



Resilience and grit predict fewer academic and career concerns among first-year undergraduate students during COVID-19

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Abstract

Since March 2020, the COVID-19 pandemic has profoundly disrupted higher education in the United States (U.S.). During the first wave of infection and hospitalization, many universities and colleges transitioned classroom instruction to online or a hybrid format. In September 2021, classes largely returned to in-person after the COVID-19 vaccine was widely available and, in some cases, mandated on university and college campuses across the U.S. In the current research, first-year undergraduate students answered a series of questions about their resilience, grit, and perceived academic and career impacts from the ongoing COVID-19 pandemic in Spring (February/March - May) 2021 and 2022. Findings from a series of regression analyses showed that grit and resilience seemed to protect students and help them stay on track, even in the face of the global pandemic. Undergraduate students who reported higher levels of grit and resilience were less likely to worry about job opportunities shrinking as well as less likely to report changing their academic goals, career goals, and proposed major. Future directions and implications are discussed.

Keywords Academic concerns · COVID-19 pandemic · Grit · Psychosocial factors · Resilience

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Since March 2020, the COVID-19 pandemic has profoundly disrupted higher education in the United States (U.S.). As the COVID-19 pandemic spread, by late March 2020, approximately 1,102 universities and colleges in the U.S. had moved their classes online (Johnson Hess, 2020). Initially the shift to online education was purported to be temporary, as universities and colleges moved operations online for an initial two-week period. However, as the COVID-19 pandemic rapidly evolved, by early April 2020, many institutions of higher education realized the shift to online education would likely be longer, at least through the rest of the semester or term. In reality, hundreds of universities and colleges did not transition back to majority in-person classes until Fall 2021, when vaccinations were more readily available and in some cases had been mandated on campus.

In addition to the shift to online education, COVID-19 caused a profound reckoning among undergraduate students in terms of their career goals and perceptions of career opportunities. In the midst of the first wave of COVID-19 infections in the U.S., during April 2020, 1,500 undergraduate students were asked about their experiences and expectations as a result of the pandemic. 40% of students reported having lost a job, an internship, or an offer of a job or internship as a result of the COVID-19 pandemic. Roughly one third (29%) of undergraduate students reported expecting to earn less at age 35 as a result of the pandemic (Aucejo et al., 2020). In another survey about the COVID-19 pandemic, conducted in Spring 2020, more than one third of undergraduate students reported feeling less certain about their future educational plans (Usher et al., 2021).

Challenges and stressors are a normal part of the college experience, however, the existence of a global pandemic has likely exacerbated an already challenging and stressful time for many. For example, a growing body of research suggests that depression and anxiety symptoms increased among adolescents and young adults in the midst of the COVID-19 pandemic (Hawes et al., 2021). Although this global pandemic likely impacted all students in the U.S. in some way, there may be individual differences in students' perceptions and responses to the pandemic. For instance, psychosocial factors, such as resilience and grit may serve as protective factors for students during times of heightened stress and uncertainty. Grit and resilience have been associated with academic outcomes such as engagement and retention, and identified as important psychosocial variables during times of transition (Lytle & Shin, 2020; 2022; Galatzer-Levy et al., 2012; Good et al., 2012; Leslie et al., 2015). Given the ongoing global disruptions to academic and career outcomes as result of the COVID-19 pandemic, a better understanding of potentially protective psychosocial factors is essential.

1 Grit

Grit is perseverance and passion for long-term goals (Duckworth et al., 2007). The concept of grit taps into something not captured by other traditional predictors of success, representing a unique construct as demonstrated by a burgeoning body of research (Duckworth & Quinn, 2009). For example, in Duckworth and colleagues' (2007) seminal paper on the concept, grit predicted several academic outcomes such

as educational outcomes among undergraduate students at elite universities and the rankings of National Spelling Bee contestants. Grit was also associated with a number of career changes among adults, such that high levels of grit predicted fewer career changes (Duckworth & Quinn, 2009).

Past research illustrates that grit was predictive of academic and career outcomes above and beyond IQ, self-control, and personality traits such as conscientiousness (Duckworth et al., 2007; Duckworth & Quinn, 2009; Duckworth & Gross, 2014). Whereas, more recent research has explored grit as a non-cognitive variable predictive of performance in academic domains (Fosnacht et al., 2019). Other findings from the literature include a positive relationship between grit, engagement, and academic productivity (Filmore, 2015; Hodge et al., 2018) and grit as a predictor of academic engagement among college students (Lytle & Shin; 2022; Fosnacht et al., 2019; Hunter, 2020).

