



# Predictors of Adolescent Resilience During the COVID-19 Pandemic in a Community Sample of Hispanic and Latinx Youth: Expressive Suppression and Social Support

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## Abstract

The COVID-19 pandemic has created unprecedented disruptions in the daily lives and mental health of adolescents. Less attention has been given to the psychosocial resources that may mitigate the impact of COVID-19 on adolescent mental health, particularly among minoritized populations. In the present study, 259 youth (aged 11–18) were recruited from a community center for integrated prevention and intervention services in a predominantly Latinx and Hispanic community. Youth completed questionnaires about the impact COVID-19 has had on their lives, psychosocial resources (humor, optimism, emotion regulation, social support), and psychiatric symptoms (depressive symptoms, anxiety symptoms, sleep disturbances, aggression). After accounting for age, sex, and exposure to early life adversity, higher reported COVID-19 impact was associated with more depressive symptoms,  $b = 6.37$  ( $SE = 1.67$ ), 95%  $CI$  [3.08, 9.66],  $p < 0.001$ , more anxiety symptoms,  $b = 9.97$  ( $SE = 1.63$ ), 95%  $CI$  [6.75, 13.18],  $p < 0.001$ , and more sleep disturbances,  $b = 1.24$  ( $SE = 0.34$ ), 95%  $CI$  [0.57, 1.91],  $p < 0.001$ . Youth that reported infrequent expressive suppression and the lowest scores on giving social support were at the greatest risk for aggressive behavior in the context of high COVID-19 impact,  $ps < 0.007$ . Increasing emotion regulation skills, such as expressive suppression, and opportunities to give social support may promote resilience among high risk youth in the context of this ongoing community stressor.

**Keywords** COVID-19 pandemic · Hispanic adolescents · Resilience · Expressive suppression · Social support · Aggression

The lives of youth around the world were significantly altered by the broad range of pandemic-related changes that began in early 2020, including the sudden transition to online school, near prohibition of in-person interactions with friends and peers, and increase in time spent in the home environment (de Figueiredo et al., 2021). These changes were compounded by concern over the prospect or reality of those around them becoming infected with COVID-19 and losing their lives, financial instability, and many other potential stressors associated with the pandemic. For adolescents, this global event occurred during a sensitive period

in development, when youth are supposed to become less dependent upon their families, strengthen their peer relationships, and significant brain maturation occurs (Konrad et al., 2013; Steinberg & Morris, 2001), leaving them particularly vulnerable to the stressors of the pandemic. Initially, there was uncertainty regarding the pandemic's duration, as well as its potential short- and long-term impact on adolescent well-being. Within the first six months, however, its detrimental effects were increasingly apparent, with strong associations between pandemic-related experiences and symptoms of depression, anxiety, sleep disturbances, and aggression in adolescents (Kuhlman et al., 2021). Increasing mental health problems, including suicidality, continued to be reported by adolescents in early to mid-2021 (Jones et al., 2022). More than two years later, the pandemic has turned into a chronic stressor; as it continues, its sustained impact on mental health may have repercussions on these adolescents' physical and psychological well-being into their adulthood and beyond.

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Although there has been a great deal of public concern surrounding the impact of the COVID-19 pandemic on adolescent mental health, findings on the association between COVID-19 impact and adolescent mental health have been mixed. At the onset of the pandemic, a cross-sectional study in China showed alarming rates of anxiety and depression in high school students: almost half were experiencing clinically-elevated depressive symptoms, and over one third were experiencing clinically elevated anxiety symptoms (Zhou et al., 2020). Longitudinal data from the United States of America (U.S.), Iceland, and Germany also showed elevated symptoms of anxiety and depression and decreased life satisfaction among adolescents relative to pre-pandemic (Magson et al., 2021; Ravens-Sieberer et al., 2022; Thorisdottir et al., 2021). Further, a systematic review concluded that the majority of adolescents have experienced deterioration in mental health during the pandemic (Panchal et al., 2021). Yet, these studies and others also observed evidence of resilience in some domains. Relative to pre-pandemic, studies on adolescent mental health in Canada and the U.S. reported decreases in substance use as well as improvements in depression, anxiety, irritability, and externalizing symptoms for some groups of youth (Cost et al., 2022; Penner et al., 2021). These mixed findings suggest that there may be psychosocial factors that contribute to resilience for some youth as well. Improving our understanding of factors that are protective against deleterious mental health sequelae of the pandemic will be of utmost importance in developing effective preventions and interventions for high-risk youth.

Several modifiable psychosocial resources may reduce the negative mental health impacts of the COVID-19 pandemic on adolescents, including emotion regulation, humor, optimism, and social support. For example, less frequent use of cognitive reappraisal, a form of emotion regulation characterized by reinterpreting situations in ways that alter their meaning and emotional sequelae, increased the strength of the association between COVID-19 impact and depressive symptoms, anxiety symptoms, sleep disturbances, and aggression (Kuhlman et al., 2021), as well as greater internalizing problems overall (e.g., depression, low self-esteem, anxiety) (Weissman et al., 2021) in adolescents. More frequent use of expressive suppression, a form of emotion regulation characterized by actively inhibiting outward signs of an emotional experience, was also linked to more internalizing problems in adolescents early in the pandemic (Weissman et al., 2021). Humor has also been identified as protective in the association between COVID-19 impact and psychiatric symptoms among adolescents (Kuhlman et al., 2021). Additionally, optimism has been an important protective factor for adolescents during COVID-19 (Xie et al., 2020), given that greater optimism during the pandemic was associated with lower internalizing difficulties, lower externalizing difficulties (e.g., aggression, bullying), more

wellbeing (Ashworth et al., 2022), as well as fewer anxiety and depressive symptoms (Zhou et al., 2020). Social support may also be an important modifiable factor for adolescents in reducing the negative sequelae of COVID-19. In particular, low and medium social support from friends and family were associated with higher prevalence of depression and anxiety symptoms (Qi et al., 2020), while high social support was associated with less loneliness and COVID-19 distress (Christ & Gray, 2022). It may be efficacious to target these psychosocial resources in interventions among adolescents when seeking to reduce the adverse effects of the COVID-19 pandemic and other prolonged stressors.

