



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

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



A prospective study of college student depressive symptoms, sense of purpose, and response to a COVID-19 campus shutdown

Kaylin Ratner^{a,*}, Anthony L. Burrow^a, Jane Mendle^a, Patrick L. Hill^b

^a Cornell University, United States of America

^b Washington University in St. Louis, United States of America

ARTICLE INFO

Keywords:
 COVID-19
 Purpose
 Depression
 College students
 Adjustment

ABSTRACT

Individual differences can shape the way major life events are experienced. In this study, we explored the unique and interactive effects of depressive symptoms and sense of purpose on downstream appraisals of a COVID-19 college campus shutdown. Data were from a sample of U.S. college students ($n = 152$) surveyed prior to widespread COVID-19 transmission (Time 1; early fall 2019), and again just after their university closed as a protective measure (Time 2; mid-spring 2020). Depressive symptoms were positively associated, whereas sense of purpose was negatively associated, with cross-sectional reports of social status change due to shutdown. Depressive symptoms at Time 1 positively predicted perceived external control of the situation at Time 2, and sense of purpose at Time 1 positively predicted changes to worldview at Time 2. Purpose and depressive symptoms evidenced high rank-order stability from Time 1 to Time 2. This study represents a rare documentation of college students' feelings and experiences before, and during, a historical moment. The implications of these findings for future research are discussed.

With the suspension of in-person classes in March and April 2020 due to COVID-19, many U.S. college students had to move quickly out of local residencies and adjust to courses online. Amid fears for health and safety, many also said abrupt goodbyes to friends and faculty, and graduated with little-to-no ceremony to mark their achievement (see Correal, 2020). By summer 2020, 74.9% of 18 to 24-years-olds reported experiencing at least one adverse psychological symptom (Czeisler et al., 2020). In this study, we explored how two individual differences related to stress response—depressive symptoms (e.g., Morris et al., 2010) and sense of purpose (e.g., Hill et al., 2018, 2021)—predicted how students appraised their campus shutting down due to COVID-19. Documenting psychological responses, as well as their correlates and predictors, is valuable for describing this historical moment and informing future work on trajectories of recovery from large-scale events.

1. Perceived event characteristics and pandemic response

For college students, a campus shutdown amidst a global pandemic qualifies as a major life event: it has a defined start, upends daily life, and is not easily forgotten (see Luhmann et al., 2014, 2020). However, it is unlikely that students experienced the shutdown uniformly. This is

important, as individual event appraisals can differentially impact psychological outcomes (Dohrenwend, 2000; Lazarus and Folkman, 1984). The Transactional Theory of Stress and Coping (TTSC; Lazarus and Folkman, 1984) suggests that stress and negative outcomes are most likely when situations are deemed threatening (primary appraisal) and resources insufficient for handling the threat (secondary appraisal). Once stress is felt, people can engage in coping strategies to neutralize the threat (e.g., changing the situation, changing perceptions) and monitor effectiveness through ongoing reappraisal. For many years, negative and uncontrollable events became alluring study targets because of a presumed stronger impact on functioning (e.g., Baumeister et al., 2001; Peacock and Wong, 1990). Recent work, however, challenges these notions. As reviewed by Luhmann et al. (2020), positive and negative events can have similar beneficial outcomes and qualitatively similar negative events can have different outcomes. Thus, a finer-grained approach to understanding event appraisal is warranted, as it can aid prediction of post-event adjustment.

Addressing this need, Luhmann et al. (2020) developed the Event Characteristics Questionnaire (ECQ) to capture how individuals subjectively experience events. Subscales include perceived challenge (i.e., event-related distress), emotional significance (i.e., strength of elicited

* Corresponding author at: G122 Martha Van Rensselaer Hall, Cornell University, Ithaca, NY 14850, United States of America.
 E-mail address: kar294@cornell.edu (K. Ratner).

affect), impact (i.e., daily disruption), social status change (e.g., changes to reputation), worldview change (i.e., changes to attitudes and beliefs), predictability (i.e., foreseeability), external control (i.e., how much the event was due to others), extraordinariness (i.e., rarity), and valence (i.e., positivity of experience). In their initial studies, lower life satisfaction, lower mood, and higher neuroticism tended to correlate with major events being rated as more challenging, emotionally significant, and impactful; eliciting more changes to one's worldviews and social status; and having a more negative valence. Using the ECQ to predict longitudinal trajectories of well-being post-events, [Luhmann et al. \(2020\)](#) found that the most robust predictors of recovery were valence, extent of change in social status, and impact on daily life. These findings show that event ratings provide meaningful information for understanding concurrent and future well-being.

Given the ECQ's potential to anticipate outcomes associated with major life events, it is important to understand what predicts these event ratings. Initial evidence suggests there is little systematic variation in event appraisals with respect to the Big Five personality traits ([Rakhshani et al., 2021](#)). Thus, developing a wider understanding of dispositional predictors of event appraisal is necessary. Furthermore, exploring appraisals of a campus shutdown could provide useful benchmarks for future work concerning the psychological impact of the pandemic.

