JOURNAL OF
Research on Adolescence

Society for Research on Adolescence
www.s-r-a.org

JOURNAL OF RESEARCH ON ADOLESCENCE, 31(3), 546–559

Risk and Protective Factors for Changes in Adolescent Psychosocial Adjustment During COVID-19

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The current study examined (1) changes in psychosocial adjustment among adolescents completing two surveys before COVID-19 and those completing the final survey during COVID-19 and (2) related risk/protective factors. Participants were 208 US adolescents (M_{age} = 15.09, *SD* = 0.50, 48.8% female, 86.1% White; 40.9% COVID group) who completed longitudinal surveys assessing psychosocial adjustment and related risk/protective factors (e.g., emotion regulation, well-being pursuits). Only adolescents completing Wave 3 during COVID-19 experienced increases in depressive symptoms, negative affect, and isolation and decreases in positive affect and friendship. Several variables served as risk (i.e., dampening) and protective (i.e., eudaimonic and hedonic motives) factors of these changes. Findings highlight the range of factors that are distinctly associated with negative changes in adolescent adjustment during COVID-19.

Key words: COVID-19 – adolescence – psychosocial adjustment – risk factors – protective factors – longitudinal

COVID-19 was characterized as a global pandemic by the World Health Organization (WHO) on March 11, 2020, and by the end of March 2020, more than half of US states mandated stay-at-home orders to prevent the spread of the virus. During this time, strict public health measures were put in place, such as social quarantining. This physical isolation combined with economic instability, fear of infection, and stress surrounding the uncertainty of the future has had a profound impact on psychosocial outcomes, making research in this area a top priority (Holmes et al., 2020). Although potentially impactful for all individuals, the effects of pandemic-related stress may be heightened for adolescents due to their increased desire for autonomy and peer connection (Brown & Larson, 2009), which may be hindered when forced to remain home. Additionally, school closures led to reduced access to mental health services, potentially contributing to increased mental health problems (Golberstein, Wen, & Miller, 2020). Despite a recent surge of research indicating difficulties in psychosocial development among adolescents since the onset of COVID-19, there has been limited longitudinal research examining changes in these difficulties over time (Ellis, Dumas, & Forbes, 2020; Orgilés, Morales, Delvecchio, Mazzeschi, & Espada, 2020) and research is just emerging on risk and protective factors of such difficulties (e.g., Magson et al., 2021). Thus, the current study examined changes in emotional and social adjustment from before to during COVID-19 among a sample of US adolescents.

We investigated the role of adolescents' regulatory motives and behaviors that may help to decrease negative affect or increase positive affect and well-being. These data are needed to equip practitioners in their efforts to develop effective interventions by targeting these regulatory motives and strategies that could promote teens' psychosocial health during periods of societal stress. Although some regulatory behaviors are seen as more adaptive than others, the fallacy of uniform efficacy suggests that no one strategy or regulatory motive will always be effective or adaptive across every context (Bonanno & Burton, 2013). This concept is in line with theoretical frameworks on situationism or person X situation interactions that stress the importance of considering people's behaviors in context (e.g., Bowers, 1973). Thus, given the magnitude of the pandemic as a situational milieu that may cause elevated stress and prevent opportunities for positive affect, growth, and goal-directed behaviors, our investigation into how teens' regulatory approaches predict psychosocial functioning is critical during this novel time.

This work was supported by the US National Institute of Child Health and Human Development (1 R15 HD078920-01A1) award to the last author (Gentzler).

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© 2021 Society for Research on Adolescence
DOI: 10.1111/jora.12667

COVID-19 and Adolescents' Psychosocial Adjustment

Psychological adjustment. Growing research suggests that there is a great deal of variability in adolescents' functioning during the pandemic, with some struggling and others doing well and on par with pre-COVID time. For example, Canadian adolescents reporting more COVID-related stress also reported more depressive symptoms (Ellis et al., 2020). High rates of anxiety symptoms were also found among Italian teens (Smirni, Lavanco, & Smirni, 2020) and among Australian teens relative to before COVID-19 (Magson et al., 2021). Higher levels of psychological distress and lower levels of well-being (i.e., happiness and positive emotions) have also been reported using ecological momentary assessments (EMA) in a sample of adolescents in Australia after physical distancing policies were implemented (Munasinghe et al., 2020). Perceived life satisfaction was found to decrease over a time frame of two months into the pandemic among Australian teens (Magson et al., 2021). Overall, the pandemic has (not surprisingly) presented several psychological challenges for adolescents.

Despite noted decrements in well-being and increased symptoms of affective disorders, there is also evidence that some adolescents have comparable functioning to before COVID-19. For instance, a study using EMA with adolescents from the Netherlands indicated that teens' levels of negative and positive affect did not significantly change from pre-COVID times (Janssen et al., 2020). Additionally, researchers have posited that some youth may find relief and improved well-being during the pandemic due to changes in routine that reduce school or social stress (Dvorsky, Breaux, & Becker, 2020). Given the potential for variability, it is important to empirically examine why and how some teens are affected more than others.

Social adjustment. The impact of COVID-19 on adolescent friendships is unclear. For instance, within a sample of US adolescents, person-centered analyses found that education-focused groups (i.e., adolescents devoting twice the amount of time toward educational activities than media use, social interactions, and civic engagement activities) reported lower friend support, whereas media-user groups (i.e., adolescents engaging in greater screen time across media sources, such as watching movies, playing video games, and social media) reported greater friend support (Wray-Lake, Wilf, Kwan, & Oosterhoff, 2020). Among Canadian teens, greater COVID-19-related stress was associated with greater time spent with friends (i.e., chatting and video calls; Ellis et al., 2020). In studies examining indicators of loneliness, COVID-19 stress predicted greater perceived loneliness among Canadian teens (Ellis et al., 2020) and greater isolation among US teens (Sibley et al., 2021), but another study with Peruvian adolescents found no change in loneliness from week 6 to 11 of lockdown (Magis-Weinberg, Gys, Berger, Domoff, & Dahl, 2021). Because very limited research has examined change in social indicators across time or groups, our focus on multiple aspects of loneliness (i.e., friendships, isolation) would add to this existing literature.