Within the U.S., individuals belonging to minoritized groups encounter greater instances of contextual stressors that stand to undermine positive mental health outcomes (Calzada et al., 2020), and these preexisting disparities have been exacerbated by the ongoing COVID-19 pandemic. Among such groups, Latinx and Hispanic individuals seem to be notably impacted by COVID-19; approximately 19% of the U.S. population is Latinx/Hispanic, yet these individuals account for one third of reported COVID-19 cases (Center for Disease Control, 2022). This disproportionate risk is compounded by well-established barriers to healthcare (Clay et al., 2021), culminating in a population that is both more likely to be impacted by COVID-19 and less likely to receive support. Yet, early findings exploring changes in Latinx/Hispanic adolescent mental health and functioning across COVID-19 have yielded mixed findings. In one of the few studies of its kind (Penner et al., 2021), a predominantly Latinx sample of adolescents showed decreases in mental health problems (internalizing, externalizing, and overall) in the early months of the pandemic (May of 2020). They suspected that, among Latinx/Hispanic families, familial bonding and support under COVID-19 shelter-in-place restrictions may have served a protective role in adolescent mental health (Penner et al., 2021). Notably, this protective effect went above and beyond the disproportionate burden experienced by their families (for example, 48.1% of the sample reported having a family member who lost a job due to the pandemic). Indeed, familism (or “familismo”)—a core Latino value emphasizing family relationships—has been identified as both predictive of better physical and mental health, as well as protective against psychological stress (Corona et al., 2017). This is in contrast to other findings which suggest that stressors related to ongoing COVID-19 impact (i.e. greater household/childcare responsibilities, familial hospitalization, financial insecurity) are linked with increases in internalizing and externalizing symptoms among Latinx/Hispanic adolescents (Roche et al., 2022). However, explorations of protective factors against adolescent mental health problems during the COVID-19 pandemic among Latinx/Hispanic youth remain limited despite the utility such investigations have in generating meaningful

interventions for this population and the widely-acknowledged importance of overcoming biases in research sampling (Yancey et al., 2006). Specifically, it remains unknown whether protective factors identified in other adolescent populations, including emotional regulation skills, humor styles, optimism, and social support (Ashworth et al., 2022; Kuhlman et al., 2021; Qi et al., 2020; Weissman et al., 2021; Xie et al., 2020; Zhou et al., 2020), have similarly protective roles among Latinx/Hispanic adolescents.

The purpose of this study was to determine whether the psychosocial resources previously identified as protective against the negative psychological correlates of COVID-19 (emotion regulation, humor, optimism, social support) mitigated the impact of COVID-19 on mental health in a predominantly Latinx/Hispanic sample of adolescents. We hypothesized that greater COVID-19 impact would be associated with more psychiatric symptoms, specifically greater anxiety, depressive symptoms, sleep disturbances, and aggression. These psychiatric outcomes were selected because they are the most common psychiatric problems that emerge during adolescence (Merikangas et al., 2009; Tarokh et al., 2016), and have each been linked to the stress of the COVID-19 experience (e.g., Kuhlman et al., 2021). We further hypothesized that psychosocial resources that have been linked to resilience in the context of COVID-19, such as cognitive reappraisal and frequent use of self-enhancing humor, would mitigate the association between COVID-19 and these psychiatric outcomes.

## Method

### Participants

Participants in this study were 259 youth between the ages of 11 and 18 ( $M_{\text{age}} = 15.11 \pm 2.22$ ; 52.1% female, 2.7% non-binary; 93.4% identifying as Hispanic/Latinx; 83.0% heterosexual or straight). Of the 403 youths invited to participate, 317 (79%) consented to the survey, but only 259 (64% of those invited) had complete data for the present analyses. These adolescents were members of the Project Youth OC community (*Project Youth OCBF » Empowering Youth Together*, 2022). Project Youth OC is a community organization in Santa Ana, California that provides a variety of psychoeducational programs, including juvenile justice and substance abuse diversion, as well as college and job preparedness programs. Adolescents are referred to Project Youth OC by law enforcement, schools, the probation department, the local school district's Student Attendance Review Board (SARB), and other community stakeholders subsequent to school truancy, involvement with the justice system, and through semi-annual community-serving events such as food drives and career fairs.

### Procedures

All study procedures were approved by the Institutional Review Board at the University of California Irvine. Additionally, all study procedures were developed according to best practices in conducting biobehavioral research in diverse community settings (Kuhlman, Urizar Jr, et al., 2019). Parents in the Project Youth database were informed about the study by Project Youth staff via phone call or in-person during their visits to Project Youth programs. If interested, parents received a consent form and brief survey via email that assessed demographic information. Importantly, all study recruitment materials and consent documents were available in both Spanish and English. Of the 390 parents who completed the consent form and parent survey, 58.2% opted to complete them in Spanish. After completing the consent form and parent survey, parents provided the name and contact information of their child. If parents reported that their child was over 18, an adult consent form was sent directly to the participant. Youth whose parents consented were contacted via email or text message with a link to the assent form and survey.

Data collection for this study occurred between April 2021 and April 2022. To facilitate and encourage participation, youth, many of whom face barriers to technology access, were given the option of completing the surveys at the Project Youth facility. The vast majority completed the survey in a single sitting (67.2% percent of respondents completed the survey within one hour and 83.1% completed the survey within two hours). Participants could complete the survey across multiple sittings or even days if needed and were compensated with a \$30 gift card to Target.

### Measures

**Demographic Characteristics** Participants were asked to self-report their age (in years), gender (male, female, male-to-female transgender, female-to-male transgender, gender queer / gender non-conforming, or other), race/ethnicity, early life adversity (ELA), the primary language spoken at home, and whether their parents speak English fluently. Adolescents were asked "Which race and/or ethnicity do you identify as?", provided eight response options, and directed to "select all that apply." The response options for race/ethnicity were: Asian or Pacific Islander, Black or African American, Hispanic / Spanish origin, Latino / Latinx, Middle Eastern or North African, Native American or American Indian, White / Caucasian, and Other. Whether adolescents identified as Latinx or Hispanic was queried separately because there are large populations of individuals that identify with one but not the other as well as both, particularly in southern California. As evidence of this, 71% ( $n = 184$ ) of participants identified themselves as Hispanic / Spanish origin,

40.2% ( $n = 104$ ) identified themselves as Latinx, and only 17.8% ( $n = 46$ ) identified with both. ELA was assessed via adolescent self-report using the Center for Youth Wellness Adverse Childhood Experiences Questionnaire (Purewal et al., 2016). Consistent with best practices in pediatric primary care in the state of California, respondents saw a list of 19 potential adverse childhood experiences, were asked to count how many they had experienced, and to report only the total number. Higher ELA scores reflect higher adversity exposure. Potential adversities included abuse (i.e. physical, sexual, emotional), neglect (i.e. physical, emotional), and household dysfunction (i.e. caregiver mental illness, medical illness, incarceration, substance abuse, and parental separation/divorce).

