

Race and the effects of Perceived Stress on Sustained Attention, Motivation and Affect during
COVID-19: Students in the Context of a Pandemic

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Abstract

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This study examined the differences in racial groups across perceived stress and perceived disruption during the COVID-19 pandemic among undergraduate and graduate students at a Northeastern Predominantly White Institution (PWI). The sample consisted of 268 students who completed a Qualtrics survey measuring perceived stress, perceived disruptions during COVID-19, symptoms of anxiety and depression, motivation approach and sustained attention in addition to demographics. Results indicated a significant difference in disruption as reported by Non-Hispanic White students with more sources of disruption than non-White and Hispanic students. When rating the extent of disruption, non-White and Hispanic students reported significantly greater levels of disruption. While there were no significant differences between racial groups in reports of perceived stress, all racial groups reported moderate levels of perceived stress, consistent with other researchers in the pandemic. Increased levels of perceived stress were correlated to higher levels of symptoms of depression and anxiety, greater difficulty sustaining attention and a stronger likelihood of using both prevention and promotion approaches. Those with lower economic circumstances reported higher levels of anxiety, greater difficulties sustaining attention, and were more likely to be motivated to not fail. Graduate students demonstrated significantly higher symptoms of anxiety than undergraduates and international students were more likely to be motivated to not fail than domestic students. These results demonstrate a need for university wide support to address student stressors.

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Chapter 1: Introduction

For the past three years, COVID-19 has had a large impact on all aspects of the world, influencing individuals' lives substantially, especially psychologically. Psychological impact clinically refers mental health, while colloquially may refer to overall wellness. COVID-19, also known as the Coronavirus, started in late 2019 in Wuhan, China. COVID-19 is an infectious disease that spreads rapidly through respiratory particles, and can be deathly, particularly for vulnerable populations (Fauci, Lane, & Redfield, 2020; *WHO Coronavirus*). Since late 2019, the virus has spread internationally, hundreds of millions of people have fallen ill, and over one million have passed within the United States as of August 2022 (*CDC Covid Data Tracker*). At various times different government systems have implemented varying degrees of quarantine requirements and stay-at-home orders, which is related to the effects felt by citizens when countries shut down public spaces, businesses, and schools, in order to limit travel, and to encourage citizens to stay home. On an individual level, citizens are trying to cope with the effects of illness and deaths among family members, neighbors, and friends, as well as the impact of changes in their daily lives. Since the start of the pandemic, the number of COVID-19 cases and deaths continue to rise, with well over 760 million cases globally, and over 102 million cases nationally as of April 2023 (*WHO coronavirus (COVID-19) dashboard*). Individuals' ability to cope is related to perceived stress, or how one appraises their own experiences of stress. All of the changes in everyday life as a result of the pandemic described above likely contribute to perceived stress. Given the ever-changing nature of the pandemic, the recording of statistics of health outcomes related to COVID-19 will be reported along with a date in time,

with the understanding that these numbers will continue to change beyond the publishing of this document.

According to disaster mental health, disasters are considered to have three primary effects: causing or threatening extensive death (Neria, Nandi, & Galea, 2008), influencing social processes (Norris et al., 2002) and impacting long term mental or physical health after the imminent danger has passed (Neria, Nandi, & Galea, 2008). The current pandemic meets all three criteria, and while it's timeline was extended beyond what we may typically think of as a disaster the effects are consistent with those implicated by disaster mental health. There has been extensive loss of life, an impact on social processes, such as virtual schooling and socially distanced interactions, and there is emerging evidence of long term physical and psychological harm. More specifically, six categories of outcomes experienced by those exposed to disasters have been identified, including specific psychological problems, nonspecific distress (stress that does not align with a specific diagnosis Norris et al., 2002), health issues, chronic life and work issues, interpersonal and social resource losses, and problems specific to children and adolescents (Norris et al., 2002). Mental health impact may be measured through symptoms of depression and anxiety, which are the two most often reported outcomes, following reports of symptoms of Post-Traumatic Stress Disorder (PTSD), all three of which make up the most frequently reported outcomes. According to the CDC, individuals typically experience a range of emotions during times of crisis including fear, anxiety, dread, hopelessness, helplessness, and denial (US Department of Health and Human Services, Centers for Disease Control and Prevention, 2019).

Disaster research further indicates that underserved communities, which have limited access to health care, experience greater effects of natural and technological disasters (Davis et al., 2010). Reports of COVID-19 outcomes according to race/ethnicity demonstrate that African

Americans, Latinos, American Indians, and Alaskan Native and Pacific Islanders have experienced higher prevalence and mortality rates compared to White Americans (Hooper, Nápoles, & Pérez-Stable, 2020). Further, research has shown that prevalence and mortality rates are particularly significant for Black and Hispanic Americans (Benitez, Courtemanche, & Yelowitz, 2020). Hooper et al. (2020) additionally suggest that causes of health disparities may be related to “social and structural determinants of health [structural racism], racism and discrimination, economic and educational disadvantages, health care access and quality, individual behavior, and biology” (p. 2466). The specific effects of the pandemic on these communities may be related to the privilege of social distancing, working from home, and the fulfillment of basic needs, advantages most often held by White individuals and those with higher socioeconomic status (SES).

According to a policy brief by the United Nations (UN), an increase in symptoms of depression and anxiety since the beginning of the pandemic have been observed across groups (COVID-19 and the Need for Action on Mental Health 2020). Studies in China have supported the findings of the UN. Immediately following the outbreak, individuals in China reported moderate to severe depression and anxiety symptoms, as well as stress (Wang et al., 2020). Another study on adults in the United States found that depression symptoms have increased three-fold when rates before and during the pandemic are compared (Ettman et al., 2020). Rates of depression broken down by race or ethnicity, have not yet received a lot of attention. With regard to anxiety, a study on college students in China showed that changes in economic supports, academic activities, and the predictable rhythms of daily life led to increased anxiety, while increased social support led to decreased levels of anxiety during the pandemic (Cao et al., 2020).

One group that has been significantly impacted by the pandemic is students, and those undergoing education at the time of the pandemic. Regardless of age or schooling level, many have been forced to complete school from home or adapt their schedules to a combination of remote and in-person learning, introducing new stressors to their lives on top of the stressor of a highly contagious virus. For example, many colleges and universities reacted to the spread of the virus by initially forcing students to leave campus and return to their homes, some in other time zones. In March of 2020 many schools were initially required to close according to government restrictions, which occurred primarily at the K-12 level, but also at the university level (*School closures during the COVID-19 pandemic*). According to a systematic review, at the K-12 level there was a need for changes in communication practices between teachers and families, increased support for educators teaching remotely, increased structures to support a technology gap, and there was evidence of learning loss similar to that which occurs over the summer between school years, an impact on student engagement and therefore mental health, including reports of trauma (Huck & Zhang, 2021). Principals reported feeling prepared to adjust during the pandemic and time management was a recurrent theme reported by students (Huck & Zhang, 2021). Within higher education, students had to reestablish contact with their universities through online learning following the initial school closures, which may have been difficult because of changes in time zones, inadequate space or technology and increased expectations for participating in family life. Students employed on campus lost their jobs, and family members who were supporting them may also have lost their jobs, further exacerbating the effects of the pandemic (Aucejo et al., 2020). As time has gone on and certain aspects of the pandemic have been managed or controlled and schools have reopened for in-person learning, students are having to reacclimate to additional stressors. These stressors may include COVID testing and

vaccination mandates, campus access requirements, and mask mandates among other concerns in order for students to continue learning and access their original learning environment.

Learning from home also impacted health as schools often provide meals and childcare for many students, particularly those in primary and secondary schools in low-income communities. Burgess and Sievertsen (2020) reviewed relevant studies to highlight the impact on students including loss of instruction, differences in parents' ability to provide support for learning in the home, fewer assessments of learning at the primary school level, and a poor job market for graduating students in higher education, which could influence careers. These impacts are likely to be felt most by those with low-income, racial and ethnic minorities, and students with disabilities. The impact on learning for students in the medical field, such as radiology and surgery, includes concerns of adapting educational opportunities to align with limits in training caused by social distancing and a shift in treatments to aid patients with Coronavirus, as well as prioritizing safety (Alvin et al., 2020; Daodu et al., 2020). While there has been research on college students, and radiology and surgery students during the Coronavirus, there has not yet been research on the impacts of COVID-19 on students in other types of graduate programs.

The purpose of this dissertation is to evaluate the impact of perceived stress related to COVID-19 on two groups of undergraduate and graduate students: White and non-White. At the outbreak of COVID-19 many schools transitioned to online instruction, and many placements, such as schools for individuals in applied programs (teachers, school psychologists, counselors, etc.), also transitioned to online instruction or closed completely. Even for individuals who continued to attend placements in person, meetings occurred in a different format because of social distancing guidelines, such as web-conference calls. Additionally, access to individuals with whom students work may have become restricted due to illness, an inability to access or an aversion to utilizing public transportation, and changes in living situations. Further, non-White

students may have experienced racism, such as regular microaggressions and discrimination in mentorship relationships (Brunnsma et al., 2017), restricted access to health care, difficulty fulfilling basic needs, unemployment and changes in socioeconomic status, and other problems which may have impacted their wellbeing during the pandemic. White and non-White students in the pandemic are experiencing ongoing changes to their daily lives, personal lives, and professional lives, yet the effects of structural racism on experiences of non-White students may exacerbate perceived stress in the context of the pandemic.

Therefore, more specifically, this dissertation will explore whether the systemic barriers which impact health, academic and mental health outcomes will have more of an impact on perceived stress experienced by non-White students in graduate and undergraduate programs at a northeastern university than White students. Outcome measures will focus on sustained attention, motivation, depression and anxiety. Given the extraordinary circumstances surrounding the current COVID-19 pandemic, these cognitive, motivational, and affective experiences of White and non-White graduate and undergraduate students have not been previously studied in the context of a pandemic, or in an integrated manner.

Chapter 2: Review of Literature

COVID-19

COVID-19 is a coronavirus related to the severe acute respiratory syndrome (SARS) virus. Previous SARS related outbreaks, which occurred in 2003 and again in 2012 (a SARS related virus called MERS) in the Americas, Europe, and Asia (Fauci, Lane, & Redfield, 2020), did not spread as widely as COVID-19 but had higher fatality rates based on the percentage of the infected persons who died (Petrosillo, Viceconte, Ergonul, Ippolito, & Petersen, 2020). In a review of Toronto's management of SARS in 2003, researchers highlighted some of the critical aspects of disaster management including education, research, communication, and morale, given the number of front-line workers who felt isolated during these outbreaks (Hawryluck, Lapinsky, & Stewart, 2005). When MERS affected South Korea, leaders learned the importance of a centralized system capable of handling national as well as regional issues, which influenced their successful handling of the COVID-19 virus. The US response to COVID-19, in comparison, has been highly decentralized, fractured, and dysfunctional (Kim, Oh, & Wang, 2020).