Risk and Protective Factors

The concept of resilience is relevant to explain how under conditions of high stress or threat, some people appear to be well-functioning despite the threat (Masten, 2001). Although resilience occurs through multiple systems and processes (Ungar, 2006), research has highlighted the significance of internal attributes (i.e., abilities, motives, and values) in understanding human behavior (Ungar, 2006). For example, it has been suggested that the ability to effectively regulate positive (Tugade & Fredrickson, 2004) and negative emotions (Troy & Mauss, 2011) is crucial for the promotion of resilience and protection against stressors. There is no doubt that facing adversity or stressors, such as COVID-19, can be an emotional experience. For example, a meta-analysis on the psychological impacts of quarantining in various situations found that quarantined individuals were more likely to report lower mood, greater emotional disturbances and exhaustion, higher irritability, and more negative emotions such as anger, sadness, confusion, fear, and grief (compared to nonquarantining individuals; Brooks et al., 2020). Likewise, both hedonic and eudaimonic well-being are closely tied to resilience (Di Fabio & Palazzeschi, 2015). For example, there was a positive relationship between being able to see oneself as growing and feeling more self-satisfied (two components of eudaimonic well-being) and resilience in middle and late adolescence (Sagone & De Caroli, 2014). It is crucial to understand the ability of these individual internal attributes to mitigate the effects that COVID-19 has had on adolescents.

Protective factors would allow people to thrive in spite of stress and would therefore show moderating stress-buffering effects, whereas risk factors

would exacerbate the impact of the stressor (Gutman, Sameroff, & Eccles, 2002). In contrast, promotive factors appear as main effects that positively impact people regardless of risk (Gutman et al., 2002). As an example, Magson et al. (2021) found that feeling more socially connected was protective against higher depressive and anxious symptoms and lower life satisfaction among Australian adolescents. However, very little is known about additional protective or risk factors during the unprecedented conditions of COVID-19 (Dvorsky et al., 2020). Due to the potential for elevated negative emotions and decreased positive emotions, we focus on three types of regulatory motives and strategies that should help teens lessen negative emotions and generate positive emotions. Specifically, effective ways to regulate negative emotions (i.e., cognitive reappraisal) and positive emotions (i.e., savoring) and the pursuit of well-being (i.e., hedonic and eudaimonic motives) have been shown to act as protective factors in other contexts (e.g., low socioeconomic status (SES), high stress or adversity, after an earthquake; Bijttebier et al., 2012; Ryff, 2014; Troy & Mauss, 2011). Moreover, in line with positive psychology and broaden and build theory (Fredrickson, 2001), while reducing symptoms of disorders such as depression is critical, generating positive emotions and enhancing well-being is also essential and can foster resilience and downstream salubrious effects on health and relationships.

Negative emotion regulation. As conditions during COVID-19 (e.g., lack of in-person interactions with friends, distance learning) may increase the likelihood of negative emotions (Munasinghe et al., 2020), the ability to decrease or better tolerate negative affect can be protective against poorer emotional or social health. Emotion regulation is frequently defined as "the processes by which individuals influence which emotions they have, when they have, and how they experience and express such emotions" (Gross, 1998, p. 275). Despite problems with classifying emotion regulation strategies as solely effective or ineffective and adaptive or maladaptive (Bonanno & Burton, 2013), some strategies do show relatively consistent patterns. Based on the Process Model (Gross, 1998), emotion regulation can occur at different points in time (before or after the emotion is generated) and across modality, including attentional deployment (e.g., distraction), cognitive change (e.g., reappraisal), and response modulation (e.g., suppression). Reappraisal (i.e., changing the way one thinks about a situation to change their emotional response) and suppression (i.e., purposefully minimizing emotional expression or experience; Gross & John, 2003) are two of the most well-researched ways of regulating negative emotions. Reappraisal, an antecedent-focused strategy, is often considered effective in reducing negative affect (Gross & John, 2003; Webb, Miles, & Sheeran, 2012) because the individuals modify how they think about the situation, which alters the felt emotions. In contrast, suppression of emotion expressions is a response-focused strategy that is often ineffective in reducing negative affect (Gross, 1998) and considered maladaptive given its links to problematic outcomes (e.g., fewer positive relationships; Gross & John, 2003).

Limited research on emotion regulation during COVID-19 indicates that maladaptive emotion regulation strategies (e.g., rumination, catastrophizing) relate to more anxiety symptoms, whereas adaptive strategies (e.g., positive reappraisal, acceptance) relate to less anxiety symptoms among Spanish adults (Muñoz-Navarro, Malonda, Llorca-Mestre, Cano-Vindel, & Fernández-Berrocal, 2021) and posttraumatic stress symptoms among Chinese adults (Jiang, Nan, Lv, & Yang, 2020). A study with US youth found that more awareness and acceptance of negative emotions served as protective factors for teens with ADHD (Breaux et al., 2021). Other research also suggests that effective negative affect regulation buffers the influence of negative experiences (e.g., adverse life events) on adolescents' psychosocial outcomes, including depressive symptoms (e.g., Boyes, Hasking, & Martin, 2016). Taken together, prior research suggests that reappraisal could protect teens from elevated depressive symptoms and decrements in both friendships and well-being, whereas suppression of emotions may worsen these outcomes during the pandemic. In line with the fallacy of uniform efficacy, when situations are out of people's control (like the pandemic with government regulations changing frequently), reappraisal may be especially helpful (Troy, Shallcross, & Mauss, 2013) and contribute to teens' resiliency from COVID-19 stressors. Alternatively, it is also possible that reappraisal and suppression may have these effects among all youth (serving as promotive or vulnerability factors), or that these regulatory strategies are less impactful during this uniquely stressful time.