2. Depressive symptoms and pandemic response

One individual difference that might impact campus shutdown appraisal is level of depressive symptoms. Often evidencing stability over time ([Musliner et al., 2016](#)), depressive symptoms are continuously distributed throughout the population and resemble, in lower intensity, the features of clinical depression (e.g., [Haslam et al., 2020](#)). Greater depressive symptoms are associated with heightened attention toward negative stimuli ([Koster et al., 2005](#)), more negative thinking about one's past and future ([Dagleish and Werner-Seidler, 2014](#); [Liu et al., 2015](#)), and increased stress reactivity (e.g., [Booij et al., 2018](#); [Morris et al., 2010](#)). Because cognitive features of depression often curtail effective coping and reappraisal (e.g., [Joormann and Gotlib, 2010](#)), depressive symptoms could be associated with appraisals of the shutdown as less positive, more impactful, and more challenging (see also correlates of neuroticism in [Rakhshani et al., 2021](#)). This possibility tracks with evidence that pre-existing mental health conditions contributed to risk for pandemic distress ([Xiong et al., 2020](#)).

Alternatively, depressive symptoms may correspond with milder, or even positive, responses to campus shutdown for two primary reasons. First, while research is still emerging, studies of both adolescent and adult populations suggest that some may have experienced decreases in pre-pandemic internalizing symptoms in the initial days of COVID-19 ([Cost et al., 2021](#); [Penner et al., 2021](#); [Van Winkle et al., 2021](#)). Second, similar to accommodations for workers returning from major depression ([Bastien and Corbière, 2019](#)), some have speculated that features of campus shutdown (e.g., asynchronous instruction, remote meetings, adjusted assignments and grading policies, and relaxed deadlines; see [Flaherty, 2020](#), [Retta, 2020](#)) may have reduced daily pressures on students. Indeed, anecdotal narratives within media (e.g., [Eccles, 2021](#); [Kaufman, 2020](#)) and recent empirical evidence from adolescents ([Silk et al., 2021](#)) suggest that shutdowns sometimes alleviated burdens, particularly those related to works/school achievement and self-presentation, in the early days of the pandemic. Depressive symptoms are characterized by challenges like fatigue and sleep disruption ([American Psychiatric Association, 2013](#)). Thus, remote meetings and asynchronous instruction may have eased pressure associated with having to be in a certain physical location at a set time. Further mitigating strains, depressive symptoms can also include difficulties with focus and feelings of guilt, shame, failure, and inadequacy ([American Psychiatric Association, 2013](#)). Universally relaxed deadlines and more flexible grading policies may have helped individuals who have trouble concentrating—and are prone to feeling like they have failed—not feel

so guilty for accepting accommodation in a time of crisis. Thus, there is reason to suspect that those with greater depressive symptoms pre-pandemic could have experienced campus shutdown as more positive, less challenging, and even less impactful on daily life. Together, the evidence in this section suggests that early depressive symptoms could predict campus shutdown appraisals in both directions.

3. Sense of purpose and pandemic response

Another individual difference that may change appraisals is sense of purpose. Sense of purpose is a stable, overarching direction that organizes daily behaviors around future objectives ([Ryff, 1989](#); [Scheier et al., 2006](#)). Across studies, sense of purpose is a robust correlate of health and psychological well-being, including more adaptive stress responses and affective stability ([Hill et al., 2018](#); [Pfund and Hill, 2018](#)). Purpose may change the way campus shutdown and other events are experienced by reframing the situation—a coping strategy in the TTSC framework ([Lazarus, 1993](#); [Lazarus and Folkman, 1984](#))—and widening one's perspective beyond current circumstances (e.g., [Malin et al., 2019](#); [Yang et al., 2021](#)). In particular, a greater sense of purpose might predict less perceived impact and challenge. In a series of studies ([Burrow et al., 2016](#)), college students with greater purpose rated virtual and real hills around their campus as less steep and requiring less effort to climb. Supporting this view, purpose has been explicitly nominated as a potential source of pandemic resilience ([White, 2020](#)).

By contrast, sense of purpose may also correlate with more negative appraisals of campus shutdown. For example, many academic activities (e.g., lab-based classes, study abroad) taking place in spring 2020 changed drastically or were canceled entirely. The agentic and goal-pursuing attributes of purposeful individuals may make this ubiquitous and uncontrollable obstruction highly distressing. Indeed, goal obstruction is stressful (see, e.g., Control Theory; [Carver and Scheier, 1982](#)) and people who report feeling off-course in life tend to report greater concurrent and future depressive symptoms ([Burrow et al., 2020](#)). Thus, a campus shutdown may have disturbed many goal-directed behaviors, leading purposeful people to be most negatively impacted (see [Hill et al., 2021](#)).

4. The combination of depressive symptoms and sense of purpose on pandemic response

To this point, depressive symptoms and sense of purpose have been discussed as independent individual differences related to event perception. However, both exist concurrently within individuals at varying levels. Testing both the unique and combined prediction of a sense of purpose and depressive symptoms has proven fruitful in studies of cognitive deficits ([Lewis and Hill, 2021](#)), suicidality ([Blažek et al., 2015](#)), and hopelessness ([Marco et al., 2016](#)). Therefore, testing whether pre-shutdown sense of purpose and depressive symptoms interact to predict later event characteristic appraisals could provide greater, and more realistic, insight into the potential role each plays.

