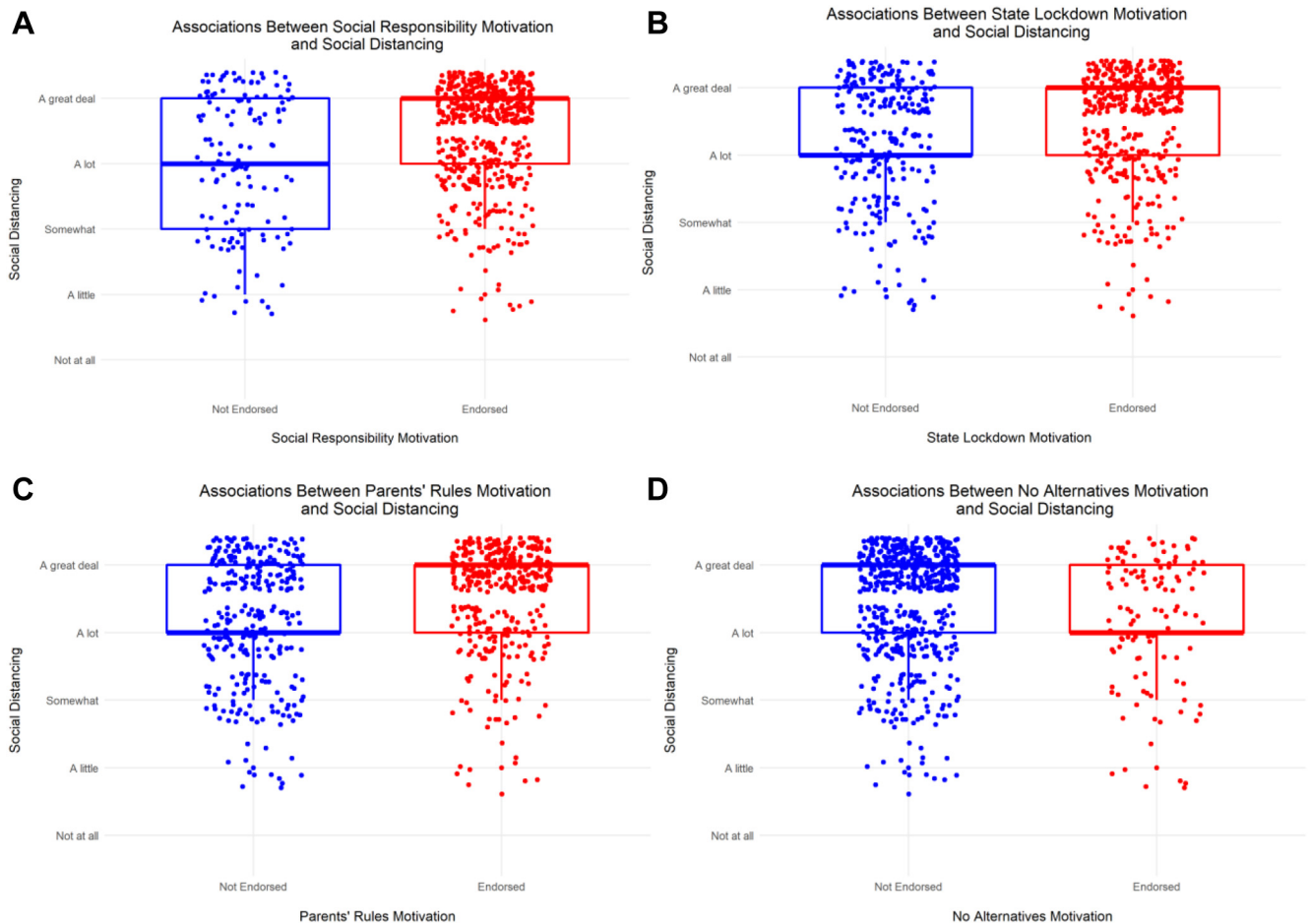


Figure 1. Boxplots displaying differences in degree of social distancing by motivation. (A) Associations between social responsibility motivation and social distancing. (B) Associations between state lockdown motivation and social distancing. (C) Associations between parents' rules motivation and social distancing. (D) Associations between no alternatives motivation and social distancing. Only significant effects are displayed.

spread of the virus requires individuals to limit physical contact with others by engaging in social distancing. The purpose of this study was to examine adolescents' motivations for social distancing and how these motivations were connected with their perceived degree of social distancing, mental health, and social health. Youth endorsed a variety of prosocial, control, and autonomous motivations for social distancing, including social responsibility, not wanting to personally get sick or get others sick, complying with state or parental rules and peer recommendations, and because alternative activities were unavailable. These motivations were differentially associated with degree of social distancing, as well as depressive symptoms, anxiety symptoms, burdensomeness, and belongingness.