Positive emotion regulation. Although research on emotion regulation has predominantly focused on negative affect, theoretical (e.g., broaden-and-

build theory; Fredrickson, 2001) and empirical evidence suggests that positive emotions play a role in building psychological resilience to stressful events (Tugade & Fredrickson, 2004). Savoring (i.e., strategies that upregulate or maintain positive affect; Bryant, 2003) is considered adaptive and is associated with more happiness and life satisfaction and less depression (Gentzler, Palmer, & Ramsey, 2016; Quoidbach, Berry, Hansenne, & Mikolajczak, 2010). Dampening (i.e., strategies that reduce the intensity and duration of positive affect; Wood, Heimpel, & Michela, 2003) is maladaptive and is associated with greater depressive symptoms (Raval, Luebbe, & Sathiyasseelan, 2019) and less life satisfaction and happiness (Gentzler et al., 2016). This study is the first to investigate whether adolescents' savoring is protective against negative outcomes (or promotes positive emotions) and dampening is a risk for worse emotional outcomes during COVID-19. Savoring as a protective factor is plausible given that teens are likely operating at high levels of negative affect and low positive affect during the pandemic (Munasinghe et al., 2020), and a study found that savoring was protective against higher depressive symptoms among highly stressed youth (Bijttebier et al., 2012).

Motives to pursue well-being. Well-being is often characterized as including two universal components, with hedonia stemming from experiencing more pleasant than unpleasant emotions, and eudaimonia comprising self-realization and living up to one's potential (Deci & Ryan, 2008). Importantly, motivation to pursue hedonia increases well-being in the short-term, whereas motivation to pursue eudaimonia has more cumulative and enduring positive effects on well-being and life satisfaction (Huta & Ryan, 2010). Limited research on adolescents indicates that motivation to pursue eudaimonia is associated with many positive outcomes, including greater life satisfaction and closer friendships (Gentzler, DeLong, Palmer, & Huta, 2021), whereas pursuit of hedonia is mixed and linked to both positive and negative socioemotional correlates (Gentzler et al., 2021; Keyes, 2006). However, research on the pursuit of eudaimonia and hedonia during COVID-19 is limited and has focused primarily on the predictors (e.g., coping strategies, social distancing) of well-being (Munasinghe et al., 2020; Pigaiani et al., 2020). Consistent with the fallacy of uniform efficacy, the unique constraints (e.g., lack of traditional schooling and extracurricular activities, interfering with eudaimonic goals like achievement and growth) and stressors (e.g., intense health concerns about close others or communities) during the pandemic may result in eudaimonic motives not having the same benefits as during more typical times whereas hedonic motives focused on short-term pleasure may be more helpful. Thus, it is imperative to understand if these universal pursuits of well-being may have unusual associations with socioemotional well-being during the pandemic (protective or risk factors) or whether they serve as more general promotive factors across all youth.

The Present Study

Taken together, the above literature provides consistent evidence that the COVID-19 crisis may be having a significant impact on the psychosocial adjustment of adolescents. However, the previous literature is limited in several ways: (1) most research has relied on respondents indicating the perceived impact of COVID-19 on their adjustment, rather than utilizing longitudinal data assessing *change* in adjustment from before to during the pandemic, (2) to date, research has not examined change in a broad range of emotional and social factors, and (3) little research has investigated the specific preexisting risk and protective factors for teens' psychosocial adjustment, and no research to date has focused on ability to upregulate positive emotions and pursue well-being. To address these gaps, the present study compared change in psychosocial adjustment from Wave 2 to Wave 3 among a group of adolescents who completed Wave 3 before the pandemic to a group of adolescents who completed Wave 3 during the pandemic. The first goal of the study was to examine the impact of COVID-19 on changes in a range of emotional (depression, negative affect, positive affect, life satisfaction) and social (friendship, isolation) outcomes. The second goal was to investigate regulatory motives and behaviors (reappraisal, suppression, savoring, dampening, motives to pursue eudaimonic and hedonic well-being) as risk or protective factors for change in pandemic-related adjustment.

METHODS

Research Design and Sample

The data for the current study were from a larger study on 299 adolescents surveyed across three waves. To be included in the current study, participants had to complete surveys at Wave 3 (n = 241)

so that they could be categorized as participating either before or during COVID-19. Data collection for the third wave of the study took place from March 26, 2019, to August 23, 2020. In order to capture participants' experiences as a result of COVID-19, adolescents who completed their Wave 3 survey prior to March 13, 2020, were categorized as completing the Wave 3 survey before COVID-19 (n = 123). Adolescents who completed their survey on or after April 13, 2020 (i.e., ~1 month after COVID-19 lockdown orders), were categorized as completing the Wave 3 survey during COVID-19 (n = 85). Adolescents who completed their Wave 3 survey between the onset of COVID-19 restrictions (March 13, 2020) and April 12, 2020, were excluded from analyses, resulting in a final analytic sample of 208 adolescents ages 14–16 years old (M = 15.09, SD = 0.50; 48.8% female) from the mid-Atlantic southeast region of the United States.

In the larger study, adolescents completed self-report surveys across three time points over the course of 1 year. Adolescents were recruited locally using email listservs, social media, and directly from their high schools in partnership with school staff. Parental consent and youth assent were obtained prior to participation. Participants completed the baseline survey on paper at either their home, the university research laboratory, their high school, or a public library. Participants completed Wave 2 (6 months after completing Wave 1; M = 7.05 months, SD = 0.99) and Wave 3 (6 months after completing Wave 2; M = 6.12 months, SD = 1.81) surveys at school or home and either on paper or online. Participants were compensated $20 after completing each survey and received an additional $20 if they completed all three waves.