Since the beginning, the COVID-19 pandemic has had profound effects at varying time points across geographic locations in the United States. Initially, there were shortages of basic supplies including food (especially meat), construction materials, and Personal Protective Equipment (PPE). Shortages shifted geographically across the country as the virus spread and effects of the virus have been felt at different times in different locations; in certain geographic regions these effects have been amplified due to population density and differences in access to healthcare providers. The shift to virtual or online work has enabled many to function within their professional world completely virtually, however this has brought challenges including

internet connectivity issues and social isolation. None of these challenges appear to impact groups of people equally, rather they appear to disproportionately affect certain groups, such as the elderly, people of color and those of low socioeconomic status. For example, many parents who are working from home serve a dual role, both as parents and teacher assistants, as they try to help their children with online learning. However, those living in poverty have been impacted the most, as two in seven children are without internet access (Masonbrink & Hurley, 2020). Therefore, people without computers and poor or no internet service are likely to rely on public libraries and/or school owned laptops (Di Pietro et al., 2020). If WIFI is available in the home, family members may have to contend with each other for access. In a virtually shifted world, internet access has become a basic entry point to society.

Disaster Psychology

The field of disaster psychology focuses on the quantitative effects of disasters, such as overall severity or impact, impact by type (technological vs. natural), severity of exposure and related monetary and economic losses related to loss of work, as well as the identification of various psychopathological outcomes of disaster. The literature has identified depression and anxiety among the top three most common pathologies that develop from disasters (Norris et al., 2002). Research has indicated that the duration of a disaster in addition to the amount of unpredictability and lack of control are among the major factors influencing the outcomes of a disaster (Baum & Davidson, 1985). The unpredictability and lack of control during a disaster invokes decision-making processes to mitigate negative outcomes which involve risk-identification, risk-assessment, and finally risk-reduction (Gantt & Gantt, 2012). Response to disasters and harm mitigation depends on recognition of the level of harm and exposure, evaluation of consequences, and level of severity. Planning large-scale disaster response requires coordination and control to mitigate the effects of a disaster. Such a large-scale response may be

challenging to coordinate, as resources and individuals are required to move towards the most affected part or area of the disaster, when a natural inclination may be to move away from the affected area in a hurried and disorganized manner due to duress (Fritz & Williams, 1957). Furthermore, disasters are unplanned and therefore coordination and control that follows is reactive, rather than preventative. Harm reduction and mitigation is crucial for working towards best possible outcomes in disaster response, which is dependent upon severity and impact typically related to quantitative outcomes.

Individuals and communities regularly experience trauma and disasters in vastly different ways, depending on the location and circumstances of the disaster. Thus, research has focused on a substantial array of outcomes associated with disaster and trauma from economics to mental health. Mental health outcomes will be the focus of this paper. One professor of an applied psychology field juxtaposed her experiences with 9/11 and Covid-19 in New York City to those experienced by a researcher of applied psychology in Minnesota (Alpert & Nguyen-Feng, 2020). Alpert and Nguyen-Feng (2020) described similar emotional themes related to both events, including racism, feelings of disorientation, dislocation, and individual acts of kindness. However, Nguyen-Feng highlighted feelings of selfishness and the impact of COVID-19 on life events such as graduation and jobs, while Alpert highlighted more acute stressors and experiences of trauma. Research has demonstrated that individuals are likely to engage in pro-social behaviors during and following a crisis and engage in acts of solidarity (Gantt & Gantt, 2012; Fritz & Williams, 1957), and while Alpert and Nguyen-Feng highlighted increases of discriminatory behaviors observed during 9/11 and the pandemic, both also observed expressions of kindness and hope. Anecdotally, students of Alpert and Nguyen-Feng reported experiencing exhaustion, helplessness, and anxiety, as well as a shift in priorities from assignments to concern for family members. These researchers also described concerns their students had for those that

they serve in their applied learning placements, such as individuals in abusive environments (Alpert & Nguyen-Feng, 2020). This thematic analysis of early psychological concerns in COVID-19 provides a guide for further areas to explore and identify patterns across disasters.

Disasters have myriad direct and indirect effects on the communities where they happen, as well as indirect effects on other communities nationally. The tragedy of 9/11 was measured economically through loss of life, workers' wages, and costs of repairing damage, with an overall impact of billions of dollars throughout the economy (Bram, Orr, & Rapaport, 2002). These effects were primarily felt locally, in New York and the other areas of the attacks, yet there was evidence of a larger effect on the national business cycle. Furthermore, the effects of a disaster are not limited to physical or economic effects. Gibbs and Montagnino (2016) identify SES, available resources, previous level of psychopathology, age, social and family factors, gender and ethnicity as primary factors that contribute to varied levels of vulnerability. This dissertation will focus on the experience of undergraduate and graduate students' vulnerabilities by ethnicity or race, measured by self-report.

Racial Disparities Pre- and During COVID-19

Racial and ethnic health disparities have been widely researched and there are various theories on the causes of these disparities within public health. It is important to define race given that race is a social construct. For the context of this dissertation, race can be understood as a mechanism used to differentiate White people from people of color (*Racism Defined*). Over time, research in the field of public health has identified multiple models explaining the causes of racial and ethnic health disparities: "a racial-genetic model, a health-behavior model, a socioeconomic model, a psychosocial stress model, and a structural-constructivist model" (Dressler, Oths, & Gravlee, 2005). Much of the research behind these models draws upon physical health outcomes such as high blood pressure and low birthweight, and race has often

been used as a predictor of health outcomes in the mental health literature (Travassos, & Williams, 2004). This dissertation seeks to expand research on the mental health disparities related to race, particularly during a disaster.

Historically, there have been racial and ethnic disparities in the wake of natural disasters such as Hurricane Katrina, the Spanish Flu in 1918 and the H1N1 flu. Outcomes of Hurricane Katrina found death rates of African Americans to be 2.5 times greater than that of Whites when stratified by age; though equivalent death rates were evident across racial groups when all ages were combined (Purtle, 2012). During Katrina, disaster communication was provided solely in English, which created increased disaster exposure for non-English speakers, as non-English speakers were unable to prepare adequately for the disaster, and therefore increased disparities. Similarly, cultural decisions related to religious beliefs and feelings of optimism lessened the concern for the effects of natural disasters on various cultural groups. For example, distrust of police within the African American community led to lower levels of evacuation in these communities, again contributing to increased disparities. Following Hurricane Katrina, African Americans when compared to other races, also experienced a greater severity of symptoms of Acute Stress Disorder (Purtle, 2012), which individuals may experience immediately following a disaster (5th ed.; DSM-5; American Psychiatric Association, 2013). It is possible that symptoms of Acute Stress Disorder may be related to ongoing perceived stress at the time of a disaster. During the Spanish flu, the mortality rate for American Indians was four times the rate of any other racial or ethnic group. Similarly, during the H1N1 flu, American Indians and Alaskan Natives experienced a rate four times that of all other racial groups (Purtle, 2012). Further, Hispanics and African Americans were hospitalized at rates double that of non-Hispanic Whites during the H1N1 flu. Historically, racial disparities are evident both in communication and reactions to disaster, as well as psychological and health outcomes.

Much of the research in health disparities in the US outside of disasters has focused on inequalities between White and Black Americans, which are often attributed to structural racism or the ways that society creates and perpetuates disparities (Hanks, Solomon, & Weller, 2018). Racial disparities are a ubiquitous feature of the U.S. economic, cultural, and social landscape. For example, rates of unemployment in Black communities have consistently been twice that of White communities for the past 50 years (Emeka, 2017). Even in times of stability, or the absence of disaster, disparities between White Americans and Black Americans exist. Data from the US Bureau of Labor Statistics in 2019 demonstrate that unemployment rates fell to 3.0 percent for Whites, 5.4 percent for Black Americans and 4.0 percent for Hispanic or Latinx individuals (“Unemployment Rates by Age, Sex, Race,” 2021). Further, data has shown that the wealth of Black Americans has hovered around one-tenth of that of White Americans, from 1989 through 2016 (Hanks, Solomon, & Weller, 2018). The ongoing wealth gap between Black Americans and White Americans is largely due to systemic racism, including discriminatory practices in the housing (redlining) and labor markets (Hanks, Solomon, & Weller, 2018). Additionally, U.S. poverty rates are highest for Native Americans, followed by Black and Hispanic Americans (“The Population of Poverty USA”). However, in urban areas, such as New York City, rates of poverty vary across racial groups. For example, in New York City from 2010 through 2014, Asian Americans had the highest rates of poverty, reaching a peak at 26.6% in 2014 (Krampner et al., 2017). When it comes to health, research has shown that Black American infants die at much higher rates than White infants especially in certain parts of the U.S., and that Black Americans experience higher rates of lung cancer and cardiovascular disease than White Americans (Satcher & Higginbotham, 2008). Dressler, Oths, and Gravlee’s (2005) review of the literature on racial and ethnic health disparities found support for Satcher and Higginbotham’s findings, and in addition, highlighted higher rates of blood pressure and hypertension in Black

Americans. Chen et al. (2006) found that children's health outcomes were impacted both by SES and race for Black and White children to a similar degree and that these factors are best considered in tandem rather than individually as patterns across groups vary. However, in the context of Chen's work, Hispanic and Asian children were found to be protected by cultural and lifestyle choices, such as valuing collectivism and close interpersonal networks, which positively impacted health outcomes. Research over time has shown that low SES is correlated with negative health outcomes in children and adolescents. For example, chronic illnesses are more likely for lower SES individuals and in adults, low SES is related to increased morbidity and mortality rates of conditions such as asthma and cancer (Hanson & Chen, 2007). Prior to the COVID-19 pandemic disparities have existed between racial groups, particularly those of Black and White Americans, as demonstrated by significant wealth and health differences.

The effects of these racial disparities have been felt across life outcomes during the COVID-19 pandemic. COVID-19 infection and death rates, while increasing across racial groups, have been shown to be greater in neighborhoods with higher proportions of Black Americans (Li et al., 2020). *The Atlantic* created "The COVID Tracking Project" (2020), led by volunteers in efforts to collect and distribute data about COVID-19 in the US, which supports this data and demonstrates that Black Americans have died at a rate of 1.5 times that of White Americans. A study by Moen and Flood (2020) looked at employment outcomes across race, gender, age, and education for the first four months of 2020, and found that individuals of all races experienced increased levels of unemployment. However, when looking at the breakdown of unemployment by race and other variables, Moen and Flood (2020) found that unemployment affected Black women in their 20s more than other racial and age groups, though when considering age groups without factoring in race, individuals in their 20s were most at risk of unemployment. When stratifying by education level, college educated Black, Hispanic, and

Asian men experienced greater rates of unemployment than their White counterparts (Moen & Flood, 2020). It is likely that the higher rates of unemployment for non-White Americans also leads to an increasing wealth gap between these populations.