5. The present study

This study explored whether depressive symptoms, sense of purpose, and their interaction correspond with concurrent and prospective appraisals of a residential college campus shutdown during the COVID-19 pandemic. As theories of stress appraisal often emphasize the role of negative valence and controllability (e.g., [Baumeister et al., 2001](#); [Lazarus and Folkman, 1984](#); [Peacock and Wong, 1990](#)), the assumed ubiquity of these features in the COVID-19 pandemic provides an interesting context for studying potential variability in appraisals.

6. Method

6.1. Participants and procedure

Participants originated from a pool of 579 students from Cornell University enrolled in a larger, campus-wide study about college adjustment (Ratner, 2020). Returning participants were excluded if they indicated they were not enrolled in school ($n = 32$) or did not correctly answer an attention check at either wave ($n = 167$). Students comprising the final analytic sample ($n = 152$) were in their fourth year ($M_{age} = 20.86$ years [$SD = 0.52$]). The sample was 71.7% female, and was 44.1% White, Non-Hispanic; 32.9% Asian or Pacific Islander; 4.6% Black, Non-Hispanic; 4.6% Hispanic or Latinx; 11.2% multiracial; and 2.0% other/unlisted.

“Time 1” (T1) refers to data collected in fall 2019 (launched September 3rd, 2019) and “Time 2” (T2) to data collected in spring 2020 (launched April 7th, 2020). Each period of data collection lasted ~14 days. In-person classes were suspended on Cornell University’s campus on March 13th, 2020 and virtual instruction began on April 6th, 2020. All data was collected online via Qualtrics. For both observations, participants were compensated with 5.00 USD gift cards and entered into raffles for bonus 25.00 USD gift cards. This study was approved by the Cornell University Institutional Review Board (Protocol Title: The Cornell Experience Study; ID# 1606006394). Although data were existing at the time of the registration, research questions and analytic strategy were preregistered prior to analysis, <https://osf.io/dw6au>. Data, analytic code, and supplements are available at <https://osf.io/n2z3j/>.

6.2. Analytic strategy

All variables were standardized prior to analysis. First, to gain a sense for all unadjusted associations, a correlation matrix was constructed. Next, a series of regressions (comprising T1 purpose, T1 depressive symptoms, and the T1 interaction of these variables) predicted each of the nine ECQ subscales separately. Interactive regressions were evaluated at a Bonferroni-adjusted alpha level corresponding to $p \leq .006$ (0.05/9 models).

6.3. Measures

6.3.1. Depressive symptoms

Depressive symptoms were measured with the 21-item Beck Depression Inventory-II (Beck et al., 1996). Scored from 0 to 3, participants were asked to select the statement that best described how they have been feeling with regard to a certain depressive feature (e.g., sadness) over the last two weeks. A mean score of answered items was used to create a symptom composite, with higher scores indicating greater depressive symptoms. Internal consistency was excellent, $\alpha_{T1,T2} = 0.92, 0.94$.

6.3.2. Sense of purpose

Sense of purpose was measured with the 6-item Life Engagement Test (LET; Scheier et al., 2006). Each item (e.g., “To me, the things I do are all worthwhile”) was rated on a scale ranging from (1) *Strongly Disagree* to (5) *Strongly Agree*. The average of answered items was derived, with higher scores indicating a greater sense of purpose. Internal consistency was strong, $\alpha_{T1,T2} = 0.84, 0.88$.

6.3.3. Responses to COVID-19 campus shutdown

Perceptions of campus shutdown were assessed at T2 by a 36-item version of the Event Characteristics Questionnaire (ECQ; Luhmann et al., 2020). Responses were anchored by instructing participants, “The event we would like you to think about when answering these questions is Cornell’s March 2020 decision to ask students to leave campus and move to virtual instruction for the remainder of the spring semester.” Each item was rated on a scale from (1) *Not at all Correct* to (5)

Completely Correct, and the average of answered items from each subscale was derived. The nine ECQ subscales were *challenge* (4 items, $\alpha = 0.89$), *emotional significance* (4 items, $\alpha = 0.84$), *external control* (4 items, $\alpha = 0.92$), *extraordinariness* (2 items, $r([149]) = 0.40, p < .001^1$), *impact* (4 items, $\alpha = 0.86$), *predictability* (4 items, $\alpha = 0.81$), *social status change* (4 items, $\alpha = 0.92$), *valence* (with higher scores indicating greater positivity; 6 items, $\alpha = 0.81$), and *change in worldview* (4 items, $\alpha = 0.89$).

7. Results

Table 1 presents descriptive statistics and standardized correlations. In general, depressive symptoms and sense of purpose remained relatively stable from T1 to T2, and their cross-sectional correlations with one another were of similar magnitude. Many prospective and concurrent associations between depressive symptoms, purpose, and event characteristics failed to reach significance. However, those with greater depressive symptoms at both T1 and T2 were more likely to report that the shutdown was attributable to others ($r_{T1} = 0.23, p < .001$; $r_{T2} = 0.19, p < .001$) and their social standing changed as a result ($r_{T1} = 0.18, p < .05$; $r_{T2} = 0.35, p < .001$). In contrast, there were negative prospective ($r = -0.18, p < .05$) and cross-sectional ($r = -0.25, p < .001$) associations between sense of purpose and social status change, suggesting greater purpose corresponded with fewer perceived changes to social standing as a result of shutdown.