Adolescents self-identified as White (86.1%), Black/African American (3.4%), Hispanic/Latinx (1.9%), Asian (2.9%), Native American (0.5%), or more than one race (4.3%). Using the MacArthur Scale of Subjective Social Status ("At the top of the ladder are people who are the best off, with the most money/education, and best jobs. At the bottom are people who are the worst off, with the least money/education, and worst jobs"), participants reported an average of 6.30 (SD = 1.37) with 1 representing the lowest social status and 10 representing the highest social status (Goodman et al., 2001).

To compare adolescents who completed Wave 2 or Wave 3 versus those who did not, we conducted t tests and chi-square analyses. There were no differences based on adolescents' gender, age, or the self-reported SES ladder. However, race/ethnicity (dichotomized as white or minority) was related to rates of Wave 2 and Wave 3 completion: 17% of White teens did not complete Wave 2 compared to 30% of racial or ethnic minority teens, $\chi^2 = 4.53$, $p = .033$, and 15.4% of White teens did not complete Wave 3 compared to 38% of minority teens, $\chi^2 = 13.71$, $p < .001$. Depressive symptoms, positive affect, negative affect, friendship, and isolation were not related to attrition. However, teens who did not complete Wave 3 reported lower life satisfaction at Wave 1 (M = 4.24, SD = 1.22) compared to teens who completed Wave 3, (M = 4.69, SD = 0.98), t (74.05) = −2.62, p = .01. No affective risk or protective factors (hedonic and eudaimonic motives, reappraisal, suppression, savoring, dampening) were related to Wave 2 or Wave 3 completion.

Emotional and Social Outcomes

Depressive symptoms. Adolescents reported on their depressive symptoms at Wave 2 and Wave 3 using the Child Depression Inventory (CDI-2; Kovacs, 2011; $\alpha_{\text{Wave 2-3}}$ = .90–.91). The CDI-2 is a 27-item self-report questionnaire that assesses affective, behavioral, and cognitive symptoms of depression in children and adolescents (7–17 years). Items on the CDI-2 were scored on a 3-point Likert scale, and participants were asked to choose between three statements ranging in severity. Each set of three statements represents a symptom across the previous 2 weeks (e.g., "I am sad once in a while," "I am sad many times," and "I am sad all of the time"). Items were summed such that higher scores represented greater depressive symptoms.

Positive and negative affect. Positive and negative affect were assessed at Wave 2 and Wave 3 using the Positive and Negative Affect Schedule—Short Form (PANAS-SF; Laurent et al., 1999). This 10-item questionnaire assesses five positive (joyful, cheerful, happy, lively, and proud) and five negative (miserable, mad, afraid, scared, and sad) emotions. Participants rated items on a 9-point Likert scale ranging from 1 (*Very slightly or not at all*) to 9 (*Extremely*) based on the extent to which they experienced that particular emotion within the past month. Positive ($\alpha_{\text{Wave 2-3}}$ = .91–.92) and negative ($\alpha_{\text{Wave 2-3}}$ = .84–.85) items were averaged such that higher scores represented higher levels of positive or negative affect.

Life satisfaction. Life satisfaction was assessed at Wave 2 and Wave 3 using the Students' Life

Satisfaction Scale (SLSS; Huebner, 1991; $\alpha_{\text{Wave 2-3}}$ = .85–.91). Questions on this 5-item scale (e.g., "My life is going well" and "My life is better than most kids") were scored on a 6-point Likert scale ranging from 1 (*Strongly disagree*) to 6 (*Strongly agree*). Items were averaged such that higher scores represented higher satisfaction with life.

Friendship and isolation. Friendship and isolation were assessed at Wave 2 and Wave 3 using Friendship and Isolation subscales of the Perth Aloneness scale (PAL; Houghton et al., 2014). Participants responded to each 6-item scale, friendship (e.g., "My friends will stand by me in almost any difficulty"; $\alpha_{\text{Wave 2-3}}$ = .93) and isolation (e.g., "No one cares much about me"; $\alpha_{\text{Wave 2-3}}$ = .87–.89) using a 6-point Likert scale ranging from 1 (*Never*) to 6 (*Always*). Items were averaged as separate scores, such that a higher friendship score represented higher feelings of friendships and a higher isolation score represented more feelings of isolation.

Risk and Protective Factors

Reappraisal and suppression of negative affect. During Wave 1, reappraisal and suppression were assessed using the Emotion Regulation Questionnaire (ERQ; Gross & John, 2003). In this 10-item scale, participants were presented with statements assessing reappraisal (e.g., "When I want to feel happier, I think about something different"; six items; α = .81) and suppression (e.g., "I keep my feelings to myself"; four items; α = .67) strategies. The ERQ is scored on a scale of 1 (*Strongly disagree*) to 7 (*Strongly agree*). Scores for each subscale are averaged, such that higher scores indicated more reappraisal and suppression of negative affect.

Savoring and dampening of positive affect. During Wave 1, dampening and savoring of positive affect were assessed using the Positive Affect and Responses Survey (PAARS; Moran & Gentzler, 2020). Participants reported on how likely they would be to engage in various dampening and savoring activities when feeling happy. The PAARS is scored on a scale of 1 (*Not at all likely*) to 5 (*Very likely*). Items for the 5-item dampening (e.g., "Not think about your good feelings much"; α = .75) and 11-item savoring (e.g., "Tell a close friend or family member how happy you are"; α = .83) subscales were averaged so that higher scores reflected more dampening and savoring.

