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The Protective Role of Perceived Control on Associations Between Job Loss, Financial Difficulties, and Substance Use Among Young Adults Early in the COVID-19 Pandemic

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Abstract
Adverse life events that threaten normative transitions are associated with increased alcohol and cannabis use among young adults. However, few studies have tested the extent to which specific negative events impact substance use behaviors nor identified relevant risk or protective factors (e.g., perceived control). During the COVID-19 pandemic, young adults experienced economic adversities (i.e., job loss and financial strain) at disproportionally high rates. This provided a unique opportunity to test associations between job loss/financial difficulties and substance use outcomes and whether perceived control in work and finance domains moderated these associations. Young adults completed self-report surveys at two time points−prior to the COVID-19 pandemic (January 2020) and in the acute phase of the pandemic (April/May 2020). Participants ($N = 519$; $M_{age} = 25.4$ years; 62.8% female) were recruited in and around Seattle, WA, as part of an ongoing longitudinal cohort study. Pandemic-related job loss (18.9%) and financial difficulty (49.7%) were relatively common in this sample. Job loss was associated with increased number of drinks on the heaviest past-month drinking occasion (from January 2020 to April/May 2020). Financial difficulty was associated with increased drinking frequency and number of drinks on the heaviest drinking occasion. The effect of job loss and financial difficulty on alcohol and cannabis use was generally moderated by participants' perceived control of these domains. For those with low perceived control, job loss/financial difficulty was associated with *increased* alcohol/cannabis use, but for those high in perceived control, job loss/financial difficulty was associated with *decreased* alcohol use frequency. Findings give advance understanding of how economic adversities relate to young adults' alcohol and cannabis use. Notably, perceived control over these domains may be modifiable through prevention efforts aiming to foster self-efficacy among young people and policy to provide available agency to those in need.

Keywords Alcohol · Drinking · Cannabis · Marijuana · Self-efficacy

Young adulthood (i.e., ages 18–30) is a developmental period marked by normative transitions into adult roles in numerous life domains, including building the foundation for one's career and establishing financial independence (Osgood et al., 2005; Settersten, 2007; Shanahan et al., 2005). These transitions may be associated with increased stress and internal pressures to reach key developmental milestones (Mahmoud et al., 2012; Newman & Newman, 2008). When young adults are faced with threats to these transitions and milestones, some may manage these challenges and stressors in unhealthy ways, such as increased substance use, due to lack of effective coping strategies (Lane et al., 2017; Mahmoud et al., 2012). As such, there is a need to identify risk and protective factors that explain associations between stressful adverse events that threaten young adults' normative transitions and substance use behaviors (i.e., alcohol and cannabis use).

Developmental-contextual models (Schulenberg et al., 2002, 2005) posit that increased periods of instability and stress occurring simultaneously across multiple domains can be overwhelming for young adults (Patrick et al., 2020), and overloading one's coping capacity can lead to increased substance use as a maladaptive attempt to cope with the increased stress (Kuntsche et al., 2005; Patrick et al., 2018). In line with this notion, self-medication theories hold that adverse emotions and psychological distress can motivate substance use as a form of negative reinforcement (Khantzian, 1997). Taking these theoretical perspectives into account, several studies

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show that life stressors associated with normative transitions—particularly those viewed as negative or adverse–can lead to increased substance use for young adults (Cadigan et al., 2021; Graupensperger, Cadigan, et al. 2021b). However, the extent to which specific negative life events impact substance use behaviors remains understudied, and it is not clear why such events may lead to increased substance use for some, but not all young adults.

Adverse Economic Impacts During the COVID-19 Pandemic

During young adulthood, many young adults are working towards establishing their careers and achieving financial independence. The COVID-19 pandemic has been a challenging time for young adults, in part due to pandemic-related economic stressors (Graupensperger et al., 2022; Graupensperger, Cadigan, et al. 2021a; Hawes et al., 2021; Shanahan et al., 2020). Loss of employment and other financial struggles have disproportionately affected young adults. Notably, unemployment spiked more dramatically for young adults relative to other age groups, rising from 8.0% in February 2020 to 25.3% in May 2020 (Kochnar, 2020). The PEW Research Center also showed that young adults, compared to other age groups, reported the highest prevalence of COVID-19-related financial strain, job loss, pay-cuts, and forced unpaid leave (Menasce Horowitz et al., 2021). Although these dismal trends are concerning for young adults, the high prevalence of job loss and financial strain during this time presents a unique opportunity to further expand our understanding of how, and for whom, adverse economic impacts are associated with increased substance use.

Although the full scope of how COVID-19 has (and will) impact the economy is yet to be seen, we turn to literature from the Great Recession of 2008 as an indicator of how financial shock in terms of job loss and financial distress may relate to substance use (Swift et al., 2020). Among all adults, estimates generally showed increased alcohol and cannabis use during the Great Recession (Carliner et al., 2017; Frone, 2016), but the effects were somewhat mixed when focused only on young adults. For example, Compton and colleagues (2014) found that unemployment (during the Great Recession) was associated with higher rates of alcohol and other drug use among all subgroups *except* for young adults aged 18–25, where there was no significant effect, on average. Another study similarly found that associations between severe economic losses and alcohol use indices were strong among most adult age groups, but relatively less so among young adults (Mulia et al., 2014). Notably though, the Great Recession had a more salient financial impact on older adults than younger adults (e.g., retirement plans; Helppie-Mcfall & Mcardle, 2011). The COVID-19 pandemic has been different in many ways; alongside job and financial impacts, there was limited access to traditional forms of social support given lockdown restrictions. Thus, identifying risk and resilience factors in the face of economic strain during a time with restricted coping resources will aid prevention efforts for future cohorts experiencing similar concerns.