**COVID-19 Impact** Participants completed the COVID-19 Adolescent Symptom and Psychological Experience questionnaire (Ladouceur, 2020). This questionnaire consisted of two subscales: COVID-19 events and COVID-19-related concerns. The two scales were combined in order to create a measure of the overall impact of the COVID-19 pandemic on the individual (Kuhlman et al., 2021). The *COVID-19 events* subscale consisted of 13 items which asked participants whether any of the following events had happened in their household: job loss by one or both parents/guardians, you lost your job, reduced job hours for one or both parents/guardians, reduced job hours for you, difficulty paying bills or buying necessities, parent/guardian having to work longer hours, parent/guardian filed for unemployment, family applied for public assistance, you or anyone you know gotten sick with COVID-19, and anyone died from COVID-19 since the onset of the pandemic. The number of events to which participants answered “yes” was summed. *COVID-19 concern* was measured using 18 Likert-type items. Participants were asked, “In the past two weeks, including today, how concerned are you about the impact of the COVID-19 outbreak on the following...” Possible responses ranged from one “Not at all” to six “Extremely.” Examples included “Family might get sick,” “Parent/guardian might lose their job,” “Not seeing friends in person,” “Falling behind with schoolwork,” “Not having enough to eat,” “Not getting into college,” and “Missing events that were important to me (e.g., graduation).” The reliability of the COVID-19 concern subscale in this sample was excellent,  $a = 0.92$ . To create a single index of COVID-19 impact, COVID-19-related events and COVID-19-related distress were converted to  $z$ -scores and averaged such that high values reflected more COVID-19 impact.

**Psychiatric Symptoms** The current study employed four validated self-report questionnaires to determine depressive symptoms, anxiety symptoms, sleep disturbances, and reactive and proactive aggression. The Reynolds Adolescent

Depression Scale second edition (RADS-2) was used to assess self-reported depressive symptoms over the past month (Reynolds, 2010). The RADS-2 is a 30-item questionnaire which provides total depression scores ranging from 30 to 120. Scores greater than 77 differentiated respondents likely suffering from a depressive episode. The RADS-2 demonstrated excellent internal reliability in this sample,  $a = 0.95$ . Anxiety symptoms over the past month were measured via the Screen for Childhood Anxiety and Related Emotional Disorders (SCARED) (Birmaher et al., 1999), a questionnaire containing 41 items with a potential range from 0 – to 82. Example items included “I feel nervous with people I don’t know well” and “I worry about being as good as other kids.” Participants rated how true they felt each statement was for them on a three-point Likert scale ranging from zero “Not true or hardly ever true” to two “Very true or often true.” Scores greater than 25 indicated potential anxiety disorders. The internal reliability of the SCARED was excellent in the current sample,  $a = 0.95$ . Sleep disturbances over the past month were measured utilizing the Pittsburgh Sleep Quality Index (PSQI) (Buysse et al., 1989). The PSQI is a clinically-validated assessment of insomnia (Backhaus et al., 2002). This 18-item questionnaire assesses multiple domains of overall sleep functioning, including factors like sleep timing, duration, and quality. Potential scores on the PSQI range from 0 to 21, with scores of five or greater indicating the presence of insomnia or another sleep disorder. The internal reliability of the PSQI in our sample was acceptable,  $a = 0.69$ , and similar to that found in other adolescent samples (Kuhlman, Chiang, et al., 2019; Kuhlman et al., 2021), among whom some of the items (e.g., use of sleep medications) are quite infrequent. Reactive and proactive aggression were measured using the Reactive-Proactive Aggression Questionnaire (RPQ) (Raine et al., 2006), with no specified timeframe. The RPQ contains 23 items: 11 items assess reactive and 12 items assess proactive aggression. Example items for the reactive subscale included “became angry or mad when you don’t get your way” and “yelled at others when they have annoyed you,” while items from the proactive subscale included “hurt others to win a game” and “vandalized something for fun.” Participants were asked to rate the frequency with which they engaged in each item on a three-point Likert scale from zero “Never” to two “Often.” Higher scores indicate more frequent aggression. Both of the subscales (reactive:  $a = 0.87$ ; proactive:  $a = 0.88$ ) had excellent internal reliability in this sample.

**Psychosocial Resources** *Emotional Regulation.* Youth completed the Emotion Regulation Questionnaire (Gross & John, 2003), a 10-item questionnaire containing two subscales: cognitive reappraisal and expressive suppression. Cognitive reappraisal consisted of six items, such as “When I want to feel more *positive* emotion, I *change the way I’m thinking about*” and “I control my emotions by *changing the way I*

*think* about the situation I'm in." Expressive suppression included four items, such as "I keep my emotions to myself" and "When I am feeling *positive* emotions, I am careful not to express them." For each item, participants were asked to indicate the extent they agreed with each item from one "Strongly disagree" to seven "Strongly agree." Scores for each subscale were averaged, with higher scores indicating more cognitive reappraisal or expressive suppression. Cognitive reappraisal reliability was excellent,  $\alpha = 0.90$ ; expressive suppression reliability was acceptable,  $\alpha = 0.76$ .

**Humor.** Youth completed two subscales of the Humor Styles Questionnaire (Martin et al., 2003): affiliative and self-enhancing. Affiliative humor is the use of humor to facilitate and enhance one's relationships, while self-enhancing humor places the individual at the center of humor in a targeted way. Each subscale consisted of eight items that described different ways humor might be experienced. Participants responded to each item using a seven-item Likert scale to indicate the degree to which the participants agreed or disagreed with each item from one "Strongly disagree" to seven "Strongly agree." Example items from the affiliative humor subscale included "I laugh and joke a lot with my closest friends" and "I enjoy making other people laugh." Items from the self-enhancing subscale included "Even when I'm by myself, I'm often amused by the absurdities of life" and "If I am feeling upset or unhappy I usually try to think of something funny about the situation to make myself feel better." Higher scores indicate more humor in each domain. Internal reliability of affiliative humor was questionable,  $\alpha = 0.69$ , whereas internal reliability of self-enhancing humor was acceptable,  $\alpha = 0.79$ .