In the wake of the COVID-19 pandemic, a slew of new research exploring the psychological effects as a result of lockdowns and social isolation, daily changes to routine, health concerns related to COVID-19, and more emerged (Killgore et al., 2020). For example, in one study conducted among Japanese adults during July 2020, grit had a buffering effect on the relationship between psychological distress and fear of COVID-19 (Masuyama et al., 2022). In another study, grit had indirect effects on social and well-being outcomes among individuals in the U.S. and the Philippines (Datu & Fincham, 2022). Similarly, high pandemic-related stress was associated with lower grit among undergraduate students from different colleges and universities across the U.S. (Schmahl & Nguyen, 2022).

The potential relationship between grit and academic outcomes as a result of the ongoing COVID-19 pandemic are less well understood. A recent study, which examined grit in the context of the pandemic during Spring 2020, found that grit predicted significantly greater pandemic resilience and marginally lower psychological impact among undergraduate students (Bono et al., 2020). In a study of nursing students, which explored challenges and difficulties during COVID-19, grit and resilience were factors that emerged as important to success in nursing programs (Munn et al., 2022).

2 Resilience

Resilience is the ability to bounce back after a difficult situation or experience. Resilient individuals adapt easily and quickly adjust to stressful situations as well as major life events (Beasley et al., 2003; Loh et al., 2014). Much of the work on resilience has examined this psychosocial variable in the context of real-world events. For example, after natural disasters, resilience is a significant protective factor against mental health disorders such as depression and PTSD and is associated with general health (Kukihara et al., 2014). Past research has explored the onset and offset of psychological issues in the wake of disasters, demonstrating that resilience is a common post-disaster outcome (Goldmann & Galea, 2014). Resilience does not indicate the lack of psychological symptoms after exposure to or experiencing a traumatic event,

however, it does involve the ability to rebound to traumatic or challenging events (Klein et al., 2003).

The study of resilience has also been applied to academic contexts, such that resilience has been identified as an important factor in engagement and retention. The ability to adapt and demonstrate flexibility in new environments may be especially important among undergraduate students during the transition to university (Galatzer-Levy et al., 2012). For example, resilience was a significant positive predictor of college adjustment for first-year students in the U.S. (Haktanir et al., 2021). During the transition to college, students encounter various challenges such as increased academic pressures, changes in one's social support system including the need to develop new relationships, increased personal responsibility, and changes to one's environment (Galatzer-Levy et al., 2012; Vaez & LaFlamme, 2008).

In the early days of the COVID-19 outbreak in the U.S., resilience was identified as a key factor for coping with the ensuing change, uncertainty, and hardship brought on by the pandemic (Liu et al., 2020; Killgore et al., 2020). In a cross-sectional study which examined protective and risk factors for mental health among young adults in the U.S. between April and May 2020, resilience emerged as a protective factor for mental health (Liu et al., 2020). Similarly, higher rates of resilience were associated with lower worry about the impacts of COVID-19 (Killgore et al., 2020). In another study, conducted in Colombia during June 2020, undergraduate and post-graduate students with higher levels of resilience were less susceptible to COVID-19's impact on mental health (Paredes et al., 2021).

3 Current research

The current study extends existing research on grit and resilience, examining how these concepts may serve as protective factors for undergraduate students during the heightened stress and uncertainty due to the COVID-19 pandemic. More specifically, this novel study examines whether grit and resilience predict perceived COVID-19 impacts on academic and career outcomes. Building on the existing literature on grit and resilience, we hypothesize that undergraduate students' self-reported grit and resilience will predict fewer perceived impacts due to the COVID-19 pandemic. More precisely, greater levels of grit will predict fewer academic goal changes (H1a), career goal changes (H1b), major changes (H1c), and less career opportunities concerns (H1d). Similarly, greater levels of resilience will predict fewer academic goal changes (H2a), career goal changes (H2b), major changes (H2c), and less career opportunities concerns (H2d).

