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

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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...
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 ECQs 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 (Dalgleish and Werner-Seidl, 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 Corbiere, 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 work/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 toward 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, 1999; 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 (Blazek 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#: 1606060394). 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 ≤ 0.006 (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, α_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, α_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, α = 0.89), emotional significance (4 items, α = 0.84), external control (4 items, α = 0.92), extraordinariness (2 items, r[149] = 0.40, p < .001), impact (4 items, α = 0.86), predictability (4 items, α = 0.81), social status change (4 items, α = 0.92), valence (with higher scores indicating greater positivity; 6 items, α = 0.81), and change in worldview (4 items, α = 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_T1 = -0.18, p < .05) and cross-sectional (r = -0.25, p < .001) associations between sense of purpose and social status change, suggesting greater purpose correspondence 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 (b = 0.38[0.12], p < .002). We also found a positive main effect for purpose on change in worldviews (b = 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...
| Variable       | M (SD)       | Min. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|----------------|--------------|------|---|---|---|---|---|---|---|---|---|----|----|----|
| 1. Purpose T1 | 4.15 (0.73)  | 1.17 | 5.00 | 0.73** | 0.64, 0.79 | | | | | | | | | |
| 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 | | | | | | | |
| 6. Emotional Significance | 3.97 (1.00) | 1.00 | 5.00 | 0.08 | 0.05 | 0.01 | 0.07 | 0.75** | | | | | | |
| 7. External Control | 2.96 (1.25) | 1.00 | 5.00 | -0.02 | -0.09 | 0.23** | 0.19* | 0.09 | 0.09 | | | | | |
| 8. Extraordinariness | 3.61 (1.13) | 1.00 | 5.00 | -0.02 | -0.04 | 0.11 | 0.11 | 0.13 | 0.12 | 0.30** | | | | |
| 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 | | | |
| 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** | | |
| 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* | |
| 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** |
| 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 |

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 | ES (S.E.) | EC (S.E.) | EXO (S.E.) | Impact (S.E.) | Predict. (S.E.) | SSC (S.E.) | Valence (S.E.) |
|----------------|-----------|-----------|-----------|------------|---------------|----------------|------------|---------------|
| Dep T1         | 0.210 (0.12) | 0.176 (0.12) | 0.376 (0.12) | 0.310 (0.12) | 0.130 (0.12) | -0.084 (0.12) | 0.230 (0.12) | -0.079 (0.12) | 0.244 (0.12) |
| PIL T1         | 0.147 (0.11) | 0.113 (0.11) | 0.166 (0.10) | 0.034 (0.10) | 0.155 (0.11) | 0.059 (0.11) | -0.150 (0.10) | -0.002 (0.11) | 0.291 (0.10) |
| p              | 0.167      | 0.288      | 0.059      | 0.742      | 0.145         | 0.578         | 0.149      | 0.982         | 0.006         |
| DepXPIL T1     | 0.069 (0.08) | 0.096 (0.08) | 0.027 (0.07) | 0.177 (0.07) | 0.099 (0.08) | -0.084 (0.08) | 0.142 (0.07) | -0.006 (0.08) | 0.018 (0.07) |
| p              | 0.362      | 0.262      | 0.717      | 0.018      | 0.905         | 0.272         | 0.056      | 0.942         | 0.011         |
| R²             | 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 = Extradiaries, 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 worldview following the 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.

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.