**Optimism.** Optimism was measured via the Life Orientation Test-Revised (LOT-R; Scheier et al., 1994), a 10-item questionnaire that assessed how optimistic participants felt about the future. Participants were asked to rate their agreement with each item from zero "Strongly disagree" to four "Strongly agree." Items from the LOT-R included "In uncertain times, I usually expect the best" and "I'm always optimistic about my future." Responses to the six optimism items were summed to compute an index for optimism such that higher scores indicate more optimism. Internal reliability of the LOT-R was questionable in this sample,  $\alpha = 0.57$ .

**Social support.** To measure social support, youth completed the giving and receiving emotional support subscales of the 2-Way Social Support Scale (Shakespeare-Finch & Obst, 2011). These subscales consisted of seven and five items, respectively, that respondents rated from zero "Not at all true" to five "Always true." Items from the giving subscale included "I am there to listen to other's problems" and "People close to me tell me their fears and worries." Items from the receiving subscale included "There is someone I can talk to about the pressures in my life" and "There is someone in my life I can get emotional support from." An average score of the items was calculated for each subscale, with higher

scores indicating more support given or received. The internal reliability of both the giving and receiving social support subscales were excellent,  $\alpha s = 0.95$ .

## Data Analysis

All variables were assessed for normality and heteroscedasticity to confirm their appropriateness for use in parametric statistical analyses. All analyses were conducted in SPSS version 28.0 using the PROCESS Macro version 4.1 (Hayes, 2013). All continuous predictors were centered at the mean for all analyses. All interactions where  $p < 0.10$  were further examined using simple slopes at  $\pm 1SD$  of the moderator. A  $p$ -value  $< 0.007$  corrects for multiple comparisons across all seven tested moderators (Abdi, 2007; Bonferroni, 1936). Given the well-established associations between age (Kessler et al., 2005), sex (Martel, 2013), ELA (McLaughlin et al., 2012), and risk for psychopathology, all models included age, sex, and ELA as covariates to allow our models to speak to risk or resilience over and above these factors.

## Results

Participant characteristics are reported in Table 1. The participants in this sample were predominantly Latinx or Hispanic, and lived in households where the primary language was Spanish. Participants reported a wide range of ELA, such that only 28.6% of the sample denied exposure to any of the adversities assessed, and 35.5% reported exposure to four or more. Participants reported frequent exposure to COVID-19 events, the most common of which were knowing someone who had been infected by COVID-19 (69.4%), knowing someone who had died from COVID-19 (37.1%), being worried that food would run out due to lack of money (36.3%), and having one (18.1%) or both parents (5.0%) become unemployed as a result of the pandemic. Participants reported, on average, being "slightly" concerned about the impact of COVID-19 on various aspects of their life. The participants in this sample reported a wide range of psychiatric symptoms, including symptoms in the clinically meaningful range; 25.9% of participants exceeded the clinical threshold for depressive symptoms, 43.6% for anxiety symptoms, and 48.6% for sleep disturbances.

After accounting for age, sex, and ELA, higher reported COVID-19 impact was associated with more depressive symptoms,  $b = 6.37$  ( $SE = 1.67$ ), 95%  $CI$  [3.08, 9.66],  $p < 0.001$ , more anxiety symptoms,  $b = 9.97$  ( $SE = 1.63$ ), 95%  $CI$  [6.75, 13.18],  $p < 0.001$ , and more sleep disturbances,  $b = 1.24$  ( $SE = 0.34$ ), 95%  $CI$  [0.57, 1.91],  $p < 0.001$ , but was not related to reactive aggression,  $b = 0.46$  ( $SE = 0.48$ ), 95%  $CI$  [-0.49, 1.41],  $p = 0.34$ , or proactive aggression,  $b = 0.06$  ( $SE = 0.32$ ), 95%  $CI$  [-0.56, 0.68],  $p = 0.85$ .

**Table 1** Participant characteristics ( $n = 259$ )

	<i>M (SD)</i>	<i>% (n)</i>	<i>% (n) above clinical threshold</i>
Age	15.11 (2.22)		
Grade	9.96 (2.29)		
Gender (female)		52.1 (135)	
Gender (non-binary)		2.7 (7)	
Sexual orientation			
Heterosexual / Straight		83.0 (215)	
Bisexual		5.4 (14)	
Gay / Lesbian		1.9 (5)	
Other		9.7 (25)	
ELA	3.22 (3.46)		35.5 (92)
Race/ethnicity*			
Asian / Pacific Islander		1.5 (4)	
Black / African American		2.7 (7)	
Hispanic / Spanish origin		71.0 (184)	
Latino / Latinx		40.2 (104)	
Middle Eastern / North African		0.4 (1)	
Native American / American Indian		5.0 (13)	
White / Caucasian		2.7 (7)	
Other		3.5 (9)	
Spanish is the primary language spoken at home		68.3 (177)	
Neither parent speaks English		51.0 (132)	
Household size	5.63 (1.75)		
<b>COVID-19</b>			
COVID-19 Events	6.16 (1.30)		
COVID-19 Concerns	3.05 (1.10)		
Combined COVID-19 Impact (z-score)	0.20 (0.60)		
<b>Primary outcomes</b>			
Depressive symptoms	62.80 (18.43)		25.9 (67)
Anxiety symptoms	24.59 (16.86)		43.6 (113)
Sleep disturbances	5.25 (3.44)		48.6 (126)
Reactive aggression	5.63 (4.41)		
Proactive aggression	1.56 (3.05)		
<b>Moderators</b>			
Cognitive reappraisal	4.16 (1.51)		
Expressive suppression	4.13 (1.45)		
Self-enhancing humor	32.98 (8.96)		
Affiliative humor	38.78 (7.85)		
Optimism	11.59 (3.66)		
Social support (Giving)	4.80 (1.35)		
Social support (Receiving)	4.47 (1.44)		