4 Method

4.1 Participants

Spring 2021: A total of 667 first-year undergraduate students (women=235, men=426, gender identity not listed=6; $M_{\text{age}}=18.57$, $SD_{\text{age}} = 0.73$) from a private

university in the U.S. completed the survey between March - May, 2021. Stevens Institute of Technology is located in the Northeastern U.S. with approximately 4,000 undergraduate students in total. The current research was conducted among first-year students of which there are approximately 1,000 each year. The majority of students major in STEM and the gender split is approximately 70% men and 30% women. Participants were racially and ethnically diverse with 55.6% of participants being European American/White, 16.0% East Asian, 10.3% South Asian, 12.6% Latino/Hispanic, 0.7% African American/Black, 0.7% Native American/American Indian/Alaskan Native, 3.6% other or mixed race, and 0.7% missing response. Consistent with exclusion criteria used in previous research (Lytle & Shin, 2020; 2022), a total of 34 participants were removed for completing the survey in fewer than 3 min or longer than 90 min, resulting in a final sample of 633 participants. The average completion time for the survey was 10.27 min.

Spring 2022: A total of 797 first-year undergraduate students (women=274, men=514, gender identity not listed=9; $M_{age}=18.58$, $SD_{age}=1.11$) completed the survey between February - May, 2022. Participants were racially and ethnically diverse with 52.2% of participants being European American/White, 12.5% East Asian, 9.5% South Asian, 15.3% Latino/Hispanic, 2.5% African American/Black, 0.4% Native American/American Indian/Alaskan Native, 5.9% other or mixed race, and 1.6% missing response. Consistent with exclusion criteria used in previous research (Lytle & Shin, 2020; 2022), a total of 58 participants were removed for completing the survey in fewer than 3 min or longer than 90 min, resulting in a final sample of 739 participants. The average completion time for the survey was 10.97 min.

4.2 Procedure

Participants were recruited via a university subject pool. All first-year students participate in the subject pool and thus the participants are not restricted to social science students or social science majors (e.g., psychology; as is common in many subject pools). Students who do not want to participate in research have the option of completing alternative assignments, although less than 2% opt to complete the alternative assignments.

Approximately 1,000 eligible participants are part of the subject pool each academic year. Students are able to choose different studies to complete. In both Spring (February/March - May) 2021 and 2022, interested participants were directed to a secure website, Qualtrics, to complete a survey about "Careers." Participants were told that we were interested in their "attitudes and beliefs about their careers." If participants consented, they were given access to the survey and completed the measures during a single time point. In addition to the psychosocial variables of interest (grit and resilience) and questions about perceived academic and career impacts given the ongoing pandemic, participants also reported their age, gender, and race/ethnicity. The university's institutional review board approved this research prior to data collection.

4.3 COVID-19 context in Spring 2021 and 2022

The context of the COVID-19 pandemic was different in Spring 2021 and Spring 2022. In Spring 2021, the majority of classes at Stevens Institute of Technology were still being conducted online or in a hybrid format. Partway through Spring 2021, vaccines became widely available in the U.S. For example, by April 15, 2021, almost all U.S. states had made COVID-19 vaccines eligible to adults 16+. In Spring 2022, nearly all classes had returned to in-person instruction and a vaccine mandate was in place on campus.

4.4 Measures

4.4.1 Grit

An 8-item measure of grit (Duckworth & Quinn, 2009) was used to assess participants' passion for long-term goals and ability to persevere. The response options ranged from 1 (*Very much like me*) to 5 (*Not much like me at all*; $\alpha=0.75$) on a 5-point scale. Sample items included: "I often set a goal but later choose to pursue a different one" and "I have difficulty maintaining my focus on projects that take more than a few months to complete." Four of the items were reverse coded (e.g., "Setbacks don't discourage me" and "I am a hard worker") such that higher scores indicated more grit.

4.4.2 Resilience

A 10-item measure of resilience (Connor & Davidson, 2003) was used to assess participants' resiliency. Using a 5-point scale, the response options ranged 0 (*Not true at all*) to 4 (*True nearly all the time*; $\alpha=0.90$). Sample items included: "I can deal with whatever comes my way," "Under pressure, I stay focused and think clearly," and "I tend to bounce back after illness, injury or other hardships." Higher scores indicated greater resilience.