Perceived Control as a Protective Factor. Identifying moderators of the association between economic adversities and substance use behaviors is important for understanding risk and protective factors (i.e., for *whom* do these events elicit increased substance use?). One potentially relevant factor is perceived control, which is a key component of self-efficacy and a prominent feature of social cognitive theory (Bandura, 2001). Indeed, social cognitive theory posits that beliefs about personal agency—one's perceived capacity for action encompassing direct control and having an influence over outcomes—function as an important set of proximal determinants of human motivation, affect, and action (Bandura, 1989). Put into the context of the COVID-19 pandemic, perceived control may influence young adults' preparedness for periods of instability caused by adverse economic impacts as well as their ability to cope with the increased stress in adaptive ways. In partial support of this contention, greater self-efficacy was positively associated with taking precautionary measures to reduce financial distress (e.g., putting aside emergency funds) as well as financial resilience after an unexpected job loss, even when controlling for other important factors, including education and net worth (Kuhnen & Melzer, 2018). Self-efficacy was also associated with greater use of adaptive problem-focused coping strategies and lower use of maladaptive emotion-focused strategies (e.g., avoidance and self-blame) in response to work-related stressors (Terry et al., 1995). While young adults with perceived control may be less prepared for and/or equipped to handle adverse economic impacts, those who believe they are in control of their own fate may *reduce* their substance use and focus on taking steps necessary to find employment or overcome financial struggles. Testing this premise—that perceived control may play a protective role as it pertains to substance use when young adults face economic adversities—will help elucidate risk factors and inform prevention strategies.

Current Study

The current study examined associations between young adults' job loss and financial difficulties during the initial phase of the COVID-19 pandemic and changes in alcohol and cannabis use, relative to pre-pandemic (assessed in January 2020). Moreover, we tested whether perceived

control towards one's work situation and financial situation moderated associations between job loss/financial difficulty and substance use behaviors. We tested two primary hypotheses: (1) Those experiencing job loss and/or financial difficulty would engage in greater alcohol and cannabis use—controlling for pre-pandemic levels of use—relative to those who did not experience job loss or financial difficulty, and (2) perceived control over these economic adversities would moderate the effect of job loss and financial difficulty, respectively, on changes in one's substance use behavior. Specifically, we anticipated that those with low perceived control would show increased substance use in response to adverse economic impacts, while those with high perceived control would not.

Method

Participants and Procedures

Participants for the current study were originally recruited for an ongoing longitudinal cohort study of young adult role transitions that began in 2015 (Lee et al., 2018; Patrick et al., 2020). Young adults in and around Seattle, WA, were recruited via print and online media advertisements, outreach to local community colleges, and via friend referral. On a rolling basis from February 2015 to January 2016, 778 young adults aged 18–23 were enrolled and instructed to complete monthly surveys for 24 months with an additional 30-month follow-up. Eligibility criteria entailed drinking alcohol at least one time in the past year and living within 60 miles of the study office (Seattle, WA). Participants from the original cohort were also invited to participate in a January 2020 follow-up survey for additional monitoring of young adult development and health behaviors ($N = 594$ opted-in to the January follow-up; 76.3% response rate of the original cohort). Then, to study young adults' health and well-being during the early stages of the COVID-19 pandemic, participants from the original cohort were invited to complete an additional follow-up survey in April and May 2020, referred to hereafter as Spring 2020 ($N = 552$ opted-in to the Spring 2020 follow-up: 71.0% response rate). Participation was incentivized by a $15 gift card at each timepoint, participants provided informed consent at each timepoint, and all aspects of this research received institutional review approval from the lead author's university. No adverse events were reported. In total, 519 participants recorded at least partial responses to both January 2020 and Spring 2020 surveys used here.

In the January 2020 survey, the analytic sample was now between the ages of 22 and 29 ($M_{age} = 25.4$ years; SD = 1.84) and comprised of 62.8% female. Pertaining to race/ethnicity, 54.6% identified as non-Hispanic (NH) White/Caucasian, 19.5% identified as NH Asian/Asian American, 4.3% identified as NH Black/African American, 8.3% identified as Hispanic, and 13.4% identified as NH Other or multiple race/ethnicities. As of January 2020, most of the sample (72.7%) had a bachelor's degree or higher and 93.4% reported having some form of employment.

Measures

Job Loss. In the Spring 2020 survey, participants were asked a check-all-that-apply item regarding potential job loss due to the COVID-19 pandemic: "*Please indicate whether any of these changes in your work situation have occurred as a result of the COVID-19 pandemic*." If a participant endorsed any form of job loss, they were scored "1," and if they did *not* endorse any job loss, they were scored "0" (see Table 1 for all response options).

Financial Difficulty. Participants were asked a check-all-that-apply item pertaining to potential financial difficulties because of the COVID-19 pandemic: "*As a result of the COVID-19 pandemic, have you had financial difficulties with any of the following*?" If a participant endorsed any of the financial difficulties, they were scored "1," and if they did *not* endorse any financial difficulties, they were scored "0" (see Table 1 for all response options).

Perceived Control. Two items were used to assess participants' perceived control over their work and financial situations, respectively. These items asked: "*Overall, in the past month how much control do you feel you had over your (work)/(financial) situation*?" Response options ranged from 0 (*no control*) to 3 (*complete control*). These two items were moderately correlated ($r = 0.46$, $p < 0.001$).

Substance Use Behaviors. Measures to assess alcohol and cannabis use were included in both the January 2020 and Spring 2020 surveys. Alcohol use was assessed in terms of frequency and heaviest use occasion in the past month. These were assessed using the quantity/frequency index (Marlatt et al., 1995). Frequency ranged from 0 days to every day in the past month, and heaviest drinking occasion ranged from 0 drinks to 25 + drinks. Cannabis use frequency was assessed using a single item in a similar format that asked: "*On how many occasions (if any) have you used marijuana (weed, pot) or hashish (hash, hash oil) during the last 30 days?*" Response options ranged from 0 (*0 occasions*) to 6 (*40 or more occasions*).