Racial disparities in employment may be particularly experienced by essential workers during the COVID-19 pandemic. Essential workers during the pandemic include those in healthcare, such as respiratory therapists and nurses, medical assistants, as well as food system employees such as those in the animal slaughtering and processing industry, grocery store workers, and farmers. In addition, there are other groups that are in frequent contact with others, such as bus drivers and flight attendants, that also have heightened risks of infection. Research on which occupations qualify as protected or essential workers during the pandemic is still evolving and has varied state by state (Hawkins, 2020). Migrant workers as well as non-Hispanic Black Americans have been overrepresented in these occupations as compared to non-Hispanic Whites during the pandemic (Reid, Ronda, Perez, & Schenker, 2020; Rogers et al., 2020). While those in healthcare have inherently higher levels of exposure to COVID-19, those working in food production, such as migrant farm workers, may have higher levels of exposure in their travel and accommodations, as they travel to work together and live in crowded homes (Reid, Ronda-Perez, & Schenker, 2020). Those working at meat processing plants, many of whom are also migrant workers, have high rates of infection due to working conditions that enable the virus to thrive, including close proximity of workers, metallic surfaces and workers raising their voices to communicate with each other over the sound of machines (Middleton et al., 2020). Cold temperatures were also initially believed to enable the virus to thrive, yet over time it has become evident that cold temperatures drive people indoors where the virus is more likely to be transmitted (Ordway, 2022). Data from April 2020 demonstrated that 3% of meat processing workers contracted COVID-19. Many of these individuals may have felt pressured to work

despite feeling ill, potentially increasing transmission of the virus (Dyal et al., 2020). The highest percentages of COVID-19 deaths for non-White racial and ethnic groups had correlations above .87 within the following occupations: protective services (i.e., firefighters, police officers, and security guards), healthcare support, transportation and material moving, office and administrative support (Rogers et al., 2020). Food preparation fell within the top six highest correlations of percentage of COVID-19 deaths by occupation for non-White racial and ethnic groups with a correlation of .84 (Rogers et al., 2020). For Black Americans infection and death rates may be related to the fact that Black individuals in the workforce make up a greater proportion of jobs deemed essential services and therefore have not been able to work from home during the pandemic (Li et al., 2020), in addition to disparities in healthcare.

Employment, wealth, and health are not the only areas where racial disparities and issues of access are evident. In education, access to technology including the internet and access to transportation to libraries to use computers has been deemed the “digital divide” (Gorski, 2005). The digital divide has existed in education since the 1990s, and research has continually shown disproportional access to information and communication technology across SES and race (Ritzhaupt, Liu, Dawson, & Barron, 2013). Research in Florida, a large state with a diverse population, has shown that minority students are less literate regarding information and communication technologies, and have less access to computers with internet access (Ritzhaupt, Liu, Dawson, & Barron, 2013). Therefore, the pandemic created concerns around technology and internet access amid other stressors for all individuals, but particularly for those who are non-White. In 2018, research showed that American Indian/Alaskan Native, Black, and Hispanic students had the highest rates of no internet access or only dial-up access, with inaccessibility and dial up rates of 27%, 19% and 17%, respectively. In student groups, the lowest inaccessibility and dial-up rates were found among: Pacific Islander (12%), two or more races

(7%), White (7%), and Asian (3%) students (Cookson, Darling-Hammond, & Edgerton, 2020). During the pandemic, according to teacher reports, the enrollment of students of color was inversely related to internet access at home (Stelitano et al., 2020). Teachers at schools with students who have greater rates of internet access at home also perceived greater rates of communication between schools and families as well as assignment completion (Stelitano et al., 2020). Geographic location is often an indicator of inequality as location directly relates to access to resources such as safe drinking water, energy sources, healthcare, and education, among other factors (Deichmann, 1999). The intersection of geographic location, (i.e., urban, suburban, or rural,) or SES and race/ethnicity is evidenced by data showing that children of low SES have poorer health than children of high SES, and that non-White children have poorer health than White children (Chen, Martin, & Matthews, 2006). Yet, it is important to examine racial groups and levels of SES in tandem to understand the cultural impact on outcomes of various health conditions in different racial groups (Chen, Martin, & Matthews, 2006). While research on the digital divide focuses on K-12 students, during COVID-19 all students from primary through higher education have adapted to virtual schooling and grappled with internet access. During COVID, the digital divide has exacerbated any pre-existing racial disparities within the student population.

Impact of COVID-19 Trauma on Education

COVID-19 has led to incredible changes to the delivery and consumption of education. Educators reacted to the inability to provide in-person instruction and made decisions that have impacted their courses, without explicitly considering their medium- and long-term effects. Educators had to consider instructional delivery via the internet, alterations to assignments and timelines of assignments, and benefits from social interactions in adapting and designing online instruction (Scott, 2020). Additionally, prior to the pandemic, many students and parents,

particularly those in primary and secondary schools, relied on schools for food, childcare, support, and basic health care (Buechner, 2021), which they no longer had access to when schools went online.

Much of the discussion of the impact of COVID-19 on education earlier in the pandemic was anecdotal. There are few empirical studies because the pandemic and its effects are ongoing. Regardless, the media regularly discusses “loss of learning” that is occurring due to the shift in learning from school to virtual, however the effects of potential loss of learning will become more evident as time progresses and is challenging to quantify in the moment. A systematic review, of K-12 schooling reported evidence of learning loss similar to that which occurs over the summer between school years (Huck & Zhang, 2021).

Without quantitative evidence of loss of learning, it can be understood that educational access may be impacted by challenges with internet access as outlined above, particularly for low-income families that do not own computers or have internet connections, ultimately preventing their students from attending school or accessing school content outside of school hours, among other factors. Increased levels of absenteeism have been shown to influence reading levels and other educational outcomes (Haseltine, 2021). Data from Utah demonstrated that kindergarteners had a decrease of 14% in literacy progress and third graders a decrease of over 5% in literacy progress during the pandemic, the highest rate amongst elementary school children from the previous year (Jones & Pflaum, 2021). Additionally, it appears that low-income students, in large, urban school districts like the Chicago public schools, have high rates of absenteeism that is pandemic related (An, 2021). More specifically, African American, Hispanic, and American Indian and Alaskan Native low-income students experience the highest rates of absenteeism and the greatest negative effects of COVID-19 on their education (Haseltine, 2021).

Administrators and policy makers have begun to think about and examine returning to conventional in-person schooling and what the impact of the pandemic trauma will mean for students. The unpredictable nature of COVID-19 and the trauma caused by it has emphasized the importance for educators to address not only academic concerns, but also social-emotional and physical concerns from a trauma-informed perspective (Darling-Hammond, & Hyler, 2020; Berry 2020). The pandemic has exposed all children to greater than normal levels of stress and trauma, which has been magnified for students of color who bear the brunt of the effects of racial discrimination and poverty (Darling-Hammond & Schachner, 2020). Further, a pre-pandemic meta-analysis demonstrated that social-emotional learning can help to minimize effects of stress while also improving skills, behaviors, and academic performance (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011). This whole-child or holistic view of students is necessary not only at the K-12 level, but also for higher education.

Students' experiences in Virtual/Online Learning

Schooling encompasses the learner and the learning environment; therefore, it is important to consider the pressures on students caused by the pandemic and the unexpected need to shift to online learning. Effective learning has been understood through four corresponding lenses: learner centered, knowledge centered, assessment centered, and community centered (Bransford, Brown, & Cocking, 1999). These lenses can be identified in classroom learning by considering students' needs, content, learning assessment, and the ability to create a sense of community via in-person interaction. Because of the pandemic, the initial shift to online learning was ubiquitous from primary school through higher education. The shift dramatically changed how and to what extent educators can identify the needs of students, deliver content, assess what is learned and assess the impact of the loss of a classroom community on children's education.

Changes have included options for synchronous or asynchronous learning, class participation via online postings rather than active speaking participation in class, and the potential for adjustments to curriculum and the care students receive, including how schools and leaders meet basic needs and foster a sense of connection. However, the effectiveness of the aforementioned adjustments and differential implementation of may contribute to a diminished learning experience and reductions in students' mental health during stressful times (Hickling et al., 2021).

Much of the research on distance learning compared to in-person learning has focused on barriers to learning, both for faculty and students, that present affective and cognitive challenges. Examples include reduced motivation, decrease of faculty support, feelings of isolation and inexperience with the mode of learning (Galusha, 1998). Before the pandemic, O'Regan (2019) identified both positive and negative emotions students associated with online learning including frustration, fear, anxiety, apprehension, shame/embarrassment, enthusiasm/excitement, and pride. Therefore, stressors associated with online learning during the pandemic may contribute to heightened levels of anxiety and depression, as feelings of fear and anxiety are exacerbated and isolation is prevalent, particularly as they relate to perceived stress and motivation to learn. The result may be less metacognitive regulation and hypervigilance, which can detract from cognitive processing (Hascher, 2010). The overall prevalence of anxiety and depression in graduate students tends to be at similar levels in non-pandemic times, and therefore is a relevant pervasive concern.

As noted above, many students and individuals have reported increased levels of fear, anxiety, and sadness throughout the COVID-19 pandemic (Rodríguez-Hidalgo et al., 2020; Tang et al., 2020; Ettman et al., 2020). Additional stressors include those related to relationships and academic life, isolation, fear of contagion, and global stress (Zurlo et al., 2020). These stressors

may be heightened for some students, particularly for Black, Indigenous and People of Color (BIPOC) students, due to the resurgence in the Black Lives Matter movement a few months after the start of the pandemic, in response to the widely publicized murders of a several Black Americans early in the pandemic.

Not only are affect and emotion large parts of the learning experience, so is motivation. Research on motivation within the context of online learning has often used self-determination theory as a framework, which posits that learners work to fulfill three basic needs: autonomy, competence, and relatedness (Chen & Jang, 2010). How students are related to others, as exemplified by the idea of belongingness, may play a part in a feedback loop of self-regulation. In the academic context, feelings of relatedness to a teacher have been demonstrated to have a positive relationship with intrinsic motivation values, such as class engagement and academic outcomes (Kaufman & Dodge, 2008). Therefore, this feedback loop may determine a greater range of affect experienced while learning, underlining the connectedness of affect and emotion in learning. For example, students that feel connected to their peers or teachers may be more motivated to demonstrate their ability to complete tasks on their own and their knowledge of content, which leads to positive academic outcomes. It is possible that the stress associated with the pandemic has impacted motivation negatively. For example, during the pandemic individuals have become stressed about and preoccupied with their own health, which diverts cognitive energy away from academic goals. Individuals may also have to take care of loved ones and family members, which becomes a priority above and beyond personal academic expectations. The impact of motivation on students during the pandemic will be addressed in greater detail.

Higher Education Student Stressors

Graduate work is challenging enough without the catastrophic effects of a pandemic or existing trauma. In the best of times students are expected to complete academic courses

involving critical thinking, and high levels of engagement, as well as theses, dissertations, or other culminating projects. A pre-pandemic survey of both master's and doctoral students from 234 different institutions using the General Anxiety Disorder-7 (GAD-7, Spitzer et al., 2006) and Patient Health Questionnaire-9 (PHQ-9, Kroenke & Spitzer, 2002), demonstrated that 41% reported moderate to severe levels of symptoms of anxiety and 39% of students reported moderate to severe levels of symptoms of depression (Evans et al., 2018). For students experiencing food insecurity, the effects of depression and anxiety may be compounded, as researchers found a significant increase in levels of depression, anxiety and stress reported by those with very low food security when compared with those with low or high food security (Coffino et al., 2020). The weightiness of these experiences' pre-pandemic demonstrates the necessity for further research in this area during the pandemic. This dissertation will focus on the impact of the pandemic at the graduate and undergraduate student level. Research surrounding the well-being of graduate students has focused on general graduate populations and does not differentiate between graduate school populations by race or ethnicity. Therefore, the experiences of White and non-White undergraduate and graduate students during the pandemic will be juxtaposed.