4.4.3 COVID-19 Academic and Career Impacts

Participants' were asked four questions about their perceived academic and career impacts due to the ongoing COVID-19 pandemic. Participants were asked, "Are you concerned about job opportunities shrinking as a result of the ongoing COVID-19 pandemic?" on a 5-point scale (*not at all* to *extremely*). In addition, participants were asked, "As a result of the ongoing COVID-19 pandemic, have any of the following changed?" with three categories: "My academic goals," "My career goals," and "My proposed major" on a 5-point scale (*did not change at all* to *completely changed*).

4.4.4 Analysis overview

All the analyses were performed using SPSS (version 28). Given the significant changes from Spring 2021 to Spring 2022 in COVID-19 vaccine availability, public health guidelines, and the return to in-person learning, prior to the main hypothesis testing, differences in the major study variables (i.e., four perceived academic and career impacts variables) between Spring 2021 and Spring 2022 cohorts were examined. A multivariate analysis of variance (MANOVA) was used for this analysis as it allows simultaneous examination of group differences on multiple dependent variables. The MANOVA was followed up with a series of univariate analysis of variance (ANOVA) to determine which of the four perceived academic and career impacts variables the Spring 2021 and Spring 2022 participants differed on. Furthermore, to examine potential demographic (gender, race, and age) differences between Spring 2021 and Spring 2022 participants, chi-square tests and a t-test were conducted.

To test the main hypotheses that grit and resilience would predict fewer perceived academic and career impacts due to the ongoing COVID-19 pandemic, a series of regression analyses were performed with grit and resilience separately as predictors and the four perceived academic and career impacts variables as the outcome variables.

5 Results

Table 1 presents the means, standard deviations, and correlations among the study variables separately for Spring 2021 and Spring 2022 participants. A MANOVA was conducted to examine the differences in perceived academic and career impacts of the pandemic between Spring 2021 and Spring 2022 participants while controlling for race as a chi-square test revealed a significant difference in race between these cohorts, $\chi^2(6, N=1357)=14.38, p=.026$. No other demographic differences were found (gender: $\chi^2(2, N=1372)=0.13, p=.94$; age: $t(1370)=-0.46, p=.65, d=0.03$).

The overall MANOVA was significant, Pillais' Trace=0.12, $F(4, 1345)=44.65, p<.001, \eta^2=0.12$. A series of follow-up univariate analysis of variance (ANOVA) revealed that Spring 2022 participants were less concerned about job opportunities shrinking as a result of the ongoing pandemic ($M=4.20, SD=1.00$) than Spring 2021 participants ($M=4.85, SD=1.19$), $F(1, 1348)=125.61, p<.001, \eta^2=0.09$ (see Fig. 1). However, Spring 2022 participants were more likely to report changing their career goals ($M=1.68, SD=1.04$) (see Fig. 2) and proposed major ($M=1.55, SD=1.04$) (see Fig. 3) due to the pandemic compared to Spring 2021 participants (career goals: $M=1.53, SD=0.99, F(1, 1348)=7.33, p<.01, \eta^2=0.01$; proposed major: $M=1.28, SD=0.76, F(1, 1348)=28.67, p<.001, \eta^2=0.02$). There was no significant difference in the self-reported changes in the academic goals between Spring 2021 ($M=1.71, SD=1.07$) and Spring 2022 ($M=1.74, SD=1.07$) participants, $F(1, 1348)=0.22, p=.64, \eta^2=0.00$ (see Fig. 4).

To test the main hypothesis that grit and resilience would serve as protective factors against perceived academic and career impacts from the pandemic, a series of regression analyses were conducted. Findings showed that higher levels of grit was

Table 1 Correlations, Means, and Standard Deviations for All Study Variables

Variables	1 Grit	2 Resilience	3 Career Concerns	4 Academic Goals Change	5 Career Goals Change	6 Proposed Major Change
Scale Range	1–5	1–5	1–5	1–5	1–5	1–5
Spring 2021 (n = 633)						
1	-	-	-	-	-	-
2	.46***	-	-	-	-	-
3	-.08	-.04	-	-	-	-
4	-.13**	-.17***	.15***	-	-	-
5	-.12**	-.10*	.16***	.66***	-	-
6	-.07	-.08	.07	.42***	.58***	-
M	3.17	3.74	2.85	1.71	1.53	1.28
SD	0.65	0.63	1.18	1.07	0.99	0.76
Spring 2022 (n = 739)						
1	-	-	-	-	-	-
2	.38***	-	-	-	-	-
3	-.09*	-.19***	-	-	-	-
4	-.19***	-.14***	.22***	-	-	-
5	-.15***	-.14***	.28***	.65***	-	-
6	-.13***	-.19***	.21***	.54***	.75***	-
M	3.19	3.72	2.20	1.73	1.68	1.54
SD	0.60	0.70	1.00	1.07	1.04	1.04