Annual Salary in 2019. In the Spring 2020, participants reported how much they earned in the 2019 calendar year: "*During all of the last calendar year (January 1 to December 31, 2019), how much did you yourself earn, before taxes*?" They were instructed to include only pay for work such as salary, wages, tips, and commission. Responses were on a 17-point scale ranging from $0 to $100,000 or more. This demographic variable

Table 1 Percent of sample endorsing job loss and financial difficulty in the Spring of 2020 as a result of the COVID-19 pandemic

Job loss stem: please indicate whether any of these changes in work situation have occurred as a result of the COVID-19 pandemic. Check all that apply	**Percent of sample [95% C.I.]**
1. Quit job	2.31% [1.02, 3.61]
2. Fired from job	0.39% [−0.15, 0.92]
3. Laid off from job	8.86% [6.42, 11.31]
4. Furloughed from job	4.62% [2.82, 6.43]
5. Went on leave from job	3.85% [2.20, 5.51]
6. Temporary or contract work ended	0.77% [0.02, 1.52]
Any job loss as a result of the COVID-19 pandemic	**18.88% [15.52, 22.25]**
Financial difficulty stem: as a result of the COVID-19 pandemic, have you had financial difficulties with any of the following? Check all that apply	**Percent of sample [95% C.I.]**
1. Cash-flow	23.12% [19.49, 26.75]
2. Saving money (e.g., for retirement, a house, and a trip)	28.90% [25.00, 32.80]
3. Ability to do the things I wanted to do financially (e.g., go to movies and go out to dinner with friends)	35.07% [30.96, 39.17]
4. Ability to pay bills (e.g., electricity, credit card, and rent/mortgage)	13.10% [10.20, 16.01]
5. Trying to secure loans (e.g., student loans, car loans, and mortgage)	4.24% [2.51, 5.97]
Any financial difficulty as a result of the COVID-19 pandemic	**49.71% [45.41, 54.01]**

was included as a covariate to control for how much participants earned prior to the COVID-19 pandemic.

Analyses

Multiple regression models estimated associations between substance use behaviors and job loss and financial difficulty (tested in separate models given concerns for multicollinearity). Pre-pandemic (January 2020) scores of each outcome were entered as covariates so that models controlled for individuals' starting values and thus modeled the residual variability in outcomes remaining after accounting for pre-pandemic levels (Vickers & Altman, 2001). Main effects for job loss/financial difficulty and perceived control of these domains were entered first, and then, interaction effects were estimated in a separate block (e.g., job loss × perceived control for work situation). Significant interactions were plotted to enhance interpretation and were further probed by estimating simple slopes for each effect (Jaccard & Turrisi, 1990).

Each substance use outcome variable reflected an underlying count scale which introduces complexities related to positive skew and potential overdispersion that can be addressed using negative binomial regression (Atkins & Gallop, 2007). In such models, coefficients are exponentiated to yield count ratios (CR) that are interpreted similar to odds ratios (i.e., CRs above 1 indicate a positive association and CR below 1 indicate an inverse association). In each regression model, we controlled for participant race/ethnicity, birth sex (0 = *female*; 1 = *male*), age as of January 2020, and annual salary in the year 2019.

Results

Preliminary Results

Table 1 lists the proportion of the sample that endorsed each response option regarding loss and financial difficulties. In total, 18.9% of the sample reported some form of job loss as a result of COVID-19 by Spring 2020, with the most common forms being laid off from job (8.9%) and being furloughed from job (3.9%). A logistic regression model revealed that job loss due to the COVID-19 pandemic was not significantly associated with race/ethnicity, birth sex, or age, but was associated with 2019 annual salary (OR = 0.92; $p < 0.001$) such that job loss was more frequently reported by those with lower annual salaries in 2019.

Nearly half of the sample reported some form of financial difficulty due to the COVID-19 pandemic (49.7%) with the most commonly endorsed options being difficulties doing things they wanted financially (35.1%) and difficulty saving money (28.9%). A logistic regression model revealed that financial difficulty due to the COVID-19 pandemic was not significantly associated with race/ethnicity, birth sex, or age, but was significantly more likely among those with lower 2019 annual salaries (OR = 0.94; $p = 0.003$).

Job Loss Models

The drinking frequency model (Table 2) revealed no main effects for either job loss or perceived control for one's work situation; however, there was a significant interaction indicating that the effect of job loss on alcohol use frequency depended on one's perceived control over the

Table 2 Regression models estimating associations between job loss due to the COVID-19 pandemic and past-month alcohol use behaviors in Spring 2020

	Drinking frequency	Heaviest drinking occasion	Cannabis use frequency
	CR [95% C.I.]	CR [95% C.I.]	CR [95% C.I.]
Covariates			
Race (White/Caucasian = reference)			
Asian/Asian American	0.73 [0.61, 0.87]***	0.62 [0.50, 0.76]***	0.72 [0.44, 1.19]
Hispanic/Latinx	0.77 [0.60, 0.99]*	0.74 [0.55, 0.99]*	0.83 [0.44, 1.64]
Other race/ethnicity	0.94 [0.80, 1.11]	1.00 [0.81, 1.23]	0.94 [0.56, 1.61]
Birth sex (0 = female; 1 = male)	0.94 [0.83, 1.06]	1.01 [0.86, 1.19]	1.24 [0.86, 1.80]
Age	0.98 [0.95, 1.02]	0.99 [0.95, 1.03]	0.95 [0.86, 1.05]
Annual salary in 2019	1.02 [1.00, 1.03]*	1.00 [0.98, 1.02]	0.98 [0.94, 1.01]
Pre-pandemic score on outcome (Jan. 2020)	1.27 [1.24, 1.31]***	1.16 [1.14, 1.19]***	1.16 [1.13, 1.19]***
Job loss due to COVID-19 pandemic (0 = no, 1 = yes)	1.12 [0.90, 1.40]	1.51 [1.14, 1.99]**	1.00 [0.53, 1.93]
Perceived control over work situation	1.00 [0.92, 1.08]	1.02 [0.92, 1.14]	0.79 [0.62, 1.00]
Interaction effect			
Job loss × perceived control over work situation	0.78 [0.63, 0.95]*	0.72 [0.55, 0.92]**	0.98 [0.60, 1.67]

Models control for pre-pandemic score on the outcome variable (January 2020), which enables interpretation as change in the outcome variable similar to residual change models, relative to pre-pandemic. *CR* count ratios, interpreted similarly to odds ratios (i.e., CR > 1 indicate positive association; CR < 1 indicate inverse associations)