Regressions examining the unique effects of, and interaction between, depressive symptoms and purpose in their prediction of event characteristics are in Table 2. At our adjusted threshold ($p = .006$), we found a positive main effect for depressive symptoms on external control: beyond the effect of purpose, people who reported more depressive symptoms at the beginning of the academic year tended to feel that the later campus shutdown was due to others ($\beta = 0.38[0.12], p = .002$). We also found a positive main effect for purpose on change in worldviews ($\beta = 0.29[0.10], p = .006$). Those scoring highest on sense of purpose in fall tended to report more change in worldviews following mid-spring’s shutdown. We failed to find evidence for any interaction between depressive symptoms and sense of purpose in predicting ECQ outcomes.

7.1. Additional analyses

In the course of peer review, we conducted a series of unregistered tests examining the prediction of ECQ subscales when T2 purpose and T2 depressive symptoms were added as controls to the prospective models. The full results of these analyses are available on our OSF repository (see ST1 “Regressions Controlling for T2 Depressive Symptoms and Purpose”). Consistent with their conceptualizations as individual differences, both sense of purpose and depressive symptoms exhibited high rank-order stability (Table 1). As such, few predictors in these models failed to uniquely relate to ECQ outcomes when T1 and T2 were entered simultaneously. The one exception was the tendency for concurrent depressive symptoms to positively predict perceived changes to social status due to shutdown ($p = .002$).

8. Discussion

The COVID-19 pandemic is among the most widespread and destabilizing events in recent history. This study of college students explored how depressive symptoms and sense of purpose were related to

¹ Luhmann et al. (2020) created a 4-item measure of extraordinariness. Post-registration, we decided to drop the first and last items because there was limited variability among responses. The two items used for extraordinariness were “Most people like me experience this event sometime in their lives” and “It is uncommon for people like me to experience such an event in their lives.” More details in “S1 Protocol Deviations” in the Supplemental Materials folder of the project repository.

Table 1
Means, standard deviations, and correlations with 95% confidence intervals.

Variable	<i>M</i> (<i>SD</i>)	<i>Min.</i> <i>Max.</i>	1	2	3	4	5	6	7	8	9	10	11	12
1. Purpose T1	4.15 (0.73)	1.17 5.00												
2. Purpose T2	4.02 (0.84)	1.33 5.00	0.73**											
			[0.64, 0.79]											
3. Depression T1	0.38 (0.40)	0.00 2.24	-0.63**	-0.46**										
			[-0.71, -0.52]	[-0.58, -0.32]										
4. Depression T2	0.43 (0.45)	0.00 2.67	-0.46**	-0.57**	0.61**									
			[-0.57, -0.32]	[-0.67, -0.45]	[0.49, 0.70]									
5. Challenge	3.75 (1.07)	1.00 5.00	0.07	0.05	0.05	0.07								
			[-0.09, 0.23]	[-0.11, 0.21]	[-0.11, 0.21]	[-0.09, 0.22]								
6. Emotional Significance	3.97 (1.00)	1.00 5.00	0.08	0.05	0.01	0.07	0.75**							
			[-0.08, 0.23]	[-0.11, 0.21]	[-0.15, 0.17]	[-0.09, 0.23]	[0.67, 0.81]							
7. External Control	2.96 (1.25)	1.00 5.00	-0.02	-0.09	0.23**	0.19*	0.09	0.09						
			[-0.18, 0.14]	[-0.25, 0.07]	[0.07, 0.37]	[0.03, 0.34]	[-0.08, 0.24]	[-0.07, 0.24]						
8. Extraordinariness	3.61 (1.13)	1.00 5.00	-0.02	-0.04	0.11	0.11	0.13	0.12	0.30**					
			[-0.18, 0.14]	[-0.19, 0.12]	[-0.05, 0.26]	[-0.05, 0.27]	[-0.03, 0.28]	[-0.04, 0.27]	[0.15, 0.44]					
9. Impact	4.36 (0.78)	1.50 5.00	0.08	0.08	0.02	0.15	0.48**	0.62**	0.05	0.08				
			[-0.08, 0.24]	[-0.08, 0.24]	[-0.14, 0.18]	[-0.01, 0.30]	[0.34, 0.59]	[0.51, 0.71]	[-0.11, 0.21]	[-0.08, 0.24]				
10. Predictability	2.09 (0.90)	1.00 4.25	0.05	-0.03	-0.04	-0.08	-0.38**	-0.33**	-0.06	-0.19*	-0.33**			
			[-0.11, 0.20]	[-0.19, 0.13]	[-0.19, 0.12]	[-0.23, 0.08]	[-0.51, -0.24]	[-0.46, -0.18]	[-0.22, 0.10]	[-0.34, -0.03]	[-0.46, -0.18]			
11. Social Status Change	1.80 (0.96)	1.00 5.00	-0.18*	-0.25**	0.18*	0.35**	0.14	0.28**	0.01	-0.01	0.29**	-0.20*		
			[-0.33, -0.02]	[-0.39, -0.09]	[0.02, 0.33]	[0.20, 0.48]	[-0.02, 0.29]	[0.12, 0.42]	[-0.15, 0.16]	[-0.17, 0.15]	[0.14, 0.43]	[-0.35, -0.04]		
12. Valence	1.94 (0.73)	1.00 4.17	0.04	0.12	-0.07	-0.16	-0.42**	-0.53**	-0.07	-0.16*	-0.42**	0.33**	-0.30**	
			[-0.12, 0.20]	[-0.04, 0.27]	[-0.23, 0.09]	[-0.31, 0.00]	[-0.54, -0.28]	[-0.63, -0.40]	[-0.22, 0.09]	[-0.31, -0.00]	[-0.55, -0.28]	[0.19, 0.47]	[-0.43, -0.14]	
13. Change in Worldview	3.68 (0.99)	1.00 5.00	0.15	0.09	0.04	0.09	0.19*	0.31**	0.01	-0.10	0.26**	-0.06	0.07	-0.13
			[-0.01, 0.30]	[-0.07, 0.24]	[-0.12, 0.20]	[-0.07, 0.25]	[0.04, 0.34]	[0.16, 0.45]	[-0.15, 0.17]	[-0.26, 0.06]	[0.10, 0.40]	[-0.22, 0.10]	[-0.09, 0.23]	[-0.29, 0.03]