The pandemic has brought further stress to the academic lives of students in higher education. During the pandemic, many students have lost or have reduced access to resources such as libraries, printers, and study space, as well as diminished opportunities for interpersonal interactions with faculty and classmates that enhance informal learning. For example, both undergraduate and postgraduate students in Pakistan reported significant barriers toward participating in online learning spaces during COVID-19 due to insufficient or inconsistent internet connection, in addition to concerns about the quality of their online learning experiences as a result of changes in the quality and frequency of contacts and interactions with faculty

(Adnan & Anwar, 2020). In general, students in higher education across the world experienced limited campus activities or were only able to engage in those that were shifted to an online space. Many students in applied programs lost access to their placements which may have included direct interactions with clients, students or patients and learning opportunities with professionals in their field. The shift to virtual learning deeply impacted the quality and quantity of learning opportunities for students.

Rationale for the Outcome Measures

During crises, individuals often experience helplessness, uncertainty, and isolation. Not surprisingly, depression and anxiety are among the top three pathologies following a disaster (Norris et al., 2002). Therefore, this dissertation will explore the impact of perceived stress and COVID disruptors and support on depression and anxiety in undergraduate and graduate students during the pandemic, among other outcomes.

Depression

Depression encompasses various characteristics such as change in mood or low mood and sadness, unfavorable self-concept, and other changes in behavior (Beck & Alford, 2009). According to the DSM-5, prevalence of clinical depression in the general population is about 7%, while the prevalence within the 18-29 age range is three times higher than that of those aged 60 and above (American Psychiatric Association, 2013). When stratifying depression rates by race, Hispanics have the highest prevalence, followed by African Americans and then Whites (Dunlop, Song, Lyons, Manheim, & Chang, 2003). Further, higher rates of depression are also associated with health concerns such as chronic disease and functional limitations, as well as lower economic resources, such as educational attainment and wealth (Dunlop et al., 2003).

Depression impacts daily functioning and is thus a useful measure for this dissertation to explore related to stress.

There is evidence that depression increased during the pandemic. Ettman et al. (2020) used a nationally representative sample of U.S. adults to compare rates of depression during and before the pandemic, across all severity levels (mild, moderate, moderately severe, severe) using the Patient Health Questionnaire-9 (PHQ-9). They found that overall prevalence levels of depression were three times higher during the pandemic than before it, changing from 8.5% to 27.8%. Those at lower income levels and low household savings were at greater risk for depression (Ettman et al., 2020). These researchers found that those with a household income lower than \$19,999 were 2.4 times more likely to develop depression symptoms as compared with a household income of higher than \$75,000. Further, those with household savings of \$5,000 or less were 1.5 times more likely to develop depression symptoms (Ettman et al., 2020). Depression rates during the pandemic have been shown to be related to income and savings.

Depression will be measured using the PHQ-9, which is designed to screen for common symptoms of depression to determine a level of risk for depression severity. This broadly used tool will provide a clear understanding of rates of those students at risk for depression.

Anxiety

Anxiety is defined as uncontrollable worry which impairs one's functioning and behavior (American Psychiatric Association, 2013). Clinical levels of generalized anxiety in the general adult population falls at 2.9%, with much higher rates in women as compared to men (American Psychiatric Association, 2013). Data has shown that White Americans exhibit the highest rates of anxiety disorders when compared to African, Hispanic and Asian Americans, while African Americans are more likely to be diagnosed with PTSD than other racial groups and Asian Americans are least likely to be diagnosed with any specific type of anxiety disorder (Asnaani,

Richey, Dimaite, Hinton, & Hofmann, 2010). It is possible that cultural differences, provider perception of various racial groups, including their cultural competence, and stigma surrounding mental health may lead to these differences in diagnosis of anxiety disorders. Anxiety is oftentimes related to distress surrounding life circumstances, and therefore is relevant to understanding impacts of COVID and perceived stress.

During COVID-19, research has begun to measure the rates of anxiety in various populations. According to a study in China of undergraduate medical college students during the initial outbreak of the pandemic, a total of 24.9% of students surveyed experienced symptoms of anxiety measured by the General Anxiety Disorder-7 (GAD-7), that were broken down into severe (0.9%), moderate (2.7%) and mild (21.3%) symptoms (Cao et al., 2020). While it is impossible to identify the sources of anxiety in Cao et al.'s (2020) study, they highlighted factors that were inversely related to anxiety symptoms including living in an urban area, possessing family income stability, and living with parents. Knowing family members or friends infected with COVID-19 was positively related to anxiety symptoms. When looking directly at academic effects, concern for delays of academic progress and impact on daily life was positively correlated with anxiety symptoms, while social support was negatively related to anxiety symptoms (Cao et al., 2020).

In this research, anxiety will be measured using the GAD-7, which is designed to screen for common symptoms of anxiety in order to determine a level of risk for anxiety severity.

Depression and Anxiety in Graduate Students. Much research has considered anxiety and depression in tandem. Prior to the pandemic, Evans et al. (2018) completed a study on doctoral and masters students. They found 41% of students reported moderate to severe levels of anxiety and 39% of students reported moderate to severe levels of depression, compared to a 6% rate of both depression and anxiety in the general population. Another study found that students

reported anxiety/depression within the top three health concerns negatively impacting their academic outcomes (Kernan, Bogart, & Wheat, 2011). Therefore, not only do students experience levels of anxiety and depression at higher rates than the general public, but students also report that these issues impact their performance academically. Hoying et al. (2020) studied the prevalence of anxiety and depression among first year students in applied health sciences professions, which included dental, medical, nursing, optometry, pharmacy, social work, and veterinary programs. They found that 17% of students reported symptoms of depression and 14% of students reported symptoms of anxiety, prior to COVID-19 (Hoying et al., 2020).

Interrelatedness of Anxiety and Depression, and Anxiety, Depression and Loneliness

Oftentimes individuals diagnosed with anxiety are also diagnosed with depression and they may cycle between the two, as overthinking from anxiety may impact negative thoughts related to depression, and so on. Research has demonstrated connections between the two constructs, with a cycling of patterns in observable symptoms, with an overlap of 25-40% (Dobson, 1985). Results from the US Census Bureau's Household Pulse Survey indicated increasing rates of anxiety and depression over the first few months of the pandemic (Cai et al., 2021). Relatedly, at the outset of the pandemic in the UK, researchers found that pre-existing mental health conditions, including clinical levels of depression and anxiety, were associated with higher levels of loneliness (Groarke et al., 2020). Groarke et al. (2020) found that ratings of depression were a risk factor for loneliness during COVID-19, while other researchers found the opposite, that loneliness was a risk factor for depression (Killgore et al., 2020; Jia et al., 2020). Loneliness was also shown to lead to increased reports of depression symptoms, and evidence demonstrated that overall depression rates surpassed existing depression population rates during the pandemic (Killgore et al., 2020; Jia et al., 2020). One study conducted at the beginning of COVID-19 found that those quarantined due to the virus reported higher levels of anxiety and

depression compared to those that were not quarantined, with overall high levels of reports of symptoms of anxiety and depression (Tang et al., 2020).

Perceived Stress

Perceived stress is not a clinical or diagnostic condition, rather it is a way to quantify everyday stress or extraordinary stress, which may not fit with a syndrome. Perceived stress is highly related to depression and trauma related diagnoses, as demonstrated by a high correlation between depression symptomatology and perceived stress (Cohen et al., 1983). Campus connectedness was found to moderate the relationship between perceived stress and depression for undergraduate students (Pidgeon et al., 2014). Furthermore, perceived stress and symptoms of PTSD predicted cognitive failures, such as forgetting tasks or items (Boals & Banks, 2012).

Perceived stress is often used to measure non-clinical levels of stress in populations during and after various disasters. After Hurricane Sandy, which affected the New York area in 2012, researchers measured perceived stress in residents of affected counties. They found that exposure to the hurricane led to significant levels of perceived stress (Schwartz et al., 2016). Schwartz et al. (2016) also found that demographics including Hispanic ethnicity and a history of mental health difficulties, among others, were associated with increased levels of perceived stress.

During the COVID-19 pandemic, researchers in France measured perceived stress using a visual analog scale (VAS) to understand the passing of time under lockdown. Results indicated an inverse relationship between perceived stress and passage of time; as perceived stress increased, time was perceived to slow down. They also found a positive correlation between perceived stress and anxiety (Droit-Volet et al., 2020). Another study attempted to encapsulate the levels of perceived stress in 57 countries during the pandemic. Results found a mean score of 19.08 or moderate level of stress (Adamson et al., 2020).

Perceived stress will be measured using the Perceived Stress Scale, developed to gauge perception of lack of control and predictability in one's life (Golden-Kreutz et al., 2005).

Depression, Anxiety and Perceived Stress

Fawaz and Samaha (2020) focused on depression, anxiety and stress outcomes in Lebanese college students using the Depression, Anxiety and Stress Scale-21 (DASS-21) while under quarantine during COVID. Students reported relatively low amounts of stress with 1.7% of respondents reporting moderate symptoms and 11% reporting mild symptoms. For depression, 1.7% experienced severe, 13.8% moderate, and 17.9% mild symptoms. Symptom severity was highest for anxiety with 2.3% reporting extremely severe, 6.3% severe, 21.9% moderate and 13.3% mild symptoms. These researchers also found a significant negative relationship between online learning satisfaction across all outcome variables, indicating high levels of dissatisfaction, particularly with technological concerns, though this did not appear to impact experiences of symptoms of depression, anxiety and stress as reports remained low (Fawaz & Samaha, 2020). While the majority of students were not reporting clinically significant levels of distress or symptoms of depression, anxiety and/or stress, a significant portion of students were experiencing symptoms, necessitating further exploration of risk and protective factors, as well as potential mediating factors.

Another study conducted using the Depression, Anxiety and Stress Scale-21 (DASS-21) on the general population in China found similar results, with the lowest percentage of respondents rating moderate to severe levels of stress (8.1%), and the greatest percentage of respondents rating moderate to severe levels of anxiety (28.8%). That said, respondents rated the overall psychological impact of the pandemic at 53.8%, which would represent severe levels of psychological impact if using the same severity cutoffs used for measuring stress and anxiety (Wang et al., 2020). In Ecuador, results of the DASS-21 indicated high levels of stress, anxiety

and depression for undergraduate students compared to undergraduates outside of a pandemic experience (Rodríguez-Hidalgo et al., 2020). These researchers created a model that found that anxiety mediated the positive relationship between COVID-19 stress and levels of depression (Rodríguez-Hidalgo et al., 2020). A study in the US using the PHQ-9 and GAD-7 to measure depression and anxiety in young adults aged 18-30, demonstrated that COVID-19 specific worry, loneliness and low distress tolerance was positively related to clinical levels of depression and anxiety, with 43.3% of participants reporting depression and 45.4% reporting anxiety (Liu et al., 2020). When considering race/ethnicity, non-White respondents were less likely to report symptoms of mental health (Liu et al., 2020). These rates are higher than those reported in both Lebanon and China.