*$p < 0.05$ **$p < 0.01$ ***$p < 0.001$

situation. Decomposing this interaction into simple slopes (Fig. 1a) shows that for those with relatively low perceived control, there was no significant effect of job loss on drinking frequency, but for those with relatively high perceived control, job loss was *inversely* associated with drinking frequency. That is, those who experienced job loss but had higher perceived control reported less frequent alcohol use, on average. For the model estimating associations with the heaviest drinking occasion, job loss was significantly related to heavier drinking. Moreover, this effect was moderated by perceived control, such that job loss was only associated with heavier drinking for those relatively low in perceived control (Fig. 1b). Cannabis use frequency was not significantly associated with job loss and the interaction

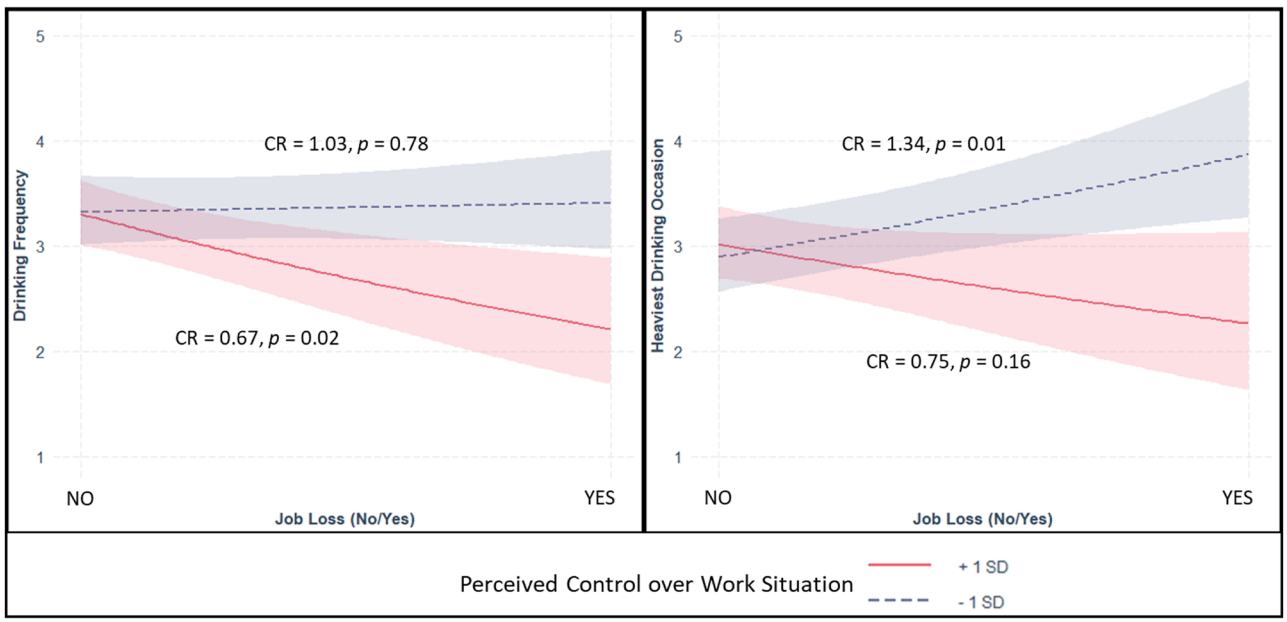

Fig. 1 Interactions and simple slopes for associations between job loss and **a** past month drinking frequency and **b** heaviest drinking occasion in the past month, moderated by perceived control over work situation. Bands around plots indicate 95% confidence intervals

Table 3 Regression models estimating associations between financial difficulties due to the COVID-19 pandemic and past-month alcohol use behaviors in Spring 2020

	Drinking frequency	Heaviest drinking occasion	Cannabis use frequency
	CR [95% C.I.]	CR [95% C.I.]	CR [95% C.I.]
Covariates			
Race (White/Caucasian = reference)			
Asian/Asian American	0.73 [0.61, 0.87]***	0.62 [0.50, 0.77]***	0.68 [0.42, 1.12]
Hispanic/Latinx	0.76 [0.59, 0.98]*	0.73 [0.54, 0.98]*	0.74 [0.40, 1.45]
Other race/ethnicity	0.98 [0.83, 1.15]	1.02 [0.83, 1.25]	0.98 [0.60, 1.65]
Birth sex (0 = female; 1 = male)	0.93 [0.82, 1.06]	1.00 [0.85, 1.17]	1.16 [0.81, 1.69]
Age	0.98 [0.95, 1.02]	0.99 [0.95, 1.03]	0.96 [0.86, 1.06]
Annual salary in 2019	1.02 [1.00, 1.03]*	1.00 [0.98, 1.02]	0.98 [0.94, 1.03]
Pre-pandemic score on outcome (Jan. 2020)	1.28 [1.24, 1.31]***	1.17 [1.14, 1.19]***	1.16 [1.13, 1.18]***
Financial difficulties due to COVID-19 pandemic (0 = no, 1 = yes)	1.38 [1.06, 1.80]*	1.72 [1.23, 2.42]**	1.37 [0.92, 2.05]
Perceived control over financial situation	1.13 [1.00, 1.27]*	1.10 [0.95, 1.28]	0.93 [0.73, 1.18]
Interaction effect			
Financial difficulties × perceived control over financial situation	0.77 [0.66, 0.91]**	0.75 [0.61, 0.91]**	0.61 [0.39, 0.95]*

Models control for pre-pandemic score on the outcome variable (January 2020), which enables interpretation as change in the outcome variable similar to residual change models, relative to pre-pandemic. *CR* count ratios, interpreted similarly to odds ratios (i.e., CR > 1 indicate positive association; CR < 1 indicate inverse associations)

*$p < 0.05$ **$p < 0.01$ ***$p < 0.001$

term was also non-significant, indicating the effect of job loss on cannabis use frequency did not differ as a function of perceived control.