* $p < .05$; ** $p < .01$; *** $p < .001$

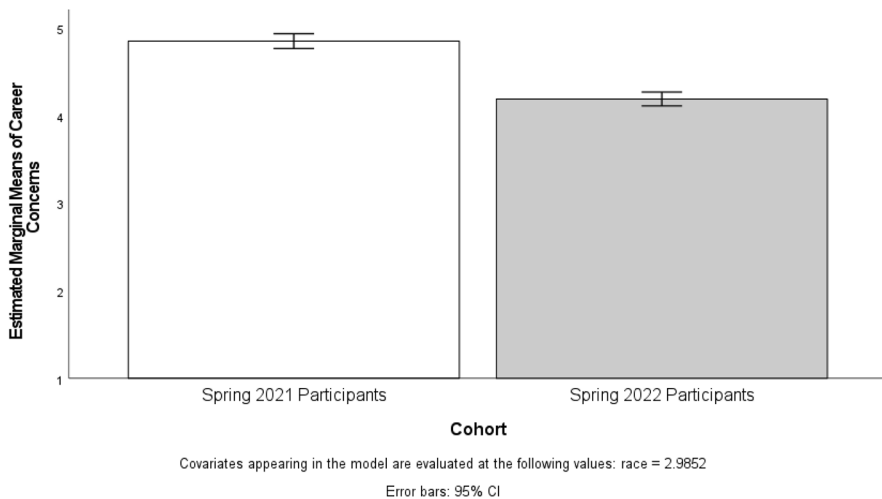


Fig. 1 Career Concerns for Different Cohorts (Spring 2021 vs. Spring 2022). (Note: Participants’ response to the survey item: “Are you concerned about job opportunities shrinking as a result of the ongoing COVID-19 pandemic?”)

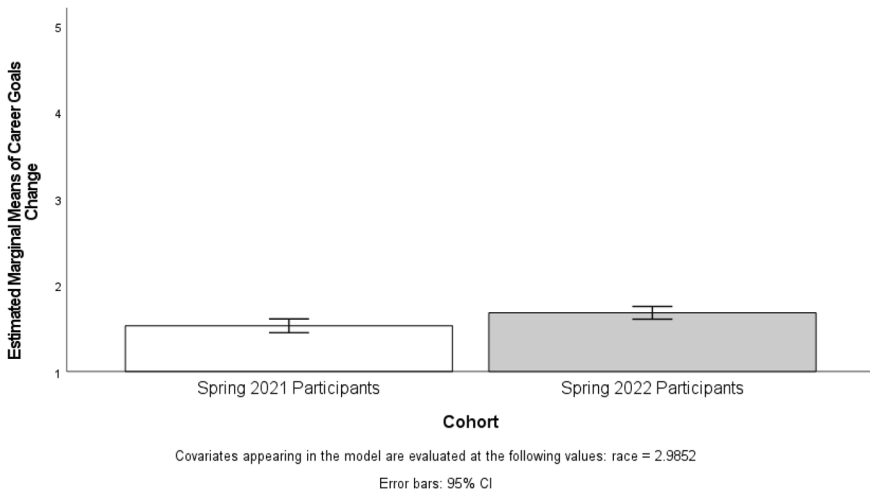


Fig. 2 Career Goals Change for Different Cohorts (Spring 2021 vs. Spring 2022). (Note: Participants' response to the survey item: As a result of the ongoing COVID-19 pandemic, have your career goals changed?)