\*Groups are not mutually exclusive

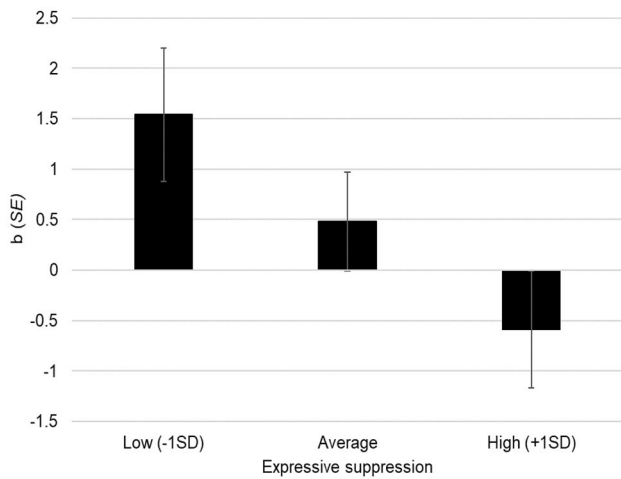
Table 2 provides the association between COVID-19 impact and each domain of psychiatric symptoms at varying levels of each psychosocial resource. Expressive suppression moderated the association between COVID-19 impact and reactive aggression,  $b = -0.73$  ( $SE = 0.27$ ), 95%  $CI$  [-1.26, -0.21],  $p = 0.006$ , such that COVID-19 was only associated with reactive aggression among youth who also

reported low expressive suppression. See Fig. 1. Expressive suppression did not moderate the association between COVID-19 impact and depressive symptoms,  $b = 0.84$  ( $SE = 0.92$ ), 95%  $CI$  [-0.97, 2.65],  $p = 0.36$ , anxiety symptoms,  $b = 1.50$  ( $SE = 0.89$ ), 95%  $CI$  [-0.24, 3.25],  $p = 0.09$ , proactive aggression,  $b = -0.19$  ( $SE = 0.18$ ), 95%  $CI$  [-0.53, 0.16],  $p = 0.30$ , or sleep disturbances,  $b = 0.24$  ( $SE = 0.19$ ),

**Table 2** Associations between COVID-19 impact and psychiatric symptoms at high (+1SD), average, and low (-1SD) values of each psychosocial resource

Depressive symptoms		Anxiety symptoms		Reactive aggression		Proactive aggression		Sleep disturbances		
<i>b</i> (SE)	95%CI	<i>b</i> (SE)	95%CI	<i>b</i> (SE)	95%CI	<i>b</i> (SE)	95%CI	<i>b</i> (SE)	95%CI	
<b>Cognitive reappraisal</b>										
High	<b>8.69 (2.25)***</b>	<b>4.26, 13.13</b>	<b>9.37 (2.19)***</b>	<b>5.06, 13.68</b>	0.24 (0.65)	-1.05, 1.53	0.13 (0.42)	-0.69, 0.95	<b>1.56 (0.45)***</b>	<b>0.67, 2.45</b>
Average	<b>6.89 (1.69)***</b>	<b>3.57, 10.22</b>	<b>9.54 (1.64)***</b>	<b>6.31, 12.77</b>	0.50 (0.49)	-0.46, 1.46	0.18 (0.31)	-0.44, 0.80	<b>1.37 (0.34)***</b>	<b>0.71, 2.04</b>
Low	5.09 (1.21)*	0.73, 9.45	<b>9.71 (2.15)***</b>	<b>5.47, 13.95</b>	0.76 (0.64)	-0.50, 2.03	0.23 (0.41)	-0.58, 1.05	1.18 (0.44)*	0.31, 2.06
<b>Expressive suppression</b>										
High	<b>6.23 (2.01)**</b>	<b>2.27, 10.18</b>	<b>10.59 (1.94)**</b>	<b>6.77, 14.41</b>	-0.59 (0.58)	-1.74, 0.56	-0.08 (0.38)	-0.84, 0.67	<b>1.38 (0.41)***</b>	<b>0.57, 2.19</b>
Average	<b>5.00 (1.68)**</b>	<b>1.69, 8.31</b>	<b>8.40 (1.62)***</b>	<b>5.21, 11.60</b>	0.48 (0.49)	-0.49, 1.44	0.18 (0.32)	-0.45, 0.82	<b>1.03 (0.34)**</b>	<b>0.35, 1.71</b>
Low	3.78 (2.28)	-0.71, 8.27	<b>6.21 (2.20)**</b>	<b>1.88, 10.54</b>	1.54 (0.66)*	0.24, 2.85	0.45 (0.44)	-0.41, 1.32	0.68 (0.47)	-0.24, 1.60
<b>Self-enhancing humor</b>										
High	5.60 (2.26)*	1.13, 10.05	<b>9.78 (2.20)***</b>	<b>5.45, 14.11</b>	-0.27 (0.64)	-1.54, 0.99	-0.26 (0.43)	-1.10, 0.58	<b>1.28 (0.46)**</b>	<b>0.38, 2.18</b>
Average	<b>6.40 (1.69)***</b>	<b>3.07, 9.72</b>	<b>9.89 (1.64)***</b>	<b>6.66, 13.11</b>	0.35 (0.48)	-0.59, 1.30	0.02 (0.32)	-0.60, 0.65	<b>1.25 (0.34)***</b>	<b>0.58, 1.93</b>
Low	<b>7.20 (2.04)***</b>	<b>3.19, 11.21</b>	<b>10.00 (1.98)***</b>	<b>6.10, 13.89</b>	0.98 (0.58)+	-0.16, 2.12	0.31 (0.38)	-0.45, 1.06	<b>1.23 (0.41)**</b>	<b>0.42, 2.04</b>
<b>Affiliative humor</b>										
High	<b>7.68 (2.26)***</b>	<b>3.23, 12.13</b>	<b>9.91 (2.21)***</b>	<b>5.56, 14.25</b>	1.02 (0.65)	-0.27, 2.31	0.31 (0.43)	-0.54, 1.15	1.16 (0.46)*	0.27, 2.06
Average	<b>6.32 (1.69)***</b>	<b>3.00, 9.64</b>	<b>9.82 (1.65)***</b>	<b>6.58, 13.07</b>	0.55 (0.49)	-0.41, 1.51	0.08 (0.32)	-0.55, 0.70	<b>1.18 (0.34)***</b>	<b>0.51, 1.85</b>
Low	4.96 (2.04)*	0.94, 8.98	<b>9.74 (1.99)***</b>	<b>5.81, 13.67</b>	0.08 (0.59)	-1.09, 1.24	-0.15 (0.38)	-0.91, 0.60	<b>1.19 (0.41)**</b>	<b>0.38, 2.00</b>
<b>Optimism</b>										
High	<b>6.61 (1.90)***</b>	<b>2.87, 10.35</b>	<b>12.69 (1.96)***</b>	<b>8.82, 16.56</b>	-0.20 (0.59)	-1.36, 0.96	-0.03 (0.39)	-0.80, 0.74	<b>1.22 (0.40)**</b>	<b>0.42, 2.02</b>
Average	<b>5.99 (1.56)***</b>	<b>2.93, 9.06</b>	<b>9.50 (1.61)***</b>	<b>6.32, 12.68</b>	0.53 (0.48)	-0.43, 1.48	0.02 (0.32)	-0.61, 0.65	<b>1.15 (0.33)***</b>	<b>0.49, 1.80</b>
Low	5.38 (2.11)*	1.22, 9.54	<b>6.31 (2.19)**</b>	<b>2.00, 10.62</b>	1.26 (0.66)+	-0.04, 2.55	0.08 (0.43)	-0.77, 0.93	1.07 (0.45)*	0.18, 1.96
<b>Social support (giving)</b>										
High	<b>7.09 (2.20)***</b>	<b>2.96, 11.22</b>	<b>10.32 (2.04)***</b>	<b>6.31, 14.33</b>	-0.50 (0.60)	-1.68, 0.68	-0.54 (0.38)	-1.29, 0.20	<b>1.41 (0.42)***</b>	<b>0.58, 2.24</b>
Average	<b>6.95 (1.72)***</b>	<b>3.56, 10.33</b>	<b>9.44 (1.67)***</b>	<b>6.15, 12.73</b>	0.62 (0.49)	-0.34, 1.59	0.39 (0.31)	-0.22, 1.00	<b>1.34 (0.34)***</b>	<b>0.66, 2.02</b>
Low	6.78 (2.55)*	1.75, 11.81	<b>8.45 (2.48)***</b>	<b>3.56, 13.33</b>	1.89 (0.73)*	0.45, 3.32	<b>1.44 (0.46)**</b>	<b>0.53, 2.35</b>	1.26 (0.51)*	0.25, 2.27
<b>Social support (receiving)</b>										
High	4.84 (2.12)*	0.67, 9.01	<b>7.01 (2.18)**</b>	<b>2.72, 11.30</b>	0.60 (0.65)	-0.68, 1.89	0.07 (0.42)	-0.76, 0.91	0.96 (0.44)*	0.09, 1.83
Average	<b>6.05 (1.58)***</b>	<b>2.95, 9.16</b>	<b>9.61 (1.62)***</b>	<b>6.42, 12.80</b>	0.48 (0.49)	-0.48, 1.44	0.05 (0.31)	-0.57, 0.67	<b>1.18 (0.33)***</b>	<b>0.53, 1.83</b>
Low	<b>7.26 (1.94)***</b>	<b>3.44, 11.08</b>	<b>12.21 (2.00)***</b>	<b>8.28, 16.14</b>	0.35 (0.60)	-0.83, 1.53	0.02 (0.39)	-0.74, 0.78	<b>1.40 (0.41)***</b>	<b>0.60, 2.19</b>