Financial Difficulty Models

For the model estimating associations with drinking frequency (Table 3), significant main effects indicated more frequent drinking among those who endorsed having financial difficulty as well as a positive association with perceived control for one's financial situation. However, a significant interaction was detected indicating the association between drinking frequency and financial difficulty was moderated by perceived control. Simple slopes (Fig. 2a) show those who reported financial difficulty but were relatively high in perceived control drank less frequently.

The model for the heaviest drinking occasion revealed a significant main effect of financial difficulty in which those who endorsed financial difficulty reported heavier peak drinking occasions, on average. This effect was also

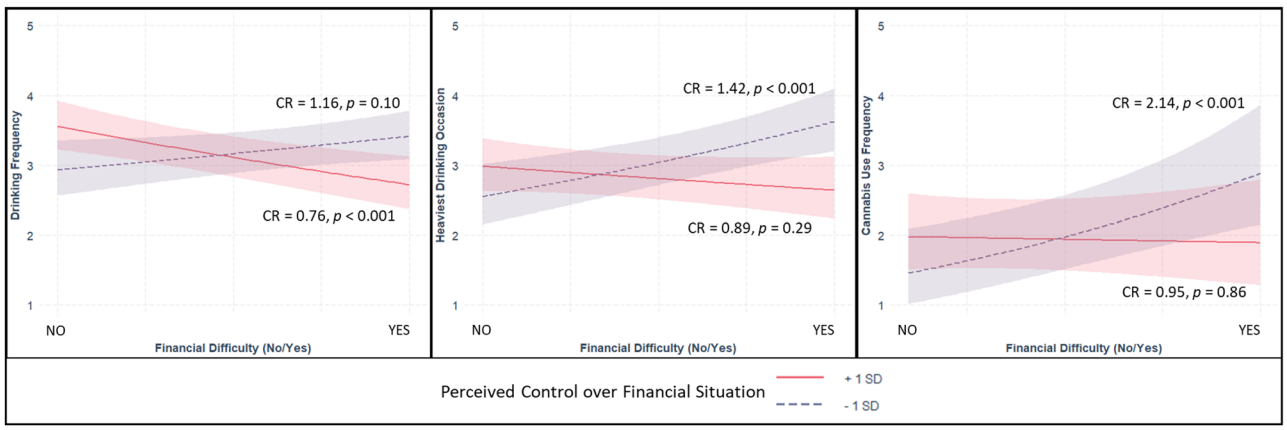

Fig. 2 Interactions and simple slopes for associations between financial difficulty and **a** past month drinking frequency, **b** heaviest drinking occasion in the past month, and **c** past month cannabis use frequency, moderated by perceived control over work situation. Bands around plots indicate 95% confidence intervals

moderated by perceived control; simple slopes (Fig. 2b) indicated that financial difficulty was only significantly associated with the heaviest drinking occasion for those who were relatively low in perceived control.

The cannabis frequency model revealed that financial difficulty was not significantly associated with cannabis use frequency. However, a significant interaction indicated the effect of financial difficulty on cannabis use frequency depended on one's perceived control. Decomposing this interaction via simple slopes (Fig. 2c) showed that there was indeed a significant positive association between financial difficulty and cannabis use frequency for those who were relatively low in perceived control, but there was no significant association between financial difficulty and cannabis use frequency for those who were relatively high in perceived control.

Discussion

Self-medication theory alongside developmental-contextual models of substance use highlights that increased alcohol or cannabis use may result in response to stressful or emotional events and situations, such as job loss and financial difficulties. For young adults specifically, these increases may be in response to heightened stress caused by threats to important developmental milestones (e.g., occupation, financial stability, or independence). The current study extends our understanding of pandemic-related health concerns by identifying perceived control as a critical factor in explaining the relationship between economic adversities and increased substance use among young adults. Given that work and finance-related life disruptions occurred at inordinately high rates among young adults during the beginning of the COVID-19 pandemic, data collected during this period offered a unique opportunity to test these associations. It is worth noting that at the time data were collected, the length and severity of the COVID-19 pandemic were not yet evident; thus, it is important to consider participants' perceptions as reported in April/May 2020.

Consistent with hypotheses, job loss and financial difficulty were associated with heavier peak drinking, controlling for pre-pandemic substance use. Unexpectedly, only financial difficulty, but not job loss, was associated with greater drinking frequency, whereas neither job loss nor financial difficulty was associated with cannabis use frequency, on average. Prior to the COVID-19 pandemic, findings from this sample showed that ending a job was not associated with increased alcohol use in a given month (Patrick et al., 2018). However, differences may be due to much higher rates of past-month job loss among this present subsample than rates of job loss reported prior to the pandemic (18.9% vs. 8.2%; Patrick et al., 2018) and/or because these transitions coincided with the beginning of COVID-19 outbreak that was associated with increased perceived stress and other mental health concerns among young adults broadly (Charles et al., 2020; Graupensperger et al., 2022; Graupensperger, Cadigan, et al. 2021a).

Moderation analyses generally supported the study hypotheses: Perceived control over one's work or financial situation moderated effects of economic impacts on substance use behaviors. Among young adults who reported relatively lower levels of perceived control, experiencing job loss and/or financial difficulty in the past month was associated with more drinks consumed during their heaviest drinking occasion and more frequent cannabis use, but not alcohol use frequency. Consistent with self-efficacy theorizing, young adults with low self-efficacy may have a lower ability to handle increased stress and/or lower overall coping capacity and are therefore at greater risk for increased heavy drinking when faced with negative life transitions. Alternatively, as unemployment takes a major toll on young adults' self-efficacy (Mortimer et al., 2016), the adverse economic impacts *themselves* might decrease perceived control and overall coping capacity, which in turn could increase substance use. As such, future work should also assess domain-specific perceived control before and after negative life transitions to further elucidate who may be at risk for increased substance use.