Eudaimonic and hedonic well-being motives. During Wave 1, eudaimonic and hedonic motives were assessed using the Hedonic and Eudaimonic Motives for Activities scale (HEMA; Huta & Ryan, 2010). Participants were asked to report to what extent they approach activities with various hedonic (e.g., "Seek Pleasure") and eudaimonic (e.g., "Seek to develop a skill, learn or gain insight into something") motives using a 1 (*Not at all*) to 7 (*Very Much*) scale. Scores for each subscale were averaged such that higher scores represented stronger hedonic (α = .67; five items) and eudaimonic (α = .77; four items) motives.

Analytic Plan

Using Mplus 8.5 (Muthen & Muthen, 1998-2017), we first examined latent change score (LCS) models in which each of the six outcomes (i.e., depression, negative affect, positive affect, life satisfaction, friendship, and isolation) were specified to examine change in psychosocial outcomes from Wave 2 to Wave 3 among the full sample. Standard model fit criteria were used, including chi-square tests, comparative fit index (CFI), Tucker–Lewis Index (TLI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). Model fit was considered adequate with values lower than 3.00 for χ^2/df, values of .90 or higher for CFI and TLI, and values of .08 or lower for RMSEA and SRMR (Kline, 2005).

To examine moderation by COVID-19, we conducted multigroup models with COVID-19 as a categorical grouping variable (i.e., completed Wave 3 survey before COVID versus during COVID). We first estimated an unconstrained model, in which the LCS variables were allowed to vary across COVID-19 groups. We compared this model to a constrained model, in which LCS variables were constrained to be equal across COVID-19 groups. Following the approach outlined by Cheung and Rensvold (2002), change in CFI of .01 or greater was used to evaluate significant differences in overall model comparisons. Modification indices were used to determine parameter differences, and parameters were considered significantly different at $p < .001$ (Little, 2013). After determining COVID-19 differences in LCS variables, all risk and protective factors (i.e., adolescent eudaimonic/hedonic well-being, dampening, savoring, reappraisal, suppression) assessed at Wave 1 were entered into the multiple group model simultaneously as predictors of the LCSs while controlling for adolescent SES, gender, and race. COVID-19 group differences in

parameter estimates were evaluated as described above. Specifically, COVID-19 group differences in parameter estimates were evaluated for the overall model with all predictors simultaneously predicting each outcome. Modification indices were examined to determine which specific associations among predictors and the outcome varied for non-COVID-19 versus during COVID-19 participants.

Missing data were estimated using full-information maximum likelihood. A post hoc power analysis was conducted using a Monte Carlo-based method in R using RAMPath in order to determine whether we had adequate power to conduct the proposed analyses with a sample size of 208 with alpha set at .05 (Zhang & Liu, 2018). Based on the power analysis, we had power = .70 to detect medium effects, suggesting that we were slightly underpowered, as power >.80 is considered ideal (Zhang & Liu, 2018).

RESULTS

COVID-19 Differences in Change in Psychosocial Outcomes

Descriptive statistics and bivariate correlations for key study variables can be found in Table 1. The multivariate LCS model with all outcome variables included simultaneously for parsimony provided a good fit to the data, $\chi^2/df = 1.86$, RMSEA = .07, CFI = .99, TLI = .95, SRMR = .06. The unconditional LCS model was then estimated in a multiple group model with COVID-19 as a grouping variable. Comparing unconstrained and constrained models revealed evidence of moderation by COVID-19 in depression, negative affect, positive affect, friendship, and isolation (ΔCFI = .03). Modifications showed that the LCS needed to be freed for depression, negative affect, positive affect, friendship, and isolation (MIs > 10; ΔCFI < .01) indicating that adolescents who completed Wave 3 during COVID-19 reported greater increases in depression, negative affect, and isolation and greater decreases in positive affect and friendship from Wave 2 to Wave 3 compared to adolescents who completed Wave 3 before COVID-19 (Table 2).

Predictors of Psychosocial Change

Next, all risk and protective factors were added to the multiple group models as predictors of LCSs while controlling for adolescent SES, gender, and race. Model comparisons showed significant differences for five of the six psychosocial outcomes: depression, negative affect, positive affect, isolation, and life satisfaction (Table 3). Out of the six predictors of interest, four (all except for reappraisal and suppression) predicted at least one outcome. With regard to positive affect regulation, modifications showed that the associations between dampening with depression, positive affect, and life satisfaction needed to be freed, indicating that dampening was associated with greater increases in depression and greater decreases in positive affect and life satisfaction for COVID-19 participants only. With regard to well-being motives, modifications indicated that the association between eudaimonic motives and negative affect needed to be freed and the association between hedonic motives and isolation needed to be freed. Findings suggested that eudaimonic motives were associated with greater decreases in negative affect, whereas hedonic motives were associated with greater decreases in isolation among COVID-19 participants only. Taken together, dampening served as a risk factor, placing adolescents at greater risk for experiencing increases in negative (depressive symptoms) and decreases in positive (positive affect, life satisfaction) psychosocial outcomes during COVID-19, whereas eudaimonic and hedonic motives served as protective factors, placing adolescents at greater likelihood for experiencing decreases in negative (negative affect and isolation) psychosocial outcomes during COVID-19.

Finally, in terms of main effects across both COVID-19 and non-COVID-19 groups, dampening was associated with greater increases in negative affect and savoring was associated with greater increases in positive affect across the sample. Additionally, sociodemographic factors were only significant for the negative affect model, with higher SES being associated with greater decreases in negative affect and identifying as female being associated with greater increases in negative affect among all adolescents (Table 3).