Adolescents most commonly reported engaging in social distancing for prosocial reasons including recognition that social distancing is a social responsibility and to help ensure that others do not get sick. Furthermore, social responsibility motivations were associated with engaging in more social distancing. These findings extend previous research which indicates that adolescents' social responsibility values were associated with greater disinfecting behavior and less hoarding behavior in the week after COVID-19 was declared a US national emergency [4]. In contrast, youth who indicated that they were engaging in social

distancing because they lacked alternatives reported less social distancing. Youth motivated by a lack of alternatives may be social distancing only if it is convenient and does not conflict with more appealing experiences. Importantly, youth who reported that they were social distancing because of governmental sanctions or parental rules were also more engaged in social distancing than those who did not endorse these motives. These findings hold promise for the efficacy of local governments and parents to help increase adolescents' compliance with social distancing recommendations.

Adolescents' motivations to engage in social distancing were associated with their mental and social health during the COVID-19 pandemic. For instance, youth who were social distancing to avoid personal illness reported not only greater anxiety but also less burdensomeness. Disease-related threat has been shown to prompt feelings of anxiety in youth [21], and similar processes may be occurring during the COVID-19 pandemic. Alternatively, youth who are more anxious may be more focused on their personal health and thus engage in social distancing as means of self-protection. Although speculative, youth who are social distancing to avoid becoming personally sick may also be more concerned or vigilant, prompting less worry from family members and providing them with a lower sense of burdensomeness.

Youth who engaged in social distancing to avoid social judgment reported more anxiety symptoms, and those who were social distancing because of friends' recommendations reported greater depressive symptoms. Past research shows that symptomatic youth are more sensitive to social judgment or peer rejection [22], which might explain these findings. Our findings highlight how connections between depressive symptoms and social judgments among youth may unfold during a time of heightened social distancing.

Notably, we did not find evidence that control motivations for social distancing (i.e., government or parental rules) were negatively associated with mental or social health. Rather, youth who reported social distancing because of parental rules also reported feeling a *greater* sense of belongingness. Parental monitoring is generally positively correlated with greater warmth [23]. Potentially, youth may interpret parental rules about social distancing as a reflection of warmth, caring, and concern for their well-being. It is also possible that youth with a greater sense of belonging are more likely to follow parental rules.

It is important to highlight that a subset of youth (25%) reported that they were social distancing because they would prefer to stay home regardless of whether social distancing policies and recommendations were in place. Youth who reported that they would prefer to stay home also reported lower anxiety and depressive symptoms, relative to those who did not report this motivation. It is possible that youth who prefer staying home may be struggling less with reduced social contact. Conversely, youth who did not indicate that they would prefer to stay home (suggesting that they would rather be engaged in social activity outside of their home) may be at the greatest risk for experiencing anxiety or depressive symptoms. Future research is needed to examine the long-term impact of social distancing on the mental and social health of these youth.

Limitations and future directions

Findings should be interpreted in the context of certain limitations. Data were cross-sectional, and causal or temporal interpretations cannot be made. Future research is needed to examine within-person, longitudinal associations between social distancing, motivation, and mental and social health. Social distancing may be connected with within-person change in mental health across time as youth experience a longer duration of social distancing. Although our sample was recruited from across the United States, participants self-selecting into this study via social media may be prone to selection bias. Furthermore, youth were primarily white and female, which may limit the generalizability of our findings. Future studies would benefit from examining social distancing motivation in a more diverse sample of youth.

Researchers have highlighted that motivation is multidimensional and includes beliefs about a person's ability to engage in an activity, reasons for engagement, and emotional reactions related to the activity [24]. The measure of motivation used in this study was based on past research [6] and primarily focused on reasons for engagement; future research would benefit from capturing the multidimensional nature of adolescents' motivations for social distancing. In addition, this study did not capture adolescents' reasons for not engaging in social distancing, and future research may benefit from understanding why some youth are not social distancing to a greater degree. Social

distancing was measured using a single item that captured youths' perception of whether they were social distancing. Although perception-based measures were used given the relevance of perceived social isolation for mental health [19], it is unknown how these perceptions align with objective social distancing or whether the single item captures engagement in multiple forms of social distancing. Future research is needed to examine multiple facets of youths' social distancing using validated measures. The burdensomeness and belongingness measures used in this study were adapted for repeated assessment and were composed of only a few items, and social health may be better assessed using a larger battery of questions [25].

Despite these limitations, our findings have important implications for parents, educators, and policy makers. Specifically, our findings highlight that social distancing may be more or less problematic for youth depending on their reason for engagement. Parents, educators, and policy makers may benefit from understanding why teens are social distancing, present alternative reasons to social distance, or help guide motivations in a way that might promote compliance. Overall, our findings highlight that adolescents have varied motivations for complying with social distancing recommendations during the COVID-19 pandemic and that these motivations may be indicative of individual differences in how social distancing may impact teens. Future research should explore moderators of these associations between mental health and experiences with social distancing or isolation from peers (e.g., introversion/extraversion). It will be important to continue to monitor teens' motivations for social distancing and their connections with compliance and mental health as these associations may change as the pandemic evolves and social distancing may occur for an extended duration.

Acknowledgments

This research was supported by the Center for American Indian and Rural Health Equity (CAIRHE) at Montana State University, United States.