Note. *M* = Mean, *SD* = standard deviation, T1 = Time 1, T2 = Time 2. * $p < .05$, ** $p < .01$.

Table 2

Prospectively predicting time 2 perceived event characteristics from time 1 depressive symptoms and sense of purpose.

	Challenge β (S.E.) 99% CI	ES β (S.E.) 99% CI	EC β (S.E.) 99% CI	EXO β (S.E.) 99% CI	Impact β (S.E.) 99% CI	Predict. β (S.E.) 99% CI	SSC β (S.E.) 99% CI	Valence β (S.E.) 99% CI	CWV β (S.E.) 99% CI
Dep T1	0.210 (0.12) [-0.11, 0.53]	0.176 (0.12) [-0.14, 0.50]	0.376 (0.12) [0.06, 0.69]	0.310 (0.12) [-0.01, 0.63]	0.130 (0.12) [-0.19, 0.45]	-0.084 (0.12) [-0.41, 0.24]	0.230 (0.12) [-0.08, 0.54]	-0.079 (0.12) [-0.40, 0.25]	0.244 (0.12) [-0.07, 0.56]
<i>p</i>	0.090	0.154	0.002	0.012	0.294	0.499	0.058	0.526	0.046
PIL T1	0.147 (0.11) [-0.13, 0.42]	0.113 (0.11) [-0.16, 0.39]	0.196 (0.10) [-0.07, 0.47]	0.034 (0.10) [-0.24, 0.31]	0.155 (0.11) [-0.12, 0.43]	0.059 (0.11) [-0.22, 0.34]	-0.150 (0.10) [-0.42, 0.12]	-0.002 (0.11) [-0.28, 0.28]	0.291 (0.10) [0.02, 0.56]
<i>p</i>	0.167	0.288	0.059	0.742	0.145	0.578	0.149	0.982	0.006
DepXPIL T1	0.069 (0.08) [-0.13, 0.27]	0.096 (0.08) [-0.10, 0.29]	0.027 (0.07) [-0.17, 0.22]	0.177 (0.07) [-0.02, 0.37]	0.009 (0.08) [-0.19, 0.21]	-0.084 (0.08) [-0.28, 0.11]	0.142 (0.07) [-0.05, 0.33]	-0.006 (0.08) [-0.20, 0.19]	0.018 (0.07) [-0.18, 0.21]
<i>p</i>	0.362	0.202	0.717	0.018	0.905	0.272	0.056	0.942	0.811
<i>R</i> ²	0.024	0.022	0.077	0.052	0.016	0.010	0.064	0.005	0.055

Notes: T1 = Time 1, Dep = Depressive symptoms, PIL = Sense of purpose, DepXPIL = Interaction between depressive symptoms and sense of purpose, ES = Emotional significance, EC = External control, EXO = Extraordinariness, Predict. = Predictability, SSC = Social Status Change, CWV = Change in worldview. Lag T1 to T2 is ~7 months. Bold is significant at adjusted alpha-level (0.05/9 = 0.006).

appraisals of a major pandemic event, college campus shutdown. By testing both prospective and cross-sectional relations, this study increases understanding of how depressive symptoms and sense of purpose figure into event appraisals and grants insight into processes that occurred during the early days of U.S. pandemic response. In general, our descriptive statistics suggest that the shutdown was appraised as rather challenging, emotionally significant, impactful on daily life, unpredictable, negative, and minimally disruptive to this sample's social status. These findings document the unsettling nature of campus shutdown, and align with what one might expect when graduating students are asked to leave abruptly.

Those with greater depressive symptoms tended to feel that their social standing suffered more because of the campus shutdown, and those with a greater sense of purpose tended to perceive fewer changes in this regard. These findings align with existing evidence that depressive symptoms forecast greater reactivity (e.g., Morris et al., 2010), whereas sense of purpose tends to signal greater stability (e.g., Hill et al., 2018), in the face of stress. Furthermore, pre-shutdown depressive symptoms positively predicted feeling like the shutdown was out of personal control, pre-shutdown sense of purpose positively predicted greater changes to worldview due to the event, and we failed to find evidence that purpose and depressive symptoms interacted to predict downstream appraisals. The prospective main effect for depression tracks with classic theories of depressive etiology like learned helplessness (Seligman, 1972) and hopelessness (e.g., Liu et al., 2015). Both theories position those with depression as feeling powerless, unable to change aspects of their suboptimal situation or the future thereof. A question for longitudinal follow-up is whether feeling like the situation was due to the actions of others complicated adjustment for those with greater depressive symptoms.