DISCUSSION

This study provides new evidence on how preexisting regulatory goals and strategies predict adolescents' psychosocial adjustment during the pandemic. A strength of this study's design is its assessment of risk and promotive or protective factors 1 year or more prior to the pandemic, as well as the ability to make comparisons within the group completing Wave 3 surveys during COVID-19 to the group completing Wave 3 surveys before COVID-19. Results indicated that dampening

TABLE 1
Descriptive Statistics and Bivariate Correlations Among Key Study Variables

	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*
1. Reappraisal	–																				
2. Suppression	.09	–																			
3. Dampening	**−.18**	**.43**	–																		
4. Savoring	**.27**	**−.24**	**−.20**	–																	
5. Eudaimonic	**.36**	−.05	**−.16**	**.27**	–																
6. Hedonic	**.20**	−.05	**−.14**	**.19**	**.41**	–															
7. W2 Depression	**−.22**	**.23**	**.29**	**−.21**	**−.25**	**−.22**	–														
8. W3 Depression	**−.20**	**.29**	**.39**	**−.22**	**−.29**	**−.27**	**.78**	–													
9. W2 Neg Affect	−.03	.13	.09	−.03	−.10	−.11	**.67**	**.54**	–												
10. W3 Neg Affect	**.16**	.13	**.34**	−.07	**−.22**	**−.15**	**.62**	**.73**	**.58**	–											
11. W2 Pos Affect	**.20**	**−.22**	**−.25**	**.34**	**.31**	.15	**−.67**	**−.48**	**−.39**	**−.35**	–										
12. W3 Pos Affect	**.21**	**−.17**	**−.38**	**.34**	**.39**	**.26**	**−.57**	**−.68**	**−.29**	**−.48**	**.58**	–									
13. W2 Friendship	.10	**−.17**	**−.16**	**.19**	.04	.07	**−.40**	**−.29**	**−.19**	**−.21**	**.39**	**.27**	–								
14. W3 Friendship	.14	−.13	**−.20**	**.25**	**.17**	.12	**−.47**	**−.50**	**−.24**	**−.31**	**.51**	**.61**	**.60**	–							
15. W2 Isolation	−.14	**.18**	.13	−.14	−.12	**−.15**	**.48**	**.41**	**.27**	**.36**	**−.27**	**−.29**	**−.63**	**−.46**	–						
16. W3 Isolation	−.04	**.16**	**.36**	−.09	−.07	**−.16**	**.47**	**.57**	**.30**	**.52**	**−.24**	**−.45**	**−.44**	**−.59**	**.63**	–					
17. W2 Life Sat	**.24**	**−.20**	**−.20**	**.28**	**.29**	**.20**	**−.74**	**−.57**	**−.57**	**−.46**	**.70**	**.47**	**.36**	**.36**	**−.33**	**−.24**	–				
18. W3 Life Sat	**.26**	**−.16**	**−.33**	**.29**	**.38**	**.21**	**−.61**	**−.76**	**−.44**	**−.61**	**.46**	**.73**	**.25**	**.49**	**−.35**	**−.48**	**.61**	–			
19. SES Ladder	.01	**−.20**	−.11	**.18**	−.02	.09	**−.24**	**−.29**	**−.24**	**−.14**	**.24**	**.24**	**.17**	**.17**	−.05	−.13	**.32**	**.32**	–		
20. Female	.10	−.05	.02	−.05	−.02	**.18**	**.29**	**.25**	**−.34**	**−.24**	.06	.07	.05	−.02	**−.27**	−.11	**.15**	.08	.10	–	
21. White	.02	−.05	.01	**.16**	−.13	.06	−.11	−.09	−.14	.08	.11	.08	.11	.09	−.03	**.14**	.14	.07	**.16**	.01	–
M/N	4.18	3.82	2.19	3.22	5.54	5.15	13.88	13.89	3.23	3.56	6.10	6.05	4.72	4.71	1.65	1.75	4.70	4.65	6.30	101	179
SD/%	1.14	1.27	0.85	0.67	1.01	0.93	8.70	9.16	1.60	1.73	1.68	1.87	1.12	1.07	0.77	0.96	0.94	1.13	1.37	48.8	86.1

Note. Bolded values denote statistical significance. Some variable names have been shortened: Eudaimonic = Eudaimonic Motives; Hedonic = Hedonic Motives; Neg Affect = Negative Affect; Pos Affect = Positive Affect; Life Sat = Life Satisfaction. Female is coded as (0 = male, 1 = female); race is coded as (0 = minority, 1 = White).

TABLE 2
Means and Variances of Psychosocial Outcome Latent Change Scores (LCS) by COVID Status

	Non-COVID (N = *123)*		*During COVID* (N = *85; 40.9%)*	
	Mean	*Variance*	*Mean*	*Variance*
Depression	**.66**	**18.95**	**1.07**	**6.12**
Negative Affect	**.08**	**2.43**	**1.10**	**1.70**
Positive Affect	**−.10**	**2.88**	**-1.04**	**1.77**
Friendship	**−.04**	**1.56**	**-0.21**	**1.43**
Isolation	**−.06**	**1.28**	**0.24**	**1.51**
Life Satisfaction	−.06	1.60	0.09	0.55

Note. Bolded values denote significant differences between non-COVID and during COVID groups on LCSs.

served as a risk and eudaimonic and hedonic motives were protective for multiple outcomes. Comparatively, only savoring and dampening predicted outcomes (i.e., positive affect, negative affect, respectively) for all adolescents similarly, which speaks to the importance of investigating people embedded in situations. The stressful impact of the pandemic was also seen by mean-level increases in depression, negative affect, and isolation and decreases in positive affect and friendship in the COVID group compared to the non-COVID group. Overall, this study contributes important information on how adolescents were faring and factors that placed them at more or less risk for impaired psychosocial adjustment during the pandemic.