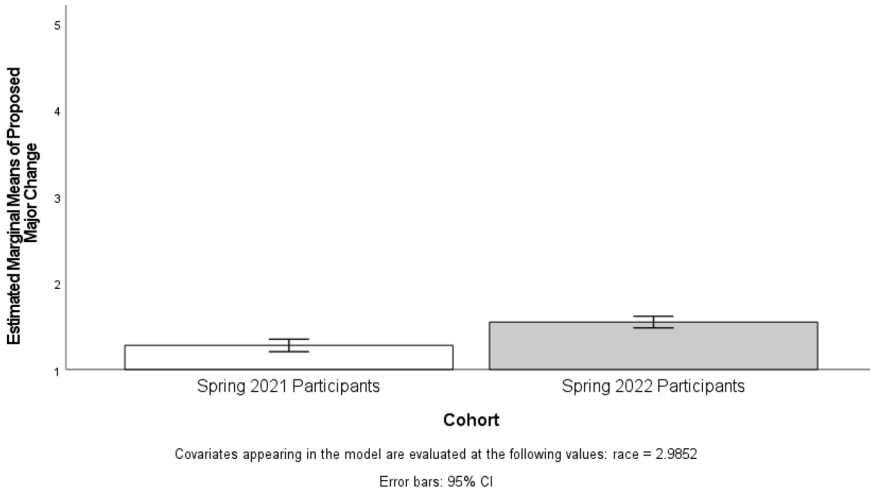


Fig. 3 Proposed Major Goals Change for Different Cohorts (Spring 2021 vs. Spring 2022). Note: Participants' response to the survey item: As a result of the ongoing COVID-19 pandemic, has your proposed major changed?

correlated with lower career opportunity concerns (supporting H1d), $R^2=0.01$, $F(1, 1362)=10.15$, $b=-0.16$, $t(1362)=-3.19$, $p<.01$ as well as lower self-reported changes in the academic goals (supporting H1a), $R^2=0.03$, $F(1, 1362)=34.86$, $b=-0.27$, $t(1362)=-5.90$, $p<.001$, career goals (supporting H1b), $R^2=0.02$, $F(1, 1362)=24.78$,

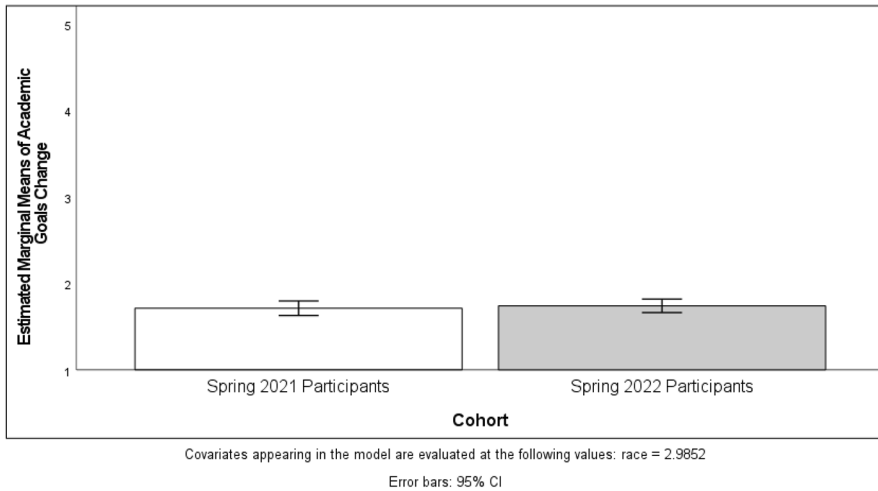


Fig. 4 Academic Goals Change for Different Cohorts (Spring 2021 vs. Spring 2022). (Note: Participants' response to the survey item: As a result of the ongoing COVID-19 pandemic, have your academic goals changed?)

$b = -0.22$, $t(1363) = -4.98$, $p < .001$, and proposed major (supporting H1c), $R^2 = 0.01$, $F(1, 1362) = 13.64$, $b = -0.15$, $t(1362) = -3.69$, $p < .001$ as a result of the pandemic.

Similarly, resilience was associated with lower career opportunity concerns (supporting H2d), $R^2 = 0.01$, $F(1, 1362) = 15.74$, $b = -0.18$, $t(1362) = -3.97$, $p < .001$ as well as less self-reported changes in the academic goals (supporting H2a), $R^2 = 0.02$, $F(1, 1362) = 30.95$, $b = -0.24$, $t(1362) = -5.56$, $p < .001$, career goals (supporting H2b), $R^2 = 0.02$, $F(1, 1362) = 21.38$, $b = -0.19$, $t(1362) = -4.62$, $p < .001$, and proposed major (supporting H2c), $R^2 = 0.02$, $F(1, 1362) = 31.48$, $b = -0.21$, $t(1362) = -5.61$, $p < .001$. Findings from both regression analyses remained consistent even when the cohort (Spring 2021 vs. Spring 2022) was controlled for.