The findings regarding purpose predicting greater changes in worldview following the shutdown are less straightforward, especially since the direction of change was not captured. On one hand, purpose is related to finding new goals to pursue (Wrosch et al., 2003). Purposeful people reporting more changes in worldview following the campus shutdown may support this notion. On the other hand, Luhmann et al. (2020) found that more changes in worldview corresponded with lower mood and life satisfaction. As such, a positive correlation could signal that purposeful individuals were most jarred by the shutdown (see Hill et al., 2021). This could be due to the distressing nature of goal obstruction (Carver and Scheier, 1982), leading the most goal-driven students to re-evaluate basic orientations toward academics. Depending on the well-being trajectories of the most purposeful, longitudinal research could lend credence to the latter explanation and motivate investigation into when a sense of purpose is beneficial. This study provides the basis for examining such future processes (i.e., purpose predicts event perception which, in turn, predicts adjustment).

It is noteworthy that we evidenced mostly null effects across

registered models. Although we must be conservative in the interpretation of null effects, our inability to locate a consistent pattern raises several possibilities, including whether some events overwhelm individual differences (e.g., Cooper and Withey, 2009) and if students have been more resilient than they have been given credit. When concurrent depressive symptoms and purpose were added to the prospective models, nearly all predictors failed to relate to event appraisals. Paired with the high test-retest coefficients of depressive symptoms and purpose we observed, this suggests some level of serial dependence. In other words, these results speak to the short-term (~7 month) stability of these individual differences. However, what is extraordinary here—and what significantly contributes to the literature—is the life-altering context in which this stability has now been documented.

8.1. Limitations and future directions

While the longitudinal design is a strength, several limitations should be noted. First, a number of our null results could be due to our “both ways” theorizing being correct, but the dataset is limited in the range of moderators that could adjudicate between pathways. For example, understanding the content of one's purpose could be relevant for the associations studied here: a student with a family-oriented purpose and a student with an occupation-oriented purpose might perceive campus shutdown very differently. Second, maybe participants were surveyed too late or too early following shutdown for effects to be detected. Given that uncertainty and situational clarity are critical in the evaluation of stressors (Greco and Roger, 2003; Lazarus and Folkman, 1984), results may have been different depending on whether students were surveyed immediately after the closure announcement or later in the summer when the gravity of the situation had been established. Third, both with respect to students' year in school and the highly competitive institution they attended, the effects reported here may not generalize to other students at this university or to students who experienced a shutdown at a different university. Finally, the pandemic and associated shutdowns are remarkable events. Our results cannot directly speak to what sense of purpose or depressive symptoms predict in other disruptive circumstances. Still, these findings contribute to the broader empirical snapshot of students' lives during the pandemic. This may provide helpful information for universities as they face upcoming academic years with largely on-campus instruction and new features of the COVID-19 landscape. As research and knowledge on the pandemic accumulates, studies such as this will be valuable for understanding and eventually predicting the most vulnerable and protected during catastrophe.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.paid.2021.111475>.