Conversely to the findings showing that *low* perceived control may be a risk factor, *higher* levels of perceived control appeared protective against increased substance use in the face of economic adversities. In fact, among young adults who experienced job loss, those with relatively higher domain-specific perceived control reported drinking *less* frequently than they had prior to the pandemic-related job loss. This is particularly striking given evidence in previously reported studies from this sample that young adults, on average, drank *more* frequently in Spring 2020, relative to January 2020 (pre-pandemic; Graupensperger, Fleming, et al. 2021). These findings may indicate that young adults who believe they have more control over work and financial life domains are better positioned to respond more adaptively after experiencing job loss or financial difficulty than those with lower perceived control, consistent with prior work linking higher levels of self-efficacy with greater resilience to stress (Prince-Embury & Saklofske, 2013) and preparedness for negative life events (Kuhnen & Melzer, 2018). However, it may also be possible that perceived control increased among individuals who were better handling their sudden unemployment or financial strain. Nevertheless, individuals with higher self-efficacy tend to rely more on active, problem-focused coping strategies (Terry et al., 1995). In line with this notion, results from the current study indicate that individuals with higher perceived control reduced substance use behaviors (i.e., cutting back on alcohol use)

that could potentially impede reemployment or improving financial status.

Cannabis use frequency findings were less robust than alcohol use findings. Specifically, financial difficulty was associated with increased cannabis use among young adults with low perceived control, whereas this interaction in the job loss model was non-significant. Young adults may be less likely to increase their cannabis use following job loss due to concerns over drug testing requirements for reemployment as new employees often undergo pre-employment drug testing. Regarding financial difficulty, preliminary evidence suggests that cannabis use (but not alcohol use) is longitudinally associated with lower self-efficacy among young adults (Lac & Luk, 2018); therefore, it may be that regular cannabis users with consistently lower perceived control may be more susceptible to increasing their cannabis use in response to negative life transitions. Importantly, increased cannabis use and the cost of purchasing cannabis could also contribute to the maintenance of financial stress by reducing available funds.

Prevention Implications

Findings from the current study have important clinical implications that may expand beyond the context of COVID-19. Results from the current study suggest that increasing perceptions of personal agency could be an important target for prevention and intervention efforts, as high perceived control appeared protective against increased substance use, whereas low perceived control presented as a risk factor. Critically, a growing body of work suggests that both general and domain-specific self-efficacy are malleable psychosocial factors that can be increased through intervention. For example, a self-efficacy training for adults increased general self-efficacy and reemployment rates among individuals with lower self-efficacy at baseline (Eden & Aviram, 1993), with other, more targeted interventions showing similar effects for increases in job search self-efficacy (Liu et al., 2014).

Young adults facing adverse life events may benefit from treatment efforts aimed at increasing self-efficacy, including perceived control, at both the domain-specific and general levels. In addition to increasing coping capability, prevention efforts may also want to focus work on building personal agency beliefs starting from a younger age, which could preemptively increase resilience to life transitions and in turn decrease the likelihood of using substances to cope with adverse life events. However, as Bandura (2001) suggests, people do not always have direct control over the events and circumstances affecting their lives and, in such cases, people can exercise *proxy agency* in which they can take indirect action (e.g., asking others for help) to reach a desirable outcome. Nevertheless, one's ability and willingness to seek assistance is limited by available resources; thus, prevention may start at the policy level by establishing effective "safety nets" people can rely on when faced with such adversities (e.g., adequate unemployment programs). In the context of the current study, building one's perceived control may also include teaching young people to utilize resources (e.g., mentors, friends, and agencies) as an important aspect of personal agency, but also pertains to the need for policy structures that ensure individuals who are struggling have readily available resources to depend on.

A more general message from the present study was the sheer prevalence of COVID-19-related job loss (nearly one-in-five) and financial difficulty (nearly half) among young adults. Understanding the short- and long-term effects of these impacts will be important. This cohort of young adults may suffer from long-term career trajectory impacts from having this type of disruption early in their working lives. In addition, their perceived control about these aspects of their lives may be impacted in the future, as too might be their proclivity to use substances when faced with adverse life events.

Limitations

Several limitations warrant consideration when interpreting the present findings. First, the sample cohort was recruited from one metropolitan area of the US, so findings may not generalize to other countries or even regions in the US (e.g., rural populations), especially as it pertains to varying policies and available assistance programs such as unemployment. Relatedly, the sample was representative of the region where data were collected, but nevertheless had limited diversity for ethnic/racial minorities. Domain-specific perceived control, as currently assessed, reflects one's beliefs about personal agency, but is only one component of self-efficacy. More rigorous assessment of self-efficacy in future studies could further aid our understanding of risk/protective factors for economic adversities. Alongside the strength of assessing substance use behaviors both pre-pandemic and during the early stages of the pandemic, perceived control, job loss, and financial difficulties were all reported concurrently; thus, temporal ordering and causal impacts cannot be determined. Relatedly, young adults may have begun facing stressors even prior to COVID-19 being declared a pandemic, which may have facilitated increased substance use before experiencing economic adversities (Einberger et al., 2021). Despite the COVID-19 pandemic providing a unique opportunity to examine job loss and financial difficulty, it is possible that circumstances surrounding the pandemic contributed to the findings such that results may not fully generalize to non-pandemic-related job loss and financial difficulties. Thus, it is necessary to further test these research questions as they may pertain to other events with widespread financial adversity (e.g., in the context of

an economic recession) and to test if these effects would be replicated during times of societal normalcy. Moreover, we controlled for participants' salary in the analytic models, but it is nevertheless possible that COVID-19-related life transitions disproportionately affected certain job tiers more than others (e.g., lower paying service industry jobs). Although prevalence rates of job loss were nearly double the prevalence of job loss prior to the pandemic (Patrick et al., 2018), it was reported by a smaller subset of the overall sample, and given the pandemic was unexpected, we were only able to use the sample that we had which may be underpowered. Future work should test if these results replicate among samples with a higher rate of job loss. Ultimately, as with any study that builds psychological theory, we encourage replication—specifically, outside of the pandemic context.