Motivation

Motivation in the context of learning often relies on cognitive processes such as metacognition and self-regulation. Among many existing motivational theories and approaches within this framework is Higgins' (1998) research on the self-regulation of pleasure and pain, which he calls regulatory focus. Regulatory focus concentrates on the processes of promotion and prevention. Promotion deals with the ideal self, or self-regulation as it relates to one's goals, ambitions, and desires, particularly as it relates to growth and development of needs (Lieberman, Idson, Camacho, & Higgins, 1999; Higgins, 1998). Prevention deals with the ought self, which involves self-regulation in response to obligations and responsibilities, from a need to establish a sense of security or safety (Lieberman, Idson, Camacho, & Higgins, 1999). The university environment lends itself easily to Higgins' motivational approaches, as most individuals engaged in university study have or pursue goals by virtue of being university students. Higgins (1998) acknowledges that each motivational approach may elicit different emotions. At the university level, individuals' behaviors and goals may be in conflict with one another. Higgins' Self-

Discrepancy Theory (1987) posits that individuals attempt to match their self-concept with their ideal or ought self, whichever is most salient to them and guides or motivates them to perform. Researchers agree that when self-concept beliefs are conflicting this elicits feelings of discomfort. However, Higgins (1987) found that when there is a conflict between self-concept and the ideal self, individuals are more likely to experience dissatisfaction and sadness, characterized as dejection related emotions, while when there is a conflict between self-concept and the ought self, individuals are more likely to experience fear and restlessness, or agitation related emotions. These elicited emotions are particularly relevant as research on anxiety and depression during the pandemic have indicated increased levels of sadness and fear, which are likely also impacted by motivation.

Self-discrepancy theory and motivation are correlated with anxiety and depression. Higgins (1987) found that the discrepancy between actual behaviors and the ideal self-correlate with high depression symptoms while the discrepancy between actual behaviors and the ought self-correlate with high anxiety symptoms. When considering the ideal self and the ought self, the ideal self may be closely related to self-concept and self-worth, leading to feelings of dejectedness, related to symptoms of depression. In contrast, the ought self may be disposed towards another person's views, rather than their own, which may be related to feelings of irritation and symptoms of anxiety. During the pandemic priorities and goals have shifted for various individuals which may be related to feelings of depression or anxiety, including those related to training goals and academic experiences. Uncontrollable worry as it relates to anxiety may lead individuals to be more motivated by external variables they must achieve in order to establish safety, and they may be more likely to defer their own personal goals at the expense of others. Alternatively, those who experience negative thoughts sadness and dejection, which may negatively impact their self-concept, could lead to increased levels of depressive symptoms.

Beyond emotional concerns, Higgins has found that promotion and prevention can impact decision-making on rote tasks such that those with a promotion focus attempt to limit errors of omission, while those with a prevention focus attempt to limit errors of commission (Crowe & Higgins, 1997). When applied to the general academic context, a promotion approach typically applies to those students that are interested in learning the content of a course or specific content and developing mastery of the content, while prevention applies to those students that are working to avoid failure. However, students' experiences with COVID-19 such as their sense of belongingness and ability to engage with schoolwork may change because of the switch from in-person to online instruction and personal interactions, and therefore cause a shift in their educational and life priorities which may cause a shift in their motivational approach and ability to sustain attention. Also, students that are under resourced or systemically disadvantaged, may be more likely than others to shift their motivational approach, due to exacerbated stressors and demands.

Attention

Sustained attention involves executive functioning, or the cognitive skills to plan and execute tasks, which may relate to specific goals. Research in the realm of academic skills has demonstrated that handwriting speed, sustained attention, and verbal ability can greatly influence academic performance (Peeverly & Wolf, 2019). In the current pandemic, students may have adapted certain academic skills such as notetaking and approaches to learning due to the shift to online learning and a shift in classroom assignments and assessments. Relatedly, students' priorities may have shifted due to demands of the pandemic, such as caring for ill or at-risk family members. As a result of this, it is posited that the ability to sustain attention may have shifted as well, as increased visual and virtual demands may lead to increased difficulties sustaining attention. In addition, the shift in demands of life such as changes in living

arrangements, differing time zones while attending school, and other life circumstances may further impact abilities to sustain attention. Further, the shift in priorities to one's own health, the health of loved ones and ensuring that basic family needs are met, may also lead to decreased sustained attention as other priorities take precedence of those of an academic nature.

The central construct of limited capacity processing, which implies that human brains are limited and devote attention towards specific tasks at the expense of others, is most often demonstrated in research on reading and driving (Kahneman, 1973). However, the effects may be evident in other cognitive tasks and affect as well, as stressful environments impact the ability to use the available limited capacity for academic and personal functioning. Some research has demonstrated that high demand on cognitive resources posed by positive and negatively valenced information has varying effects on the encoding and storage of information (Yegiyan, 2015). For example, advertisements quickly activate cognitive processing systems, according to the emotion of the presented information, either pushing the system to its limit or allowing for residual space (Yegiyan, 2015). During COVID-19, sensory information has increased incredibly due to the consumption of news and information related to the pandemic on a continuous and ever-changing basis, as well as the increased engagement with others via screens and virtually, as compared to direct, in person contact. Therefore, it is likely that the stressful nature of this information and altered mode of communicating is impacting encoding and storage of information for all individuals.

Attentional control is the ability to choose what to pay attention to. Attentional Control Theory posits that anxiety impacts attentional control and more specifically, the efficiency of this process in working memory (Derakshan & Eysenck, 2009). As discussed above, anxiety is a prominent experience of those experiencing a crisis, and therefore it is likely that individuals' ability to concentrate and pay attention to various information or not has been greatly impacted

during the pandemic. Derakshan and Eysenck (2009) found that anxiety impairs both inhibition and shifting attention. A research study on undergraduate students examining the effects of anxiety and situational stress on task shifting and task efficiency demonstrated that when interpreted in the context of Attentional Control Theory those with greater levels of anxiety perform more poorly on tasks requiring shifting attention and are also less efficient (Edwards et al., 2014).

Purpose of the Study

The purpose of this study will be to understand the impact of COVID-19 on White and non-White undergraduate and graduate students, particularly as it pertains to cognitive, affective, and motivational outcomes. Perceived stress and the influence of COVID-19, including support and disruption, will be examined as moderators of the relationship between symptoms of anxiety and depression, as well as motivational approach and sustained attention, as they vary across race. Individuals will complete a series of questionnaires measuring the distress and disruption COVID-19 created in their lives, in addition to scales measuring symptoms of anxiety, depression, perceived stress and motivation.

Research Questions

Given the lack of data of the effects of perceived stress in a pandemic on students' sustained attention, emotional and motivational processing the following questions are proposed:

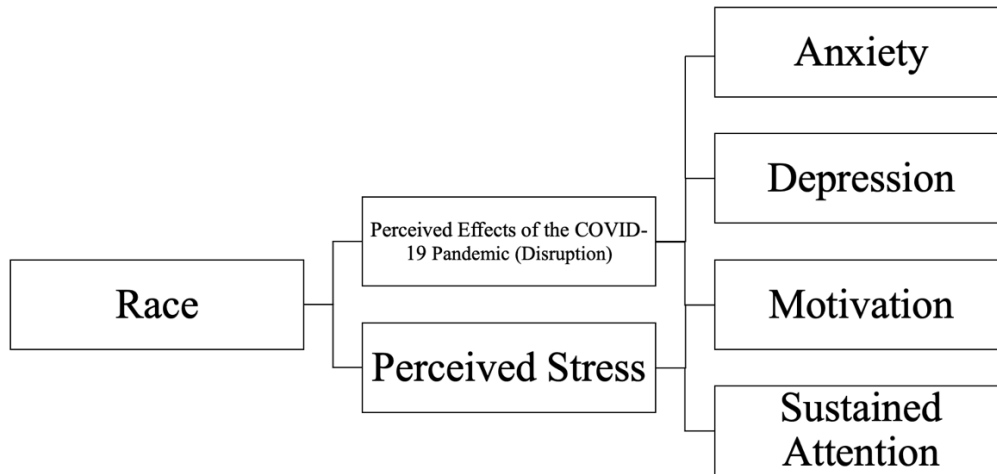
1. Are there racial differences in perceived stress related to the COVID-19 pandemic?
2. To what extent do perceived stress and perceived effects of the pandemic (pandemic total disruption) moderate the relationship between race and symptoms

of anxiety, depression, motivation, and sustained attention, particularly in non-Hispanic White students and Hispanic and non-White students?

- a. To what extent do perceived stress and perceived effects of the pandemic (pandemic total disruption) moderate symptoms of anxiety in non-Hispanic White students and Hispanic and non-White students during a pandemic?
- b. To what extent do perceived stress and perceived effects of the pandemic (pandemic total disruption) moderate symptoms of depression in non-Hispanic White students and Hispanic and non-White students during a pandemic?
- c. To what extent do perceived stress and perceived effects of the pandemic (pandemic total disruption) moderate effects of motivational approach in non-Hispanic White students and Hispanic and non-White students during a pandemic?
- d. To what extent do perceived stress and perceived effects of the pandemic (pandemic total disruption) moderate effects of sustained attention in non-Hispanic White students and Hispanic and non-White students during a pandemic?

Figure 1.

Model of Variables in Present Study



Note. Racial differences in perceived effects of the pandemic as it relates to anxiety, depression, motivation, and sustained attention.

Chapter 3: Method

Participants

Participants were graduate and undergraduate students (N=268) from a medium sized, private northeast school. The sample was 53.1% graduate students and 45.8% undergraduate students. The sample was 2.6% American Indian or Alaskan Native, 17.0% Asian, 5.2% Black or African American, 5.2% Hispanic, Latinx, or Spanish Origin, 1.8% Middle Eastern or North African, .7% Native Hawaiian or Pacific Islander, 62.7% White, 2.2% Multiple, .4% Unknown and 2.2% not reported. When comparing sample demographics to population demographics there were a larger percentage of White respondents, and a smaller representation of Black students. According to the university website, demographics of the medium sized, private northeast graduate school are as follows. Domestic students are predominantly White (51.8%), 15.1% are Asian, 14.2% are Hispanic, 12.2% are Black or African American, 3.5% did not report, 3.1% are two or more races, and 0.1% are Native Hawaiian or Other Pacific Islander. Approximately eighty percent (79.6) of the international student population is Asian, 5.1% are Latin American or Caribbean, 4.7% are North American, 4.5% are Middle Eastern or North African, 4.3% are European, 0.8% are Sub-Saharan African, 0.3% represent Oceania, and 0.6% are not reported. Approximately twenty six percent of the sample self-identified as international students, while 72% are not and 2.6% did not report domestic or international student status. According to the US Department of Education College Scorecard, overall enrollment by race and ethnicity at both the graduate and undergraduate level is as follows: 33% White, 15% Hispanic or Latino, 7% Black or African American, 17% Asian, 6% two or more races, less than 1 percent are American Indian or Alaska Native, and less than 1% are Native Hawaiian or Other Pacific Islanders, while about 4% chose not to report their race or ethnicity. Eighteen percent of students enrolled are

international students. The sample was 54.6% women and 39.5% male, 2.2% transgender and 1.8% non-binary/non-conforming and .7% not reported. Gender makeup of the student population at the graduate level is 78.3% female and 21.6% male, with .2% not reporting.

Design

This study design is correlational with the following dependent variables: depression, anxiety, regulatory focus (motivation), and sustained attention. The independent variable is race of students, split into White and non-White students. There are two moderators: self-reported COVID-19 experiences and related units of disruption or support and self-reported symptoms of perceived stress. According to a power analysis conducted using G*Power (Faul et al., 2009), it was determined that 302 students were necessary to complete this study.