Bold values indicate statistically significant effect correcting for multiple comparisons. \*\*\*p < 0.001, \*\*p < 0.007, \*p < 0.05, +p < 0.10



**Fig. 1** The association between COVID-19 impact and reactive aggression at low, average, and high expressive suppression

95% CI [-0.13, 0.61],  $p=0.20$ . Cognitive reappraisal did not moderate the association between COVID-19 impact and depressive symptoms,  $b = 1.19$  ( $SE=0.97$ ), 95% CI [-0.71, 3.10],  $p=0.22$ , anxiety symptoms,  $b = -0.11$  ( $SE=0.94$ ), 95% CI [-1.96, 1.74],  $p=0.90$ , reactive aggression,  $b = -0.17$  ( $SE=0.28$ ), 95% CI [-0.73, 0.38],  $p=0.54$ , proactive aggression,  $b = -0.03$  ( $SE=0.18$ ), 95% CI [-0.39, 0.32],  $p=0.85$ , or sleep disturbances,  $b = 0.12$  ( $SE=0.19$ ), 95% CI [-0.26, 0.51],  $p=0.52$ .

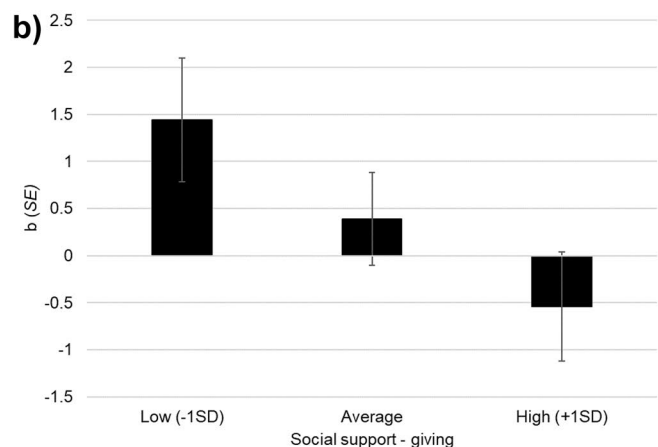
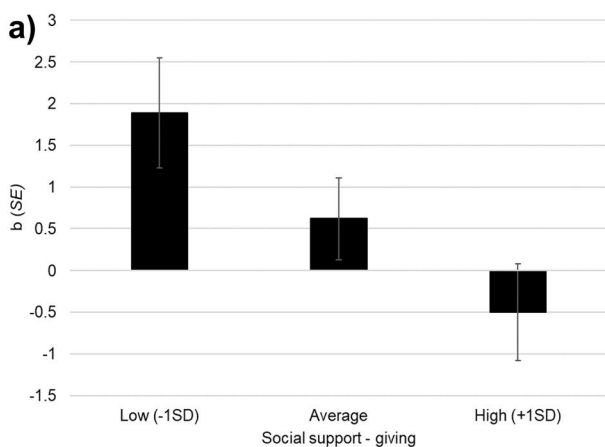
Self-enhancing humor did not moderate the association between COVID-19 impact and depressive symptoms,  $b = -0.09$  ( $SE=0.15$ ), 95% CI [-0.38, 0.20],  $p=0.55$ , anxiety symptoms,  $b = -0.01$  ( $SE=0.15$ ), 95% CI [-0.30, 0.27],  $p=0.93$ , reactive aggression,  $b = -0.07$  ( $SE=0.04$ ), 95% CI [-0.15, 0.01],  $p=0.10$ , proactive aggression,  $b = -0.03$  ( $SE=0.03$ ), 95% CI [-0.09, 0.02],  $p=0.26$ , or sleep