Conclusions

The current study builds our understanding of how economic adversities may relate to substance use behaviors among young adults by identifying perceived control, a component of self-efficacy, as a protective/risk factor, as it pertains to substance use behaviors. Specifically, the extent to which young adults who lost their jobs increased or decreased their alcohol use behavior was largely dependent on whether they were high or low in perceived control about their employment: Those low in perceived control increased peak drinking, while those high in perceived control *decreased* alcohol use frequency. These findings regarding the protective role of perceived control were similar as it pertained to experiencing financial difficulty; however, unlike job loss, those low in financial perceived control also significantly increased the use of cannabis. Taken together, findings show the practical value in building aspects of young peoples' perceived self-efficacy over domains in their life in which they may someday experience adversities.

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Data Availability Data are available upon request.

Declarations

Ethical Approval All aspects of the present study were approved by the Institutional Review Board at the University of Washington. No adverse events were reported. The study was performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments.

Disclaimer The content of this manuscript is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

Consent to Participate All participants completed informed consent.

Conflict of Interest The authors declare no conflict of interests.

References

Atkins, D. C., & Gallop, R. J. (2007). Rethinking how family researchers model infrequent outcomes: A tutorial on count regression and zero-inflated models. *Journal of Family Psychology, 21*, 726–735. https://doi.org/10.1037/0893-3200.21.4.726

Bandura, A. (1989). Human agency in social cognitive theory. *American Psychologist, 44*, 1175–1184. https://doi.org/10.1037/0003-066X.44.9.1175

Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology, 52*, 1–26.

Cadigan, J. M., Fleming, C. B., Patrick, M. E., Lewis, M. A., Rhew, I. C., Abdallah, D. A., et al. (2021). Negative evaluation of role transitions is associated with perceived stress and alcohol consequences: examination of the transitions overload model in young adulthood using two years of monthly data. *Alcoholism: Clinical and Experimental Research*, Ahead of Print. https://doi.org/10.1111/acer.14636

Carliner, H., Mauro, P. M., Brown, Q. L., Shmulewitz, D., Rahim-Juwel, R., Sarvet, A. L., et al. (2017). The widening gender gap in marijuana use prevalence in the U.S. during a period of economic change, 2002–2014. *Drug and Alcohol Dependence, 170*, 51–58. https://doi.org/10.1016/j.drugalcdep.2016.10.042

Charles, N., Strong, S. J., Burns, L. C., Bullerjahn, M. R., & Serafine, K. M. (2020). Increased mood disorder symptoms, perceived stress, and alcohol use among college students during the COVID-19 pandemic. *PsyArXiv*, Pre-Print.

Compton, W. M., Gfroerer, J., Conway, K. P., & Finger, M. S. (2014). Unemployment and substance outcomes in the United States 2002–2010. *Drug and Alcohol Dependence, 142*, 350–353. https://doi.org/10.1016/j.drugalcdep.2014.06.012

Eden, D., & Aviram, A. (1993). Self-efficacy training to speed reemployment: Helping people to help themselves. *Journal of Applied Psychology, 78*, 352–360. https://doi.org/10.1037/0021-9010.78.3.352

Einberger, C., Graupensperger, S., & Lee, C. M. (2021). Young adults' physical distancing behaviors during the initial months of the COVID-19 pandemic: Adherence to guidelines and associations with alcohol use behavior. *Emerging Adulthood*. https://doi.org/10.1177/21676968211004679

Frone, M. R. (2016). The great recession and employee alcohol use: a U.S. population study. *Psychology of Addictive Behaviors*, *30*(2), 158–167. https://doi.org/10.1037/adb0000143

Graupensperger, S., Fleming, C. B., Jaffe, A. E., Rhew, I. C., Patrick, M. E., & Lee, C. M. (2021b). Changes in young adults' alcohol and marijuana use, norms, and motives from before to during the COVID-19 pandemic. *Journal of Adolescent Health*, Ahead of Print. https://doi.org/10.1016/j.jadohealth.2021.01.008

Graupensperger, S., Cadigan, J. M., Einberger, C., & Lee, C. M. (2021a). Multifaceted COVID-19-related stressors and associations with indices of mental health, well-being, and substance use among young adults. *International Journal of Mental Health and Addiction*, Ahead of Print.

Graupensperger, S., Calhoun, B. H., Patrick, M. E., & Lee, C. M. (2022). Longitudinal effects of COVID-19-related stressors on young adults' mental health and well-being. *Applied Psychology: Health and Well-being*, Ahead of Print. https://doi.org/10.1111/aphw.12344

Hawes, M. T., Szenczy, A. K., Klein, D. N., Hajcak, G., & Nelson, B. D. (2021). Increases in depression and anxiety symptoms in adolescents and young adults during the COVID-19 pandemic. *Psychological Medicine*, 13–21. https://doi.org/10.1017/S0033291720005358

Helppie-Mcfall, B., & Mcardle, J. J. (2011). Crash and wait? The impact of the Great Recession on retirement planning of older Americans. *American Economic Review, 101*(3), 40–44

Jaccard, J., & Turrisi, R. J. (1990). *Interaction effects in multiple regression.* Newbury Park, CA: SAGE.

Khantzian, E. J. (1997). The self-medication hypothesis of substance use disorders: A reconsideration and recent applications. *Harvard Review of Psychiatry, 4*, 231–244

Kochnar, R. (2020). Unemployment rose higher in three months of COVID-19 than it did in two years of the Great Recession. *Pew Research Center*, 11 June 2020.