Notably, the current findings suggest that regulation of positive, rather than negative affect, had important implications for adolescents' adjustment. First, savoring served as a promotive factor, predicting less of a decrease in positive affect across all adolescents. Although savoring was not especially helpful in the COVID group, this finding is consistent with an earlier study with young adolescents, showing that savoring was associated with sustained positive affect about positive life events (Gentzler, Morey, Palmer, & Yi, 2012). However, savoring did not emerge as protective against elevated depressive symptoms (or any other outcome) like previously found with one type of savoring (positive rumination) for highly stressed youth (Bijttebier, Raes, Vasey, & Feldman, 2012). The benefits of using savoring strategies (e.g., expressing positive emotions or sharing positive events with others) are somewhat dependent on how others react to these expressions or disclosures (e.g., with support and shared enthusiasm; Gable, Reis, Impett, & Asher, 2004). Thus, it is possible there may be important family or peer moderating

TABLE 3
Multigroup Model Estimates of COVID Differences in Associations Among Covariates and Change in Psychosocial Outcomes

	Depression B (SE)	*Negative Affect* B (SE)	*Positive Affect* B (SE)	*Friendship* B (SE)	*Isolation* B (SE)	*Life Satisfaction* B (SE)
Non-COVID						
SES Ladder	−.26 (.18)	**−0.24 (.10)**	.23 (.08)	.01 (.03)	−.03 (.02)	.03 (.03)
Female	−.03 (.48)	**1.02 (.27)**	−.23 (.23)	.10 (.08)	−.09 (.06)	.04 (.07)
White	.50 (.73)	−0.27 (.39)	−.11 (.35)	−.24 (.12)	.16 (.09)	.03 (.11)
Reappraisal	.18 (.22)	−0.03 (.05)	−.01 (.11)	−.02 (.04)	.04 (.03)	−.05 (.04)
Suppression	.09 (.20)	−0.04 (.05)	.01 (.10)	.02 (.03)	−.04 (.02)	.05 (.03)
Dampening	*.36 (.26)*	**0.24 (.07)**	*−.43 (.22)*	−.05 (.05)	.06 (.05)	*−.06 (.07)*
Savoring	.26 (.36)	0.02 (.09)	**.47 (.18)**	.04 (.06)	−.05 (.05)	.02 (.06)
Eudaimonic motives	−.26 (.27)	*−0.10 (.08)*	.21 (.13)	.06 (.05)	.04 (.03)	.07 (.04)
Hedonic motives	−.23 (.27)	−0.04 (.07)	.08 (.14)	.03 (.05)	*−.07 (.05)*	.01 (.04)
During COVID						
SES Ladder	−.26 (.18)	**−0.24 (.10)**	.23 (.08)	.01 (.03)	−.03 (.02)	.03 (.03)
Female	−.03 (.48)	**1.02 (.27)**	−.23 (.23)	.10 (.08)	−.09 (.06)	.04 (.07)
White	.50 (.73)	−0.27 (.39)	−.11 (.35)	−.24 (.12)	.16 (.09)	.03 (.11)
Reappraisal	.18 (.22)	−0.03 (.05)	−.01 (.11)	−.02 (.04)	.04 (.03)	−.05 (.04)
Suppression	.09 (.20)	−0.04 (.05)	*.01 (.10)*	.02 (.03)	−.04 (.02)	.05 (.03)
Dampening	***.76 (.46)***	**0.24 (.07)**	**−.69 (.19)**	−.05 (.05)	.06 (.05)	***−.14 (.06)***
Savoring	.26 (.36)	0.02 (.09)	**.47 (.18)**	.04 (.06)	−.05 (.05)	.02 (.06)
Eudaimonic motives	−.26 (.27)	***−0.26 (.09)***	.21 (.13)	.06 (.05)	.04 (.03)	.07 (.04)
Hedonic motives	−.23 (.27)	−0.04 (.07)	.08 (.14)	.03 (.05)	***−.27 (.07)***	.01 (.04)

Note. Bolded values denote statistical significance at $p < .008$ using Bonferroni's multiple comparison correction. Values in italic values indicate variables are significant predictors of change for the during COVID-19 group but not for non-COVID-19 group.

factors. Dampening was associated with more negative affect across all adolescents. Dampening also predicted greater increases in depression and greater decreases in positive affect and life satisfaction across only the COVID-19 group. This finding is consistent with other studies showing that dampening predicts depression in adults (Raes, Smets, Nelis, & Schoofs, 2012) and youth (Raval et al., 2019). Better understanding risks for depression in teens is critical given that approximately one-third of US girls and one-fifth of US boys were suffering with elevated depressive symptoms prior to the pandemic (Twenge & Joiner, 2020). Neither savoring nor dampening predicted change in social outcomes, suggesting these regulatory strategies are more impactful on teens' affective states than on their perception of their peer relationships. Overall, dampening appeared to be a particularly detrimental regulatory behavior during the pandemic, suggesting that negative thoughts or behaviors that decrease one's positive affect may have pervasive impacts on adolescents' emotional health and undermine their emotional well-being.

Regarding well-being motives, eudaimonic motives were associated with weaker increases in negative affect among adolescents who completed Wave 3 during COVID-19. Although research on eudaimonic well-being motives among adolescents is limited, cross-sectional studies indicate that greater motivation to pursue eudaimonia (e.g., purpose, developing skills) is related to many positive outcomes (e.g., greater life satisfaction, closer friendships) as well as lower levels of depressive symptoms (Gentzler et al., 2021). The present study's finding that eudaimonic motives may protect adolescents against steeper increases in negative emotions during a stressful time therefore advances this limited research. However, counter to prior research (Gentzler et al., 2021), adolescents reporting more eudaimonic motives at Wave 1 were not better off in terms of lower depressive symptoms or isolation levels or more positive affect, life satisfaction, or friendship. It is possible some teens with high eudaimonic motives (e.g., drive to better themselves and their community) may not incur as many benefits if the pandemic interferes with these goals due to online schooling, canceled sports, and extracurricular activities. In contrast, hedonic well-being motives were associated with less of an increase in isolation among adolescents completing their Wave 3 survey during COVID-19. The fact that a protective role of hedonic motives only emerged for adolescents feeling less isolated from friends is noteworthy and consistent with findings that teens' hedonic motives were linked to more frequent positive interpersonal events (but not positive achievement events or other positive outcomes; Gentzler et al., 2021). Being more motivated to have fun and feel good may help teens to mitigate feelings of isolation. However, the nonsignificant findings for positive affect, life satisfaction, friendship quality, and depressive symptoms suggest that more hedonically motivated teens may not benefit more globally, potentially because hedonic motives can impede other useful behaviors such as schoolwork or healthy behaviors.