disturbances,  $b = 0.003$  ( $SE=0.03$ ), 95% CI [-0.06, 0.06],  $p=0.91$ .

Affiliative humor did not moderate the association between COVID-19 impact and depressive symptoms,  $b = 0.17$  ( $SE=0.17$ ), 95% CI [-0.17, 0.51],  $p=0.31$ , anxiety symptoms,  $b = 0.01$  ( $SE=0.17$ ), 95% CI [-0.32, 0.34],  $p=0.95$ , reactive aggression,  $b = 0.06$  ( $SE=0.05$ ), 95% CI [-0.04, 0.16],  $p=0.22$ , proactive aggression,  $b = 0.03$  ( $SE=0.03$ ), 95% CI [-0.03, 0.09],  $p=0.36$ , or sleep disturbances,  $b = -0.002$  ( $SE=0.03$ ), 95% CI [-0.07, 0.06],  $p=0.96$ .

Optimism moderated the association between COVID-19 impact and anxiety symptoms,  $b = 0.87$  ( $SE=0.36$ ), 95% CI [0.17, 1.58],  $p=0.016$ , though this moderation did not survive the correction for multiple comparisons. Specifically, the association between COVID-19 and anxiety symptoms increased with greater optimism. Optimism did not moderate the association between COVID-19 impact and depressive symptoms,  $b = 0.17$  ( $SE=0.35$ ), 95% CI [-0.51, 0.85],  $p=0.63$ , reactive aggression,  $b = -0.20$  ( $SE=0.11$ ), 95% CI [-0.41, 0.01],  $p=0.06$ , proactive aggression,  $b = -0.02$  ( $SE=0.07$ ), 95% CI [-0.16, 0.12],  $p=0.83$ , or sleep disturbances,  $b = 0.02$  ( $SE=0.07$ ), 95% CI [-0.12, 0.17],  $p=0.78$ .

Giving social support moderated the association between COVID-19 impact and both reactive and proactive aggression,  $b = -0.93$  ( $SE=0.20$ ), 95% CI [-1.62, -0.25],  $p=0.008$  and  $b = -0.77$  ( $SE=0.22$ ), 95% CI [-1.21, -0.34],  $p=0.0006$  respectively. Specifically, COVID-19 impact was only associated with higher aggression, in both domains, among youth who reported giving very little social support. See Fig. 2. Giving social support did not moderate the association between COVID-19 impact and depressive symptoms,  $b = 0.12$  ( $SE=1.23$ ), 95% CI [-2.29, 2.53],  $p=0.92$ , anxiety symptoms,  $b = 0.73$  ( $SE=1.19$ ),



**Fig. 2** The association between COVID-19 impact and (a) reactive and (b) proactive aggression at low, average, and high values of giving social support



95% *CI* [-1.61, 3.08],  $p = 0.54$ , or sleep disturbances,  $b = 0.06$  ( $SE = 0.25$ ), 95% *CI* [-0.43, 0.54],  $p = 0.81$ .

Receiving social support did not moderate the association between COVID-19 impact and depressive symptoms,  $b = -0.84$  ( $SE = 0.89$ ), 95% *CI* [-2.58, 0.91],  $p = 0.35$ , anxiety symptoms,  $b = -1.80$  ( $SE = 0.91$ ), 95% *CI* [-3.60, -0.006],  $p = 0.05$ , reactive aggression,  $b = 0.09$  ( $SE = 0.27$ ), 95% *CI* [-0.45, 0.63],  $p = 0.75$ , proactive aggression,  $b = 0.02$  ( $SE = 0.18$ ), 95% *CI* [-0.33, 0.37],  $p = 0.92$ , or sleep disturbances,  $b = -0.15$  ( $SE = 0.19$ ), 95% *CI* [-0.52, 0.21],  $p = 0.41$ .

## Discussion

The purpose of this study was to characterize the psychosocial resources that mitigated psychiatric symptoms in the context of the COVID-19 pandemic in a sample of predominantly Hispanic/Latinx adolescents. As expected, youth who reported more COVID-19 impact also reported more depressive symptoms, anxiety symptoms, and sleep disturbances. Emotion regulation in the domain of expressive suppression as well as giving social support moderated risk for psychiatric symptoms in the context of COVID-19. Specifically, COVID-19 impact was only associated with aggression in this sample for youth reporting low expressive suppression and infrequently giving social support. These observations extend our understanding of the role COVID-19 has played in adolescent mental health to a community that is underrepresented in psychiatric research and at very high risk for health disparities (Kuhlman, Urizar Jr, et al., 2019; Oh et al., 2015), and the potential psychosocial factors that may promote resilience in the face of similar community-level stressors in this population.