Kuhnen, C. M., & Melzer, B. T. (2018). Noncognitive abilities and financial delinquency: The role of self-efficacy in avoiding financial distress. *Journal of Finance, 73*, 2837–2869. https://doi.org/10.1111/jofi.12724

Kuntsche, E., Knibbe, R., Gmel, G., & Engels, R. (2005). Why do young people drink? A review of drinking motives. *Clinical Psychology Review, 25*, 841–861. https://doi.org/10.1016/j.cpr.2005.06.002

Lac, A., & Luk, J. W. (2018). Testing the amotivational syndrome: Marijuana use longitudinally predicts lower self-efficacy even after controlling for demographics, personality, and alcohol and cigarette use. *Prevention Science, 19*, 117–126. https://doi.org/10.1007/s11121-017-0811-3

Lane, J. A., Leibert, T. W., & Goka-Dubose, E. (2017). The impact of life transition on emerging adult attachment, social support, and well-being: A multiple-group comparison. *Journal of Counseling and Development, 95*, 378–388. https://doi.org/10.1002/jcad.12153

Lee, C. M., Cadigan, J. M., Fairlie, A. M., & Lewis, M. A. (2018). Transitions into young adulthood: Extent to which alcohol use, perceived drinking norms, and consequences vary by education and work statuses among 18–20 year olds. *Addictive Behaviors, 79*, 107–112. https://doi.org/10.1016/j.addbeh.2017.12.004

Liu, S., Huang, J. L., & Wang, M. (2014). Effectiveness of job search interventions: A meta-analytic review. *Psychological Bulletin, 140*, 1009–1041. https://doi.org/10.1037/a0035923

Mahmoud, J. S. R., Staten, R. T., Hall, L. A., & Lennie, T. A. (2012). The relationship among young adult college students' depression, anxiety, stress, demographics, life satisfaction, and coping styles. *Issues in Mental Health Nursing, 33*, 149–156. https://doi.org/10.3109/01612840.2011.632708

Marlatt, G. A., Baer, J. S., & Larimer, M. E. (1995). Preventing alcohol abuse in college students: a harmreduction approach. In G. M. Boyd, J. Howard, & R. A. Zucker (Eds.), *Alcohol problems among adolescents.* (pp. 147–172). Northvale, NV: Lawrence Earlbaum.

Menasce Horowitz, J., Brown, A., & Minkin, R. (2021). A year into the pandemic, long-term financial impact weighs heavily on many Americans. *PEW Research Center*. https://www.pewresearch.org/social-trends/2021/03/05/a-year-into-the-pandemic-long-term-financial-impact-weighs-heavily-on-many-americans/

Mortimer, J. T., Kim, M., Staff, J., & Vuolo, M. (2016). Unemployment, parental help, and self-efficacy during the transition to adulthood. *Work and Occupations, 43*, 434–465. https://doi.org/10.1177/0730888416656904

Mulia, N., Zemore, S. E., Murphy, R., Liu, H., & Catalano, R. (2014). Economic loss and alcohol consumption and problems during the 2008 to 2009 U.S. recession. *Alcoholism: Clinical and Experimental Research*, *38*(4), 1026–1034. https://doi.org/10.1111/acer.12301

Newman, B. M., & Newman, P. R. (2008). *Development through life: A psychosocial approach*. Wadsworth

Osgood, D. W., Ruth, G., Eccles, J. S., Jacobs, J. E., & Barber, B. L. (2005). Six paths to adulthood: Fast starters, parents without careers, educated partners, educated singles, working singles, and slow starters. In R. A. Settersten, F. F. Furstenberg, & R. G. Rumbaut (Eds.), *On the frontier of adulthood: Theory, research, and public policy* , 320–355. The University of Chicago Press

Patrick, M. E., Rhew, I. C., Lewis, M. A., Abdallah, D. A., Larimer, M., Schulenberg, J. E., & Lee, C. M. (2018). Alcohol motivations and behaviors during months young adults experience social role transitions: micro-transitions in early adulthood. *Psychology of Addictive Behaviors*, *32*, 895–903.https://doi.org/10.1037/adb0000411

Patrick, M. E., Rhew, I. C., Duckworth, J. C., Lewis, M. A., Abdallah, D. A., & Lee, C. M. (2020). Patterns of young adult social roles transitions across 24 months and subsequent substance use and mental health. *Journal of Youth and Adolescence, 49*, 869-880. https://doi.org/10.1007/s10964-019-01134-8

Prince-Embury, S., & Saklofske, D. H. (2013). *Resilience in children, adolescents, and adults: Translating research into practice*. The Springer Series on Human Exceptionality

Schulenberg, John E, Ph, D., Maggs, J. L., & Ph, D. (2002). A developmental perspective on alcohol use and heavy drinking during adolescence and the transition to young adulthood. *Journal of Studies on Alcohol and Drugs*, *Supplement*, 54–70

Schulenberg, J. E., O'Malley, P. M., Bachman, J. G., & Johnston, L. D. (2005). Early adult transitions and their relation to well-being and substance use. In F. Furstenberg, R. Rumbaut, & R. Settersten (Eds.), *On the frontier of adulthood.* Chicago, IL.

Settersten, R. A. (2007). The new landscape of adult life: Road maps, signposts, and speed lines. *Research in Human Development, 4*, 239–252. https://doi.org/10.1080/15427600701663098

Shanahan, L., Steinhoff, A., Bechtiger, L., Murray, A. L., Nivette, A., Hepp, U., et al. (2020). Emotional distress in young adults during the COVID-19 pandemic: evidence of risk and resilience from a longitudinal cohort study. *Psychological Medicine*, 1–10. https://doi.org/10.1017/S003329172000241X

Shanahan, M. J., Porfeli, E. J., Mortimer, J. T., & Erickson, L. D. (2005). Subjective age identity and the transition to adulthood: When do adolescents become adults? In R. A. Settersten, F. F. Furstenberg, & R. G. Rumbaut (Eds.), *On the frontier of adulthood: Theory, research, and public policy* (pp. 225–255). The University of Chicago Press

Swift, S. L., Elfassy, T., Bailey, Z., Florez, H., Feaster, D. J., Calonico, S., et al. (2020). Association of negative financial shocks during the Great Recession with depressive symptoms and substance use in the USA: The CARDIA study. *Journal of Epidemiology and Community Health, 74*(12), 995–1001. https://doi.org/10.1136/jech-2020-213917

Terry, D. J., Tonge, L., & Callan, V. J. (1995). Employee adjustment to stress: The role of coping resources, situational factors, and coping responses. *Anxiety, Stress, & Coping, 8*, 1–24. https://doi.org/10.1080/10615809508249360

Vickers, A. J., & Altman, D. G. (2001). Analysing controlled trials with baseline and follow up measurements. *British Medical Journal, 323*, 1123–1124