References

- Correal, A. (2020). *College in the Coronavirus era: Wistful goodbyes and a sense of loss*. The New York Times.
- Czeisler, M. E., Lane, R. I., Petrosky, E., Wiley, J. F., Christensen, A., Njai, R., Rajaratnam, S. M. W., ... (2020). Mental health, substance use, and suicidal ideation during the COVID-19 pandemic—United States, June 24–30, 2020. *MMWR. Morbidity and Mortality Weekly Report*, 69(32), 1049–1057. <https://doi.org/10.15585/mmwr.mm6932a1>
- Morris, M. C., Ciesla, J. A., & Garber, J. (2010). A prospective study of stress autonomy versus stress sensitization in adolescents at varied risk for depression. *Journal of Abnormal Psychology*, 119(2), 341–354. <https://doi.org/10.1037/a0019036>
- Hill, P. L., Sin, N. L., Turiano, N. A., Burrow, A. L., & Almeida, D. M. (2018). Sense of purpose moderates the associations between daily stressors and daily well-being. *Annals of Behavioral Medicine*, 52(8), 724–729. <https://doi.org/10.1093/abm/kax039>
- Hill, P. L., Klaiher, P., Burrow, A. L., DeLongis, A., & Sin, N. L. (2021). Purposefulness and daily life in a pandemic: Predicting daily affect and physical symptoms during the first weeks of the COVID-19 response. *Psychology & Health*. <https://doi.org/10.1080/08870446.2021.1914838>. Advance online publication.
- Luhmann, M., Orth, U., Specht, J., Kandler, C., & Lucas, R. E. (2014). Studying changes in life circumstances and personality: It's about time. *European Journal of Personality*, 28(3), 256–266. <https://doi.org/10.1002/per.1951>
- Luhmann, M., Fassbender, I., Alcock, M., & Hähner, P. (2020). A dimensional taxonomy of perceived characteristics of major life events. *Journal of Personality and Social Psychology*. <https://doi.org/10.1037/pspp0000291>. Advance online publication.
- Dohrenwend, B. P. (2000). The role of adversity and stress in psychopathology: Some evidence and its implications for theory and research. *Journal of Health and Social Behavior*, 41(1), 1–19.
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer.
- Baumeister, R. F., Bratslavsky, E., Finkenauer, C., & Vohs, K. D. (2001). Bad is stronger than good. *Review of General Psychology*, 5(4), 323–370. <https://doi.org/10.1037/1089-2680.5.4.323>
- Peacock, E. J., & Wong, P. T. (1990). The stress appraisal measure (SAM): A multidimensional approach to cognitive appraisal. *Stress Medicine*, 6(3), 227–236. <https://doi.org/10.1002/smi.2460060308>
- Rakhshani, A., Lucas, R. E., Donnellan, B., Fassbender, I., & Luhmann, M. (2021). Personality and perceptions of major life events. *European Journal of Personality*, 35(5). <https://doi.org/10.1177/08902070211045825>
- Musliner, K. L., Munk-Olsen, T., Eaton, W. W., & Zandi, P. P. (2016). Heterogeneity in long-term trajectories of depressive symptoms: Patterns, predictors and outcomes. *Journal of Affective Disorders*, 192, 199–211. <https://doi.org/10.1016/j.jad.2015.12.030>
- Haslam, N., McGrath, M. J., Viechtbauer, W., & Kuppens, P. (2020). Dimensions over categories: A meta-analysis of taxometric research. *Psychological Medicine*, 50(9), 1418–1432. <https://doi.org/10.1017/S003329172000183X>
- Koster, E. H. W., Raedt, R. D., Goeleven, E., Franck, E., & Crombez, G. (2005). Mood-congruent attentional bias in dysphoria: Maintained attention to and impaired disengagement from negative information. *Emotion*, 5(4), 446–455. <https://doi.org/10.1037/1528-3542.5.4.446>
- Dalgleish, T., & Werner-Seidler, A. (2014). Disruptions in autobiographical memory processing in depression and the emergence of memory therapeutics. *Trends in Cognitive Sciences*, 18(11), 596–604. <https://doi.org/10.1016/j.tics.2014.06.010>
- Liu, R. T., Kleiman, E. M., Nestor, B. A., & Cheek, S. M. (2015). The hopelessness theory of depression: A quarter century in review. *Clinical Psychology: Science and Practice*, 22(4), 345–365. <https://doi.org/10.1111/cpsp.12125>
- Booij, S. H., Snippe, E., Jeronimus, B. F., Wichers, M., & Wigman, J. T. W. (2018). Affective reactivity to daily life stress: Relationship to positive psychotic and depressive symptoms in a general population sample. *Journal of Affective Disorders*, 225, 474–481. <https://doi.org/10.1016/j.jad.2017.08.051>
- Jormann, J., & Gotlib, I. H. (2010). Emotion regulation in depression: Relation to cognitive inhibition. *Cognition & Emotion*, 24(2), 281–298. <https://doi.org/10.1080/02699930903407948>
- Xiong, J., Lipsitz, O., Nasri, F., Lui, L. M. W., Gill, H., Phan, L., Chen-Li, D., Iacobucci, M., Ho, R., Majeed, A., & McIntyre, R. S. (2020). Impact of COVID-19 pandemic on mental health in the general population: A systematic review. *Journal of Affective Disorders*, 277, 55–64. <https://doi.org/10.1016/j.jad.2020.08.001>
- Cost, K. T., Crosbie, J., Anagnostou, E., Birken, C. S., Charach, A., Monga, S., & Korczak, D. J. (2021). Mostly worse, occasionally better: Impact of COVID-19 pandemic on the mental health of Canadian children and adolescents. Advance online publication *European Child & Adolescent Psychiatry*. <https://doi.org/10.1007/s00787-021-01744-3>
- Penner, F., Ortiz, J. H., & Sharp, C. (2021). Change in youth mental health during the COVID-19 pandemic in a majority Hispanic/Latinx US sample. *Journal of the American Academy of Child & Adolescent Psychiatry*, 60(4), 513–523. <https://doi.org/10.1016/j.jaac.2020.12.027>
- Van Winkle, Z., Ferragina, E., & Recchi, E. (2021). The unexpected decline in feelings of depression among adults ages 50 and older in 11 European countries amid the COVID-19 pandemic. *Socius*, 7. <https://doi.org/10.1177/23780231211032741>, 23780231211032740.