Supplementary Data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.jadohealth.2020.05.004>.

References

- [1] World Health Organization. Coronavirus disease 2019 (COVID-19) situation report – 62. Available at: https://www.who.int/docs/default-source/coronavirus/situation-reports/20200322-sitrep-62-covid-19.pdf?sfvrsn=755c76cd_2. Accessed April 1, 2020.
- [2] White House. Proclamation on declaring a national emergency concerning the novel Coronavirus Disease (COVID-19) outbreak. Available at: <https://www.whitehouse.gov/presidential-actions/proclamation-declaring-national-emergency-concerning-novel-coronavirus-disease-covid-19-outbreak/>. Accessed April 3, 2020.
- [3] World Health Organization. Coronavirus disease 2019 (COVID-19) situation report – 74. Available at: https://www.who.int/docs/default-source/coronavirus/situation-reports/20200403-sitrep-74-covid-19-mp.pdf?sfvrsn=4e043d03_2. Accessed April 3, 2020.
- [4] Oosterhoff B, Palmer C. Psychological correlates of news monitoring, social distancing, disinfecting, and hoarding behaviors among US adolescents during the COVID-19 pandemic. 2020. <https://doi.org/10.31234/osf.io/rpcy4>.
- [5] Deci EL, Ryan RM. Self-determination theory: A macrotheory of human motivation, development, and health. *Can Psychol* 2008;49:182–5.
- [6] Hardy SA, Dollahite DC, Johnson N, Christensen JB. Adolescent motivations to engage in pro-social behaviors and abstain from health-risk behaviors: A self-determination theory approach. *J Pers* 2015;83:479–90.

- [7] Weinstein N, Ryan RM. When helping helps: Autonomous motivation for prosocial behavior and its influence on well-being for the helper and recipient. *J Pers Soc Psychol* 2010;98:222–44.
- [8] Eisenberg N, VanSchyndel SK, Spinrad TL. Prosocial motivation: Inferences from an opaque body of work. *Child Dev* 2016;87:1668–78.
- [9] Gebauer JE, Riketta M, Broemer P, Maio GR. Pleasure and pressure based prosocial motivation: Divergent relations to subjective well-being. *J Res Pers* 2008;42:399–420.
- [10] Lee FS, Heimer H, Giedd JN, et al. Adolescent mental health—opportunity and obligation. *Science* 2014;346:547–9.
- [11] Ahmed SP, Bittencourt-Hewitt A, Sebastian CL. Neurocognitive bases of emotion regulation development in adolescence. *Dev Cogn Neurosci* 2015; 15:11–25.
- [12] Spear L. *The behavioral neuroscience of adolescence*. New York, NY: WW Norton & Company; 2010.
- [13] Furman W, Buhrmester D. Children's perceptions of the personal relationships in their social networks. *Dev Psychol* 1985;21:1016–24.
- [14] Smetana JG, Campione-Barr N, Metzger A. Adolescent development in interpersonal and societal contexts. *Annu Rev Psychol* 2006;57:255–84.
- [15] Joiner T. *Why people die by suicide*. Cambridge, MA: Harvard University Press; 2007.
- [16] Kessler RC, Avenevoli S, Costello EJ, et al. Prevalence, persistence, and sociodemographic correlates of DSM-IV disorders in the national Comorbidity survey Replication adolescent supplement. *Arch Gen Psychiatry* 2012;69:372–80.
- [17] Open Science Collaboration. Estimating the reproducibility of psychological science. *Science* 2015;349:aac4716.
- [18] Galinsky E. *Ask the children: What America's children really think about working parents*. New York, NY: William Morrow and Company, Inc.; 1999.
- [19] Cornwell EY, Waite LJ. Social disconnectedness, perceived isolation, and health among older adults. *J Health Soc Behav* 2009;50:31–48.
- [20] Quinn H, Thissen D, Liu Y, et al. Using item response theory to enrich and expand the PROMIS® pediatric self-report banks. *Health Qual Life Outcomes* 2014;12:160.
- [21] Piacentini J, Bergman RL, Keller M, McCracken J. Functional impairment in children and adolescents with obsessive-compulsive disorder. *J Child Adolesc Psychopharmacol* 2003;13:61–9.
- [22] Platt B, Kadosh KC, Lau JY. The role of peer rejection in adolescent depression. *Depress Anxiety* 2013;30:809–21.
- [23] Lowe K, Dotterer AM. Parental monitoring, parental warmth, and minority youths' academic outcomes: Exploring the integrative model of parenting. *J Youth Adolesc* 2013;42:1413–25.
- [24] Green J, Arief G, Martin A, et al. Academic motivation, self-concept, engagement, and performance in high school: Key processes from a longitudinal perspective. *J Adolesc* 2012;35:1111–22.
- [25] Hill RM, Rey Y, Marin CE, et al. Evaluating the Interpersonal Needs Questionnaire: Comparison of the reliability, factor structure, and predictive validity across five versions. *Suicide Life Threat Behav* 2015;45: 302–14.