Interestingly, the regulation of negative affect (i.e., reappraisal, suppression) was not significantly associated with any of the psychosocial outcomes (depressive symptoms, negative affect, positive affect, life satisfaction, friendship, or isolation) as either a risk, promotive, or protective factor. This is surprising and counter to literature suggesting that suppression is associated with lower well-being (e.g., life satisfaction; Gross & John, 2003) and poorer social outcomes (e.g., less close relationships, declines in peer closeness, greater negative reactions from social partners; Butler, Lee, & Gross, 2007; Gross & John, 2003; Srivastava, Tamir, McGonigal, John, & Gross, 2009). Additionally, research suggests that reappraisal is relatively effective at decreasing negative affect (Webb et al., 2012) and is linked to lower levels of psychopathology (Aldao, Nolen-Hoeksema, & Schweizer, 2010). Consistent with situationism (Bowers, 1973) and the fallacy of uniform efficacy (Bonanno & Burton, 2013), it may be that pandemic-related contextual factors affected how adaptive reappraisal or suppression is for some adolescents. As examples, research indicates that reappraisal is less effective in intense situations (Sheppes & Meiran, 2007), which the pandemic could be for some teens, or with more controllable situations (Troy et al., 2013) because it may impede direct coping efforts (e.g., social distancing) to mitigate the threat. Overall, more research is needed on these common regulation strategies and potential moderating factors.

Taken together, findings regarding emotion regulation suggest that adolescents' positive affect regulation strategies have greater implications for their psychosocial adjustment during the pandemic than their negative affect regulation strategies, particularly with regard to psychological outcomes (i.e., depression, positive affect, life satisfaction). Additionally, positive affect regulation strategies appear to be particularly important risk and promotive factors with regard to both positive and

negative affect among all adolescents, as dampening placed all adolescents at risk for increases in negative affect, whereas savoring was associated with increases in positive affect among all adolescents. Findings also highlight the importance of well-being motives, particularly in relation to negative affect and isolation. Thus, identifying ways to promote adolescents' effective regulation of positive affect, as well as promoting adolescents' well-being motives may be imperative for reducing risk for experiencing increases in negative and decreases in positive pandemic-related psychosocial outcomes. Previous research suggests that both regulation of positive affect and well-being motives may be modified in intervention and in turn, associated with less depression and negative affect (Hurley & Kwon, 2012; Tejada-Gallardo, Blasco-Belled, Torreles-Nadal, & Alsinet, 2020). Current findings have implications for understanding which specific emotion regulation strategies and well-being motives to target in interventions with adolescents displaying a range of psychosocial problems. The study also suggests that these related outcomes are not identical and highlight the importance of tailoring interventions to the specific psychosocial difficulties that adolescents are experiencing.

With regard to covariates, our findings suggest that adolescents with lower SES and those who identified as female reported greater increases in negative affect over time. These associations did not depend on the timing of Wave 3 (during the pandemic or not). The findings are consistent with research indicating that adolescent girls report greater negative affect than adolescent boys (Hamama & Hamama-Raz, 2019) and that individuals with higher SES have more financial and economic resources, leading to affective benefits (Ettman et al., 2020).

Limitations and Future Directions

Despite the important contributions of the current study, there are several limitations to be noted. First, the sample was limited by size, as only 85 participants completed the final wave during COVID-19. Thus, although we had adequate power for large or medium effects, our sample size of 208 was underpowered to detect small effects. Future research should use larger samples of adolescents to be sure that any null findings in the current study were not due to limited sample size. Additionally, the current study relied on adolescents' self-report of regulatory goals and strategies and their socioemotional adjustment. Because research suggests that adolescents may underreport negative factors and overreport positive factors due to social desirability (Krumpal, 2011), future research should incorporate other reporters (e.g., parents), as well as observational data. Because the current study utilized LCSs to assess change in psychosocial outcomes from Wave 2 to Wave 3, we were unable to assess within-person change in addition to between-person change in psychosocial outcomes from before to during COVID-19. Future research should utilize more than two waves of data to examine change in psychosocial outcomes as a result of COVID-19 to disaggregate within- from between-person change. Finally, the current study focused on intraindividual emotional risk and protective factors that were expected to impact teens' psychosocial adjustment (in addition to covarying SES, race/ethnicity, and gender). However, because teens' adj ustment also likely depends on a myriad of broader factors, future research should include family- or community-level variables (e.g., parental stress or relationship with teens, family health, school resources) as predictors or moderators (e.g., does teens' reappraisal matter more and savoring matter less when parent-teen relationships are more conflictual?).

Conclusion

As parents and practitioners look for ways to prevent escalation of negative psychosocial outcomes and promote positive adjustment among youth, it is imperative to understand the factors that predict pandemic-related changes in these outcomes. Current findings indicate that not all trajectories of psychosocial functioning change similarly over time. Rather, adolescents demonstrated unique patterns of change across outcomes that were distinctly predicted by specific facets of emotion regulation strategies and well-being pursuits. Thus, interventions might target those at highest risk and target modifiable risk and protective factors, such as discouraging dampening and encouraging savoring and pursuits of eudaimonic and hedonic well-being.

ACKNOWLEDGEMENT

This research was supported by the US National Institute of Child Health and Human Development (1 R15 HD078920-01A1) award to Amy L. Gentzler. We thank all of the adolescents who participated in the study.

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