- Bastien, M.-F., & Corbière, M. (2019). Return-to-work following depression: What work accommodations do employers and human resources directors put in place? *Journal of Occupational Rehabilitation*, 29(2), 423–432. <https://doi.org/10.1007/s10926-018-9801-y>
- Flaherty, C. (2020). Grading for a pandemic. Inside Higher Ed. April 23 <https://www.insidehighered.com/news/2020/04/23/how-lenient-or-not-should-professors-be-students-right-now>.
- Retta, M. (2020). How colleges are grading students during coronavirus. NPR. April 10 <https://www.npr.org/2020/04/10/830622398/how-colleges-are-grading-students-during-coronavirus>.
- Eccles, L. (2021). Returning to reality: The taboo of admitting that you love lockdown. The Times. April 11 <https://www.thetimes.co.uk/article/returning-to-reality-the-taboo-of-admitting-that-you-love-lockdown-n9vbp59qt>.
- Kaufman, J. (2020). Loving the lockdown. The New York Times. May 29 <https://www.nytimes.com/2020/05/29/realestate/coronavirus-lockdown-coping.html>.
- Silk, J. S., Scott, L. N., Hutchinson, E. A., Lu, C., Sequeira, S. L., McKone, K. M. P., Ladouceur, C. D., ... (2021). Storm clouds and silver linings: Day-to-day life in COVID-19 lockdown and emotional health in adolescent girls. *Journal of Pediatric Psychology*, jsab107. <https://doi.org/10.1093/jpepsy/jsab107>
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). <https://doi.org/10.1176/appi.books.9780890425596>
- Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology*, 57(6), 1069–1081. <https://doi.org/10.1037/0022-3514.57.6.1069>
- Scheier, M. F., Wrosch, C., Baum, A., Cohen, S., Martire, L. M., Matthews, K. A., Schulz, R., & Zdzienicka, B. (2006). The life engagement test: Assessing purpose in life. *Journal of Behavioral Medicine*, 29(3), 291–298. <https://doi.org/10.1007/s10865-005-9044-1>
- Pfund, G. N., & Hill, P. L. (2018). The multifaceted benefits of purpose in life. *The International Forum for Logotherapy*, 41, 27–37.
- Lazarus, R. S. (1993). Coping theory and research: Past, present, and future. *Psychosomatic Medicine*, 55(3), 234–247. <https://doi.org/10.1097/00006842-199305000-00002>
- Malin, H., Morton, E., Nadal, A., & Smith, K. A. (2019). Purpose and coping with adversity: A repeated measures, mixed-methods study with young adolescents. *Journal of Adolescence*. <https://doi.org/10.1016/j.adolescence.2019.07.015>. Advance online publication.
- Yang, Z., Ji, L.-J., Yang, Y., Wang, Y., Zhu, L., & Cai, H. (2021). Meaning making helps cope with COVID-19: A longitudinal study. *Personality and Individual Differences*, 174, Article 110670. <https://doi.org/10.1177/01461672110670>
- Burrow, A. L., Hill, P. L., & Sumner, R. (2016). Leveling mountains: Purpose attenuates links between perceptions of effort and steepness. *Personality and Social Psychology Bulletin*, 42(1), 94–103. <https://doi.org/10.1177/0146167215615404>
- White, A. E. (2020). Purpose as a powerful resource in the time of COVID-19. *Journal of Humanistic Psychology*, 60(5), 682–689. <https://doi.org/10.1177/0022167820940464>
- Carver, C. S., & Scheier, M. F. (1982). Control theory: A useful conceptual framework for personality-social, clinical, and health psychology. *Psychological Bulletin*, 92(1), 111–135. <https://doi.org/10.1037/0033-2909.92.1.111>
- Burrow, A. L., Hill, P. L., Ratner, K., & Fuller-Rowell, T. E. (2020). Derailment: Conceptualization, measurement, and adjustment correlates of perceived change in self and direction. *Journal of Personality and Social Psychology*, 118(3), 584–601. <https://doi.org/10.1037/pspp0000209>
- Lewis, N. A., & Hill, P. L. (2021). Sense of purpose promotes resilience to cognitive deficits attributable to depressive symptoms. *Frontiers in Psychology*, 12, 2517. <https://doi.org/10.3389/fpsyg.2021.698109>
- Błażek, M., Kaźmierczak, M., & Besta, T. (2015). Sense of purpose in life and escape from self as the predictors of quality of life in clinical samples. *Journal of Religion and Health*, 54(2), 517–523. <https://doi.org/10.1007/s10943-014-9833-3>
- Marco, J. H., Pérez, S., & García-Alandete, J. (2016). Meaning in life buffers the association between risk factors for suicide and hopelessness in participants with mental disorders. *Journal of Clinical Psychology*, 72(7), 689–700. <https://doi.org/10.1002/jclp.22285>
- Beck, A. T., Steer, R. A., & Brown, G. (1996). *Manual for the Beck Depression Inventory-II*. Psychological Corporation.
- Seligman, M. E. (1972). Learned helplessness. *Annual Review of Medicine*, 23, 407–412. <https://doi.org/10.1146/annurev.me.23.020172.002203>
- Wrosch, C., Scheier, M. F., Miller, G. E., Schulz, R., & Carver, C. S. (2003). Adaptive self-regulation of unattainable goals: Goal disengagement, goal reengagement, and subjective well-being. *Personality & Social Psychology Bulletin*, 29(12), 1494–1508. <https://doi.org/10.1177/0146167203256921>
- Cooper, W. H., & Withey, M. J. (2009). The strong situation hypothesis. *Personality and Social Psychology Review*, 13(1), 62–72. <https://doi.org/10.1177/1088868308329378>
- Greco, V., & Roger, D. (2003). Uncertainty, stress, and health. *Personality and Individual Differences*, 34(6), 1057–1068. [https://doi.org/10.1016/S0191-8869\(02\)00091-0](https://doi.org/10.1016/S0191-8869(02)00091-0)
- Ratner, K. (2020). Derailment and depression across college: Trajectories of perceived identity change, adjustment, and moderators of their association (Publication No. 28025614) [Doctoral dissertation, Cornell University]. ProQuest Dissertations & Theses Global.