Procedure

Participants were recruited via student listservs, postings on campus research boards and direct outreach to college departments, programs, and professors, as well as social media. Students were sent an electronic link via email to complete an informed consent form, a questionnaire on experiences during the COVID-19 pandemic, several other measures, discussed in Materials and a demographics questionnaire. The first few pages of the electronic link outlined the requirements of the study, information on participant rights, and an informed consent form with electronic signature capabilities. The rest of the pages of the electronic link included items on COVID-19 experiences, emotional and motivational processing, sustained attention, as well as demographics. The survey was expected to take about 30 minutes. Responses indicated that most respondents took between sixteen and 50 minutes to complete the survey, with the median at 22 minutes. The average time taken was 102 minutes. Students did not have to take the survey in one sitting; therefore, students may have left the survey open and come back to it over time.

Participants elected to enter a raffle to win an Amazon gift card, with a value of \$25 following completion of the survey. A total of 10 winners were selected. Participants could choose to leave the study at any point in time, with no adverse consequence.

Materials

Materials consisted of a questionnaire on COVID-19 experiences, measures of symptoms of Anxiety, Depression, and perceived stress, measures of sustained attention and regulatory focus, in addition to a demographics questionnaire, completed by all participants.

Demographics

The demographics questionnaire solicited information regarding gender, race, age, socioeconomic status, enrolled program, student status, expected year of graduation, and degree sought.

Outcome Measures

Anxiety: Generalized Anxiety Disorder Screener (GAD-7)

Participants completed the 7-item Generalized Anxiety Disorder Screener, which is a brief self-report measure of anxiety symptoms over the past two weeks, developed in alignment with symptoms as outlined in the DSM-IV (Spitzer et al., 2006). Items are rated on a scale from 0 (not at all) to 3 (nearly every day). Internal consistency was found to have a Cronbach's alpha of .92 and test-retest reliability of .83, as well as strong criterion validity (Spitzer et al., 2006). A study of the general population in Germany further supported the validity and reliability of the GAD-7 (Löwe, et al., 2008). Sample item includes "Over the last two weeks, how often have you been bothered by the following problems? Feeling nervous, anxious, or on edge." The higher the score, the greater the severity of possible anxiety symptoms. For the current sample Cronbach's Alpha was calculated, $\alpha=.909$, demonstrating excellent reliability. The GAD-7 items were

altered to measure symptoms over the past academic year (i.e., “Over the past academic year, how often have you been bothered by...”), and Cronbach’s Alpha was calculated based off of the adjusted 7 items ($\alpha=.914$), again demonstrating excellent reliability.

Depression: Patient Health Questionnaire (PHQ-9)

Participants completed the 9-item Patient Health Questionnaire Depression module, which is a brief self-report measure of depression symptoms, developed in alignment with symptoms outlined in the DSM-IV (Kroenke & Spitzer, 2002). Items are rated on a scale of 0 (not at all) to 3 (nearly every day), and total scores indicate a severity level from none to severe. Criterion and construct validity and reliability have been found to be adequate, with a Cronbach’s alpha of .89, and test-retest reliability of .84 (Kroenke et al., 2001). Sample item includes “Over the last 2 weeks, how often have you been bothered by any of the following problems?... Feeling down, depressed, or hopeless.” The higher the score, the greater the severity of possible depression symptoms. For the current sample Cronbach’s Alpha was calculated on 9 items, $\alpha = .899$, indicating good reliability. For the 9 items measuring the past year (i.e., “Over the past academic year, how often have you been bothered by...”), reliability was good, $\alpha=.898$.

Motivation: Regulatory Focus Questionnaire

Participants completed the 11-item Regulatory Focus Questionnaire, which is a self-report measure of promotion versus prevention regulatory focuses or motivational approaches (Higgins et al., 2001). Items are rated on a scale from 1 (never or seldom) to 5 (very often). The Cronbach’s alpha for promotion items is .73, while for prevention items it is .80. Test-retest reliability was demonstrated with a population of undergraduate students at the .79 and .81 levels for promotion and prevention, respectively (Higgins et al., 2001). Sample item includes “How often have you accomplished things that got you "psyched" to work even

harder?” Items are split between the promotion and prevention scale, and reverse scored accordingly. For the current sample the Promotion scale Cronbach’s Alpha was calculated on 6 items, $\alpha = .618$, indicating questionable reliability. For the 5 items measuring Prevention focus, reliability was acceptable, $\alpha=.758$.

Sustained Attention: Attention Control Scale (ATTC)

Participants completed the 20-item Attention Control Scale, which is a self-report measure of differences in attentional control, specifically attention focusing and shifting (Quigley et al., 2017). Items are rated on a scale from 1 (almost never) to 4 (always). Good internal consistency was demonstrated with a Cronbach’s Alpha of .87 (Quigley et al., 2017). Test-retest reliability was demonstrated at .61 (Abasi et al., 2017). Sample item includes “Please indicate how strongly each statement applies to you...It’s very hard for me to concentrate on a difficult task when there are noises around.” The higher the score, the greater level of attentional control. Cronbach’s Alpha was calculated for this 20-item scale, $\alpha=.793$, demonstrating acceptable reliability.

Moderators

Perceived Stress: Perceived Stress Scale (PSS)

Participants completed the 10-item Perceived Stress Scale, which is a self-report measure of the “degree to which individuals appraise situations in their lives as stressful” (Cohen et al., 1983, p. 385). Items are rated on a scale from 0 (never) to 4 (very often). Studies have demonstrated Cronbach’s alpha greater than .70, with a range from .74 to .91, and test-retest reliability at about .70 (Lee, 2012). Sample item includes “In the last month, how often have you been upset because of something that happened unexpectedly?” The higher the score, the greater the severity of perceived stress. Cronbach’s Alpha was calculated for this 10-item scale measuring symptoms over the past month $\alpha=.766$, demonstrating acceptable reliability. When

measuring reliability of items adjusted to measure symptoms over the past year (i.e., In the last academic year, how often have you...”) $\alpha=.784$, again demonstrating acceptable reliability.

COVID-19 Pandemic: COVID-19 Pandemic Disruption

The COVID-19 Pandemic questionnaire was developed for this study after holding focus groups with masters and doctoral level students in a psychology program. Questions asked in the focus groups were open ended and aimed to address academic and emotional concerns in the shift to online learning, changes in routine and lifestyle, coursework expectations and previous experiences managing in crisis (see Appendix A). Major themes were then identified across focus groups and used to create a long form questionnaire measuring distress across domains impacted by the COVID-19 pandemic (see Appendix B). Further, other questionnaires measuring well-being outcomes during the pandemic were reviewed and incorporated as relevant (Whitlock, 2020; Behar-Zusman et al., 2020; Yang, 2014; Stoddard & Kaufman, 2020; Forrest et al., 2021; Adamson et al., 2020; Nicholas, n.d.; SurveyMonkey, n.d.; Robledo & Morrow, 2020). Approximately $\frac{1}{3}$ of items were developed from themes identified in the focus groups, while $\frac{2}{3}$ of items were developed based on existing COVID-19 surveys. The COVID-19 pandemic questionnaire addresses changes to lifestyle and routine across areas such as online learning, employment, living environment, experience of COVID-19 symptoms and related stressors. Items from the questionnaire were used to create multiple disruptor variables (see table 1). Items assessing changes to student program trajectory, online learning adaptations, challenges in work/life balance, productivity, effort, and changes in living situations, in addition to COVID diagnosis, risk factors, symptoms, lifestyle changes and access to resources contributed to a total disruptor variable. Table 1 outlines the subcategories of disruption and the number of items that contributed to each subcategory. All Likert scale items across subcategories were combined to

calculate a total disruption Likert score (total disruption) for greater variability and differences in data.

Table 1.

Demographic and COVID-19 Questionnaire

Variable Name	Subcategory	Number of Items	Response Type
Demographic		15	Various
Disruption	Academic	2	Yes/No
		3	Likert
	Academic – Online Learning	14	Yes/No
		2	Likert
	COVID Factors	10	Yes/No
		3	Likert
	Feelings	5	Yes/No
	Lifestyle	2	Yes/No
		8	Likert
	Living	4	Yes/No
1		Likert	
Racial Justice	2	Likert	
Work	2	Yes/No	
	1	Other	

Note. Breakdown of disruptor items in the COVID-19 questionnaire.

Analyses

SPSS Version 28 (2021) and RStudio were used to conduct statistical analyses. First, descriptive statistics were generated and Pearson correlations were calculated to assess associations between the independent variable and dependent variables. A multivariate analysis of variance (MANOVA) was run to examine differences between non-Hispanic White students and Hispanic and non-White students in regard to pandemic disruption, perceived stress, anxiety, depression, promotion, prevention, and sustained attention. A Bonferroni correction was completed to correct for type 1 error rates, bringing the p-value to .01. A hierarchical regression analysis was used to assess effects of the moderators on each dependent variable individually.

All continuous variables were centered to understand the effect of perceived stress and COVID-19 support and disruption on anxiety, depression, motivation, and sustained attention.

Chapter 4: Results

In the results chapter I will present comprehensive findings based on the research questions. In order to gain greater understanding of the survey participants as it relates to racial differences in perceived stress and perceived disruption in the COVID-19 pandemic across cognition, motivation and affect descriptive statistics were computed. See Table 2 for the means and standard deviations of moderator and dependent variables.

Table 2.

Means and Standard Deviations of Moderators and Dependent Variables

DV	White Students			Non-White, Hispanic Students			Total N
	Mean	SD	N	Mean	SD	N	
Academic Disruption	34.0698	6.5869	159	30.1919	7.8007	88	247
Online (academic) Disruption	39.4942	6.8043	146	38.9899	7.2850	81	227
Work Disruption	3.1105	0.7291	79	3.1717	0.6707	42	121
Living Disruption	36.4477	3.1775	61	35.4343	5.1511	32	93
COVID Disruption	7.5233	0.8816	14	7.2121	0.9612	17	31
Lifestyle Disruption	69.7849	11.6446	145	66.4545	15.6930	86	231
Total Disruption	2.8411	0.4830	156	3.0782	0.6070	90	246
RFQ Prevention	3.4091	0.7712	154	3.4854	0.8691	89	243
GAD7	15.6538	5.1627	156	16.7312	5.4735	93	249
PHQ9	23.0138	5.4186	145	23.7701	5.8104	87	232
RFQ Promotion	3.3225	0.6489	154	3.4356	0.5765	88	242
PSS	20.5705	5.3329	156	21.1667	5.4096	90	246

ATTC	50.5972	7.6207	153	49.0682	8.0996	88	241
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Note. PHQ9 = Patient Health Questionnaire, GAD7 = Generalized Anxiety Disorder Screener, RFQ = Regulatory Focus Questionnaire, split into promotion and prevention, PSS = Perceived stress scale.