While COVID-19 impact was associated with depressive symptoms, anxiety symptoms, and sleep disturbances in this sample, aggression (both reactive and proactive) was the only domain moderated by psychosocial resources. Reactive aggression encompasses behaviors conducted in response to a real or perceived threat (“hot-headed” aggression), while proactive aggression describes behaviors that occur in the absence of threat, and often to achieve personal gain (“cold-blooded” aggression) (Raine et al., 2006). In general, a greater number of psychosocial resources moderated the association between COVID-19 impact and reactive aggression, but both aggressive outcomes were modifiable by the amount of *given* social support. Specifically, the association between COVID-19 impact and both types of aggression were only apparent among adolescents who infrequently gave social support. This may indicate that giving social support is protective against aggression in the context of a prolonged, community-level stressor such as the COVID-19 pandemic. A wealth of literature exploring aggression in adolescence has identified *receiving* social support (from family, peers, and teachers) as

an important buffer between contextual stressors and aggressive outcomes in primarily minoritized samples (Benhorin & McMahon, 2008). However, giving social support is seldom explored, particularly in the context of externalizing behavior outcomes. Notably, there is a consistent positive effect of engaging in acts of kindness on individual wellbeing (Curry et al., 2018), though to our knowledge the benefits of these types of interventions for externalizing behaviors such as aggression have yet to be evaluated. Given the steep negative impacts that aggressive behavior can have on adolescents (including associations with increased substance use and lower academic achievement) (Doran et al., 2012) as well as the adults they become (Moffitt et al., 2002), the findings regarding potential moderators of these behaviors may inform public policy as well as clinical practice. If epidemiological evidence continues to document disproportionate effects of the COVID-19 pandemic on specific populations, preventive criminal justice policies that focus on mitigating these disparities within these communities may have substantial effects on long-term justice system involvement. Importantly, it has been found that Latinx/Hispanic youth may display distinct trajectories of aggressive behaviors when compared to other adolescents (Reingle et al., 2012), which underscores the utility of the current study’s findings in identifying uniquely effective strategies for a group of adolescents who may have similarly unique needs.

Giving social support mitigated the association between the impact of the pandemic and both reactive and proactive aggression in this sample, such that among youth who reported giving low social support, COVID-19 impact was associated with more proactive and reactive aggression. This association was not present among youth who reported giving average or high social support. There is strong evidence that social support buffers against various types of stressors, including illness, caregiving, and natural disasters (Kaniasty, 2020; Schiller et al., 2021; Usta, 2012), and that provision of support to others may be particularly important for wellbeing (Brown & Ryan, 2003; Chen et al., 2021; Inagaki & Orehek, 2017; Schwartz et al., 2003). In this sample of adolescents, giving social support may have served as a form of behavioral activation, leading to a sense of control during a pandemic that has been characterized by significant unpredictability and uncontrollability. It is important to note that the measure of social support used in the present study did not specify a timeframe, thus it is unknown whether participants were reporting on their provision of social support during the pandemic, or during times that preceded the pandemic’s onset as well. Making this distinction in future research would inform our understanding of whether increasing adolescent engagement in social support provision only mitigates aggressive behaviors in the context of current, ongoing stress or could be leveraged for prevention in the context of future stressors as well.

Our finding that adolescents with reports of low expressive suppression had a stronger association between COVID-19 impact and reactive aggression was unexpected as well as inconsistent with past research. While previous pre-pandemic studies have found a positive association between expressive suppression and externalizing behavioral problems (Flouri & Mavroveli, 2013; Kokkinos et al., 2019; Sullivan et al., 2010), our contradictory findings suggest that this may not be the case among predominantly Latinx/Hispanic youth, who are traditionally underrepresented in psychiatric research. One potential reason for this discrepancy may be the distinction between collectivist and individualist cultural values. While expressive suppression tends to be a risk factor in individualistic cultural contexts (Hofstede, 2001), the same may not be the case within collectivist cultures (Markus & Kitayama, 1991), which includes Latinx/Hispanic populations. Future studies interested in whether individual differences in expressive suppression are differentially linked to psychiatric symptoms in different populations will need to assess individualism/collectivism as well as other cultural values which were not measured in this study. Further, there is evidence that within relatively collectivist groups, suppression of positive emotions but not negative emotions was associated with poorer psychological well-being specifically among Mexican American individuals but not Chinese American individuals (Su et al., 2015). Thus, interrogation of this finding for different emotion valences, cultural values, and the social contexts in which emotions occur (e.g., family interactions, school, peer relationships) is necessary to elucidate culturally-sensitive intervention targets that may decrease risk for aggression in the context of a prolonged stressor.

The results of this study should be considered in the context of their limitations. First, the study was cross-sectional and no inferences about directionality can be made. For example, it is possible that youth who were experiencing high levels of psychiatric symptoms before the pandemic reported more COVID-19 events and concerns. In this case, the results may also be relevant to mitigating additional distress among individuals with psychiatric symptoms during future stressors that are similar to the COVID-19 pandemic. This study also focused on psychiatric outcomes that are common during adolescence, but did not include any measures of substance use which would have been informative given that substance use prevention is an important domain of programming for which many of these adolescents had been referred. Another limitation to consider when contextualizing these findings is that our hypotheses were largely based on studies conducted earlier in the pandemic (e.g., Kuhlman et al., 2021), whereas data for the current study were collected from April 2021 to April 2022. The ways adolescents' lives have been impacted by the COVID-19 pandemic have evolved over time; participants in the current study reported a higher number of COVID-19 events ( $M = 6.16 \pm 1.30$ ) than participants who

completed the survey in summer 2020 ( $M = 0.97 \pm 0.75$ ), likely due to the prolonged window of exposure, allowing more COVID-19 related events to occur. The role of various risk and protective factors in the relationship between COVID-19 impact and adolescent mental health may change over time as well. Likewise, the present study utilized a measure of COVID-19 impact which limited opportunities to distinguish between types of COVID-19 impact (i.e., concerns about illness/death, financial instability, changes to schooling). Additionally, some of the psychosocial resources measured in this study showed lower internal reliability in our sample (e.g., optimism, affiliative humor) than other published adolescent samples (Kuhlman et al., 2021), which may have influenced our results. The null results reported in models testing these moderators should be interpreted with caution. Despite these limitations, the present analysis provides insight into the mental health of a community sample of at-risk adolescents in the context of the COVID-19 pandemic as well as the psychosocial resources that may mitigate their risk for further psychiatric distress. As this pandemic continues to impact the lives of adolescents during a formative period of their development, consideration of these processes in minoritized populations, who are critically underrepresented in psychiatric research, is needed to inform subsequent research on risk and resilience, clinical practice, and policy.

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## Compliance with Ethical Standards

**Ethical Approval** All procedures were approved by the institutional review board at the University of California Irvine.

**Informed consent** All parents provided written informed consent and youth provided written informed assent prior to completing the survey.

**Conflict of Interests** The authors have no relevant financial or non-financial conflicts of interest to disclose.

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