6 Discussion

The COVID-19 pandemic has upended many aspects of daily life, including higher education. Among the many impacts of the COVID-19 pandemic is the negative and uncertain career prospects that college students anticipate (Aucejo et al., 2020; Usher et al., 2021). Findings from our study add to the emerging body of literature on the perceived impacts that the ongoing COVID-19 pandemic has on college students' academic and career plans.

Findings from the current study revealed that participants with higher levels of self-reported grit were less concerned about a decrease in career opportunities as a result of the ongoing COVID-19 pandemic and reported fewer changes to their academic and career goals as well as proposed major. In a similar vein, resilience was associated with lower career opportunities concerns and fewer academic and career changes. Our findings demonstrate that even in the midst of the global pandemic,

psychosocial factors, such as grit and resilience, can serve as protective factors (Liu et al., 2020). Although the benefits of grit and resilience in academic and professional contexts have been well-established (Duckworth et al., 2007; Galatzer-Levy et al., 2012), to our knowledge, the current study is the first to examine their academic and career impacts among undergraduate students in the midst of the ongoing COVID-19 pandemic.

Importantly, findings remained unchanged even when controlling for the cohort. This is noteworthy as significant differences were found between Spring 2021 and Spring 2022 participants' perceived academic and career impacts from the pandemic. Findings revealed that Spring 2022 participants reported lower career opportunities concerns than Spring 2021 participants. This result is as expected given that significant changes were observed between Spring 2021 and Spring 2022 in public health situations as well as in school and work environments (i.e., return to in-person classes and work, widespread availability of vaccines). Interestingly, Spring 2022 participants were more likely to report changing their career plans and proposed majors due to the pandemic. This aligns with some other survey research on first-year students entering college in September (Fall) 2021 indicating that the pandemic had influenced their choice of major (Intelligent, 2021).

However, no significant difference was found between Spring 2021 and Spring 2022 cohorts' changes in their academic goals, which may be independent of their career goals or proposed majors. For example, an individual's academic goal of earning high grades is not likely influenced by changes in their career goals or majors. Although these findings offer interesting insights into understanding the effects of the changing circumstances of the ongoing pandemic on undergraduate students' perceived academic and career impacts, it is important to note that potential cohort effects may have influenced the results.

6.1 Limitations and future directions

Unlike other studies that rely on subject pools, participants in the current research were not from one major or from a specific course (e.g., introduction to psychology), however, students were from a single U.S. institution, which limits the generalizability of the current findings. As the COVID-19 pandemic is a global event, psychosocial variables such as grit and resilience as well as perceived academic and career outcomes among first-year undergraduates in the U.S. may be different from undergraduates in other parts of the world. Examining grit and resilience among young persons in other countries and cultures as well as individuals outside of institutions of higher education are important areas of future research.

Somewhat unique to this research, we have data across two years (2021 and 2022) among two distinct cohorts of first-year students at a university in the U.S., which enabled us to compare these two groups' perceived impacts of the COVID-19 pandemic on their academic and career outcomes. The differences in the perceived academic and career impacts we observed between these two cohorts allude to the potential long-term impacts the pandemic had on undergraduate students. However, these were two distinct samples of first-year students, thus longitudinal data could be especially insightful to better understand how COVID-19 may impact students over

the years. In addition, given that our two cohorts were first-year undergraduate students, future research should investigate whether grit and resilience serve as protective factors in the context of a globally disruptive and stressful event among second, third, and fourth-year undergraduates as well as graduate students.

An important next step would be to continue to assess whether undergraduate students' academic and career plans are influenced by the ongoing pandemic. Given that certain psychosocial factors such as grit and resilience serve as protective factors during a time of uncertainty and change, universities could develop and test interventions designed to foster grit and resilience during first-year orientation. In addition, the university's career services and alumni networks may be able to use their resources to help existing or recently graduated students weather the widespread uncertainty during these times. Alumni services could continue to provide support in the form of continuing education on the benefits of fostering grit and resilience.

As the COVID-19 pandemic continues to impact our lives, it is important for future research to continue to examine its impact on students' academic and career outcomes, and develop empirically-based interventions to promote grit and resilience among students to protect against the negative impacts of the ongoing COVID-19 pandemic as well as other challenges in life.

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