Correlations

Correlations among the dependent variables for the total sample are displayed in Table 3. When analyzing correlations among the total sample, total attention is significantly negatively correlated with depression symptoms, anxiety symptoms, total disruption, and symptoms of perceived stress, while it is significantly positively correlated with prevention and promotion. Therefore, as attentional control increases, it is correlated with decreased reports of symptoms of depression, anxiety, and perceived stress, but increased reports of total disruption. Symptoms of depression are significantly positively correlated with anxiety symptoms, total disruption, and perceived stress symptoms, but significantly negatively correlated with prevention and promotion. This indicates that as symptoms of depression increased individuals associated less with prevention or promotion motivation. Reported symptoms of anxiety is significantly positively correlated with total disruption and symptoms of perceived stress, while it is significantly negatively correlated with prevention. It is not significantly correlated with promotion. Therefore, those who reported more symptoms of anxiety also experienced more perceived stress, but lower levels of disruption. Total disruption is significantly positively correlated with perceived stress, but it is not significantly correlated with promotion. Prevention is significantly positively correlated with promotion and negatively correlated with perceived stress. As individuals worked to master content, they also worked to not fail and reported lower levels of perceived stress. It is typically expected that promotion and prevention will have an

approximate .11 correlation. Promotion is significantly negatively correlated with perceived stress. As individuals work to not fail they report lower levels of perceived stress.

Table 3.

Pearson Correlations Moderators and Dependent Variables for Total Sample (N=268)

Variables	1	2	3	4	5	6	7
1. Total Attention	--						
2. PHQ9 Past Year	-0.3378**	--					
3. GAD7 Past Year	-0.2727**	0.6909**	--				
4. Total Disruption	-0.3142**	0.2166**	0.2512**	--			
5. RFQ Prevention	0.2019**	-0.3949**	-0.2276**	-0.1397	--		
6. RFQ Promotion	0.3061**	-0.2482**	-0.1004	-0.1068	0.2803**	--	
7. PSS Year	-0.4554**	0.5276**	0.5487**	0.3040**	-0.2263**	-0.2508**	--

Note. PHQ9 = Patient Health Questionnaire, GAD7 = Generalized Anxiety Disorder Screener, RFQ = Regulatory Focus Questionnaire, split into promotion and prevention, PSS = Perceived stress scale.

* $p < .05$, ** $p < .01$.

MANOVA

A MANOVA was completed to assess differences between groups based on race across perceived stress, COVID disruption, anxiety, depression, motivation, and attention. Using an alpha level of .05, the test is significant, *Wilk's* $\lambda = .95$, $F(5, 265) = 2.562$, $p < .028$. *Wilk's* lambda is the most commonly used statistic in public health research. This significant *F* value indicates that there are significant differences among the White and non-White and Hispanic student (white) groups on a linear combination of the five dependent variables. See table 4.

Therefore, there are differences between racial groups in the study outcome measures, however further statistical tests are necessary to determine which outcome measures are significant.

Table 4.

MANOVA demonstrating difference in race groups across five dependent variables.

Effect	Statistic	Value	F Value	Num DF	Den DF	p-value	Partial eta squared
Intercept	Wilks' lambda	0.0265	1948.6181	5.0000	265.0000	0.0000	0.9735
white	Wilks' lambda	0.9539	2.5626	5.0000	265.0000	0.0276*	0.0461

* $p < .05$.

One-way ANOVAs

A series of post-hoc one-way ANOVAs were calculated to determine the significance of the relationships between the independent variables and each moderator and dependent variables. This allows for a greater understanding of which variables demonstrate a significance between White and non-White and Hispanic students when considering total attention, depression, anxiety, total disruption, and promotion and prevention motivation approaches. It is of note that the sample represented a larger percentage of non-Hispanic White students than the population, limiting generalizability and limiting significant findings. A one-way between-subjects ANOVA was conducted to compare the difference in race on total attention between non-Hispanic White and non-White and Hispanic students. There was no significance of race on total attention for the two groups [$F(2, 235)=1.51, p=.221$]. See Table 5.

Table 5.

ANOVA results with total attention as the predictor

Predictor	Sum of Squares	df	Mean Square	F	p-value
Between	76.9491	2	38.47455	1.5104	0.2207

Residual	9272.2641	235
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* $p < .05$.

A one-way between-subjects ANOVA was conducted to understand the relationship between race and symptoms of depression in non-Hispanic White and non-White and Hispanic students. There was no significance of race on symptoms of depression for the two groups [$F(2, 236) = 2.25, p = .135$]. See Table 6.

Table 6.

ANOVA results with depression as the predictor

Predictor	Sum of Squares	df	Mean Square	F	p-value
Between	66.0897	2	33.04485	2.2508	0.1353
Residual	5344.074995	236			

* $p < .05$.

A one-way between-subjects ANOVA was conducted to compare the difference in race on symptoms of anxiety between non-Hispanic White and non-White and Hispanic students. See Table 7. There was no significant effect of race on symptoms of anxiety for the two groups [$F(2, 253) = 2.42, p = .121$].

Table 7.

ANOVA results with anxiety as the predictor

Predictor	Sum of Squares	df	Mean Square	F	p-value
Between	59.7143	2	29.85715	2.4216	0.1214
Residual	4487.8692	253			

* $p < .05$.

A one-way between-subjects ANOVA was conducted to compare the relationship between race and total disruption between non-Hispanic White and non-White and Hispanic students. There was a significant effect of race on total disruption for the two groups [$F(1, 182) = 10.45, p = .001$]. See table 8. White students ($M = 2.8, SD = .48$) reported significantly higher

levels of disruption $t(261)=-3.53, p=.001$, when compared to non-White and Hispanic students ($M=3.07, SD=.61$) on yes/no items. However, when total disruption was broken down further non-White and Hispanic students reported greater levels of disruption than White students in academic, living situations, COVID and lifestyle levels, as well as on total disruption measured by Likert scale items and total disruption measured by Likert and yes/no items ($M=240.15, SD=27.22$). Therefore, non-Hispanic White students reported more sources of disruption than non-White and Hispanic students, however when rating the extent of disruption on Likert items non-White and Hispanic students reported greater levels of disruption.

Table 8.

ANOVA results with total disruption as the predictor

Predictor	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	p-value
Between	3.0416	1	3.0416	10.4479	0.0015*
Residual	52.98439	182			

* $p<.05$.

A one-way between-subjects ANOVA was conducted to compare the difference in race on the promotion motivation approach between non-Hispanic White and non-White and Hispanic students. See table 9. There was no significance of race on promotion motivation approach for the two groups [$F(2, 245)=.66, p=.417$].

Table 9.

ANOVA results with promotion motivation as the predictor

Predictor	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	p-value
Between	0.2251	2	0.11255	0.6633	0.4165
Residual	61.768699	245			

* $p<.05$.

Finally, a one-way between-subjects ANOVA was conducted to compare the relationship between race and the prevention motivation approach between non-Hispanic White and non-White and Hispanic students. There was no significance of race on prevention motivation approach for the two groups [$F(2, 246)=.15, p=.692$]. See table 10.

Table 10.

ANOVA results with prevention motivation as the predictor

Predictor	Sum of Squares	df	Mean Square	F	p-value
Between	0.1018	2	0.0509	0.1572	0.6922
Residual	117.857933	246			

* $p < .05$.

Hierarchical Regressions

Prior to conducting hierarchical multiple regressions, the relevant assumptions were tested. All assumptions were met. A series of hierarchical multiple regressions were conducted, one with each dependent variable. Race was entered at step one of the regressions. The moderating variables, symptoms of perceived stress and total disruption were entered at step two, and the interaction variables of race and perceived stress, and race and total disruption were entered at step three. Variables were entered in this order to understand the moderating relationship between perceived stress, total disruption and each dependent variable, as well as the interactions.

Total attention was regressed on race, perceived stress, and total disruption. The hierarchical multiple regression revealed that at step one, race predicted less than 1% of the variance in total attention. See Table 11. The inclusion of perceived stress (PSS) and total disruption at step two led to a significant increase in the variance accounted for by the model ($R^2_{adj} = .21, p < .001$). Therefore, step two of the regression model predicted approximately 22% of

the variance in total attention ($R^2=.22$, $F(3, 264)=24.74$, $p<.001$), with perceived stress as a significant predictor ($\beta=-.4357$, $p<.001$). At step 3, the interaction terms for race and perceived stress ($\beta=.0964$, $p=.768$) and race and total disruption ($\beta=-0.0101$, $p=.938$) were not statistically significant, however perceived stressed continued to be significant ($\beta=-.4556$, $p<.001$). Therefore, the levels of perceived stress and total disruption do not significantly moderate the differences in reported total attention, despite the main effect of perceived stress on total attention. Overall, the model demonstrates that race does not explain much variance in the model, but total attention was significantly predicted by perceived stress. Therefore, those reporting greater levels of perceived stress also reported greater difficulty sustaining attention.

Table 11.

Hierarchical regression model of variables predicting Total Attention

	Total Attention			
	ΔR^2	<i>B</i>	<i>SE B</i>	β
Step 1	-0.0037			
Race		-0.0176	0.1487	-0.0072
Step 2	0.2106**			
Race		-0.1064	0.1323	-0.0439
Perceived Stress		-0.6573	0.0862	-0.4357**
Disruption		0.7025	0.4546	0.0882
Step 3	0.2059			
Race		-0.4231	1.1975	-0.1745
Perceived Stress		-0.6873	0.1262	-0.4556**
Disruption		0.7680	0.6242	0.0964
Race X Perceived Stress		0.0179	0.0608	0.1373
Race X Disruption		-0.0203	0.2603	-0.0101
Total R^2	0.420			

Note. PSS= Perceived Stress Scale.

* $p<.05$, ** $p<.01$.

Symptoms of depression were regressed on race, perceived stress, and total disruption. The model revealed that at step one, race predicted less than 1% of the variance in symptoms of depression reported in the last year. The inclusion of perceived stress (PSS) and total disruption at step two led to a significant increase in the variance accounted for by the model ($R^2 \text{ adj.} = -.0019, p < .001$). See Table 12. Step two of the overall regression model predicted approximately 29% of the variance in symptoms of depression ($R^2 = .30, F(3, 264) = 38.78, p < .01$), with perceived stress as a significant predictor ($\beta = .5477, p < .001$). The interaction terms for race and perceived stress ($\beta = -.1872, p = .6689$) and race and total disruption ($\beta = -.1341, p = .2713$) were not statistically significant, however perceived stress continued to be significant ($\beta = .5681, p < .001$). Therefore, the levels of perceived stress and total disruption do not significantly moderate the differences in reported depression symptoms, despite the main effects of perceived stress and total disruption on depression symptoms. Depression symptoms are predicted by perceived stress. Therefore, those reporting greater levels of perceived stress also reported more symptoms of depression.

Table 12.

Hierarchical regression model of variables predicting Depression Symptoms (PHQ9 Year)

Predictor	Depression			
	ΔR^2	B	$SE B$	β
Step 1	-0.0019			
Race		-0.0776	0.1091	-0.04357
Step 2	0.298			
Race		-0.0039	0.0916	-0.0022
Perceived Stress		0.6066	0.0597	0.5477**
Disruption		-0.0961	0.3147	-0.0164
Step 3	0.2983			

Race	0.4006	0.8264	0.2250
Perceived Stress	0.6292	0.0871	0.5681**
Disruption	0.2575	0.4307	0.0440
Race X Perceived Stress	-0.0180	0.0419	-0.1872
Race X Disruption	-0.1981	0.1797	-0.1341
Total R^2	0.5944		

Note. PHQ9 = Patient Health Questionnaire, PSS= Perceived Stress Scale.

* $p < .05$, ** $p < .01$.

Next, reports of anxiety symptoms were regressed on race, perceived stress, and total disruption. When considering symptoms of anxiety reported over the course of the past year, the hierarchical multiple regression model revealed that at step one, race predicted less than 1% of the variance in symptoms of anxiety reported in the last year. See Table 13. The inclusion of perceived stress (PSS) and total disruption at step two led to a significant increase in the variance accounted for by the model ($R^2 \text{ adj.} = .23, p < .01$). Step two of the regression model predicted approximately 24% of the variance in symptoms of anxiety ($R^2 = .24, F(3, 264) = 28.95, p < .01$), with perceived stress as a significant predictor, ($\beta = .4807, p < .001$). The interaction terms for race and perceived stress ($\beta = -.5161, p = .2581$) and race and total disruption ($\beta = -.1813, p = .1536$) were not statistically significant, however perceived stress continued to be significant ($\beta = .5455, p < .001$). Therefore, the levels of perceived stress and total disruption do not significantly moderate the differences in reported anxiety symptoms, despite the main effect of perceived stress on anxiety symptoms. Overall, the regression model is not significant, however anxiety symptoms are significantly predicted by perceived stress. Therefore, those reporting greater levels of perceived stress also reported more symptoms of anxiety.

Table 13.*Hierarchical regression model of variables predicting anxiety symptoms (GAD7 Year)*

	Anxiety			
	ΔR^2	<i>B</i>	<i>SE B</i>	β
Step 1	0.0022			
Race		-0.1228	0.0978	-0.0767
Step 2	0.239			
Race		-0.0629	0.0857	-0.0393
Perceived Stress		0.4785	0.0558	0.4807**
Disruption		-0.1930	0.2945	-0.0367
Step 3	0.2392			
Race		0.8391	0.7734	0.5243
Perceived Stress		0.5430	0.0815	0.5455**
Disruption		0.2028	0.4031	0.0386
Race X Perceived Stress		-0.0445	0.0392	-0.5161
Race X Disruption		-0.2406	0.1681	-0.1813
Total R^2	0.4804			

Note. GAD7 Year = Generalized Anxiety Disorder Screener, adjusted for the last academic year,

PSS= Perceived Stress Scale.

* $p < .05$, ** $p < .01$.

The promotion motivation approach was then regressed on race, perceived stress, and total disruption. The hierarchical multiple regression model revealed that at step one, race predicted less than 1% of the variance in the promotion motivational approach. The inclusion of perceived stress (PSS) and total disruption at step two led to a significant increase in the variance accounted for by the model ($R^2 \text{ adj.} = .18, p < .01$). See table 14. Step two of the regression model predicted approximately 18% of the variance in promotion ($R^2 = .19, F(3, 264) = 20.94, p < .01$),

with perceived stress as a significant predictor, ($\beta = -.4354, p < .001$). The interaction terms for race and perceived stress ($\beta = -.3062, p = .518$) and race and total disruption ($\beta = -.0851, p = .519$) were not statistically significant, however perceived stress continued to be significant ($\beta = -.3960, p < .001$). Therefore, the levels of perceived stress and total disruption do not significantly moderate the differences in promotion motivation approach, despite the main effect of perceived stress on promotion approach. Promotion is significantly predicted by perceived stress.

Therefore, those reporting greater levels of perceived stress also reported greater association with promotion motivation.

Table 14.

Hierarchical regression model of variables predicting promotion motivation (RFQ Promotion)

	Promotion			
	ΔR^2	<i>B</i>	<i>SE B</i>	β
Step 1	-0.0033			
Race		0.0039	0.0114	0.0210
Step 2	0.183			
Race		-0.0022	0.0103	-0.0118
Perceived Stress		-0.0503	0.0067	-0.4354**
Disruption		0.0071	0.0354	0.0117
Step 3	0.1782			
Race		0.0586	0.0933	0.3152
Perceived Stress		-0.0458	0.0098	-0.3960**
Disruption		0.0278	0.0487	0.0455
Race X Perceived Stress		-0.0031	0.0047	-0.3062
Race X Disruption		-0.0131	0.0203	-0.0851
Total R^2	0.3579			

Note. RFQ Promotion = Regulatory Focus Questionnaire, promotion approach.

* $p < .05$, ** $p < .01$.

The prevention motivation approach was then also regressed on race, perceived stress, and total disruption. The hierarchical multiple regression model revealed that at step one, race predicted less than 1% of the variance in the prevention motivational approach. See Table 15. The inclusion of perceived stress (PSS) and total disruption at step two led to a significant increase in the variance accounted for by the model ($R^2 \text{ adj.} = .11, p < .01$). Step two of the overall regression model predicted approximately 10% of the variance in prevention ($R^2 = .11, F(3, 264) = 12.4, p < .01$), with perceived stress as a significant predictor, ($\beta = -.3266, p < .001$). The interaction terms for race and perceived stress ($\beta = .2489, p = .614$) and race and total disruption ($\beta = .1131, p = .410$) were not statistically significant, however perceived stress continued to be significant ($\beta = -.3567, p < .001$). Therefore, the levels of perceived stress and total disruption do not significantly moderate the differences in prevention motivation approach, despite the main effect of perceived stress on the prevention approach. Prevention is significantly predicted by perceived stress. Therefore, those reporting greater levels of perceived stress also reported greater association with prevention motivation.

Table 15.

Hierarchical regression model of variables predicting prevention motivation (RFQ Prevention)

	Prevention			
	ΔR^2	<i>B</i>	<i>SE B</i>	β
Step 1	0.0017			
Race		0.0174	0.0145	0.0735
Step 2	0.1135			
Race		0.0111	0.0137	0.0468
Perceived Stress		-0.0481	0.0089	-0.3266**
Disruption		0.0383	0.0470	0.0493
Step 3	0.1095			
Race		-0.0553	0.1238	-0.2335

Perceived Stress	-0.0525	0.0131	-0.3567**
Disruption	0.0004	0.0645	0.0005
Race X Perceived Stress	0.0032	0.0063	0.2489
Race X Disruption	0.0222	0.0269	0.1131
Total R^2	0.2247		

Note. RFQ Prevention = Regulatory Focus Questionnaire, prevention approach.

* $p < .05$.

In sum, while race was not a significant predictor of any of the dependent variables, perceived stress explained significant variance for each of the dependent variables.

T-tests

In order to further understand the significance of disruption as it pertains to race, a series of t-tests were run. When considering the scores, it is important to note that disruption scores were calculated on a Likert scale from 1 to 5, with 1 demonstrating the greatest disruption and 5 demonstrating the highest disruption, and then summed across each subcategory. Therefore, lower scores demonstrate reports of higher levels of disruption. T-test scores of total disruption and disruption subcategories according to race is reported in Table 16. White students ($M=2.8$, $SD=.48$) reported significantly higher levels of disruption $t(261)=-3.53$, $p=.001$, when compared to non-White and Hispanic students ($M=3.07$, $SD=.61$). When looking at the total disruption score broken down into various areas of disruption, we see that non-White and Hispanic students ($M=30.19$, $SD=7.8$) report significantly higher levels of general academic disruption $t(261)=4.36$, $p<.001$, than White students ($M=34.07$, $SD=6.57$). Further, non-White and Hispanic students ($M=7.21$, $SD=.96$) reported significantly higher levels of disruption related to COVID $t(261)=2.71$, $p=.007$, than White students ($M=7.52$, $SD=.88$). There were significantly higher levels of disruption reported at the .05 level for living status: non-White and Hispanic students ($M=35.43$, $SD=5.15$) than White students ($M=36.45$, $SD=3.18$); $t(261)=2.00$, $p=.046$. Non-White

and Hispanic students ($M=66.45$, $SD=.15.69$) reported significantly higher levels of disruption related to lifestyle $t(261)=1.99$, $p=.048$, than White students ($M=69.78$, $SD=11.64$). In sum, there were differences across racial groups in how individuals experienced disruption, particularly evident in academic, living situations, COVID and lifestyle disruptions as well as total disruption. However, the data did not demonstrate that any other outcome variables were significantly related to race.

Table 16.

T-test scores for total disruption and disruption broken down by category for White students and Non-White and Hispanic students.

DV	White Students		Non-White, Hispanic Students		df	t	p	p-value Bonferroni	effect size	power
	Mean	SD	Mean	SD						
Academic Disruption	34.0698	6.5869	30.1919	7.8007	261	4.3581	.0000*	.0001**	0.5498	0.7826
Online (academic) Disruption	39.4942	6.8043	38.9899	7.2850	261	0.5724	.5675	1.0000	0.0722	0.0646
Work Disruption	3.1105	0.7291	3.1717	0.6707	261	0.6854	.4937	1.0000	0.0865	
Living Disruption	36.4477	3.1775	35.4343	5.1511	261	2.0028	.0462*	.3234	0.2527	0.1019
COVID Disruption	7.5233	0.8816	7.2121	0.9612	261	2.7060	.0072*	.0507	0.3414	
Lifestyle Disruption	69.7849	11.6446	66.4545	15.6930	261	1.9904	.0476*	.3329	0.2511	0.6488
Total Disruption	2.8411	0.4830	3.0782	0.6070	261	3.5359	.0005*	.0033**	0.4461	

* $p<.05$, ** $p<.01$.

With regards to perceived stress, White students ($M=19.63$, $SD=5.06$) did not report significantly different levels of perceived stress $t(261)=-.377$, $p=.706$, when compared to non-

White and Hispanic students ($M=19.88$, $SD=5.65$). See Table 17. All students regardless of race experienced similar levels of perceived stress.

Table 17.

T-test scores for perceived stress according to White students and Non-White and Hispanic students.

	White Students		Non-White, Hispanic Students		<i>df</i>	<i>t</i>	effect		
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>			size	power	p-value
PSS									
Year	19.6279	4.4303	19.8788	4.4586	261	-0.3766	0.0475	0.0536	0.7068

* $p < .05$, ** $p < .01$.

Supplemental Analysis

When exploring the data further, income and student status were used as alternative independent variables to determine significance across race groups. Students were asked to report their personal income, which some students may have interpreted to be their sole income, while others may have reported a family income that they rely on as students. Income level was initially collected in increments of \$24,999. Groups were created in \$50,000 increments of income level to demonstrate a difference between the groups. The sample represented 57.5% of individuals making less than \$50,000 ($n=154$), 27.2% making \$50,000-\$99,999 ($n=73$) and 8.6% making over \$100,000. 6.7% of participants preferred not to answer. A one-way between-subjects ANOVA was conducted to compare the relationship between income and total attention between the less than \$50,000, \$50,000 to \$99,999, and greater than \$100,000 groups. See table 18. There was a significant effect of income on total attention between groups [$F(3,232)=6.049$, $p < .001$]. There was a significant difference between the less than \$50,000 and greater than \$100,000 groups, $t(175) = -3.8017$, $p = .0006$, and the \$50,000 to \$99,999, and greater than

\$100,000, $t(94) = -3.3256$, $p = .0038$. Therefore, those with lower income have greater difficulties sustaining attention.

Table 18.

ANOVA results of income with total attention

Predictor	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	p-value
Between	1013.313	3	337.772	6.049	0.0018**
Residual	13953.857	232	55.836		

* $p < .05$, ** $p < .01$.

A one-way between-subjects ANOVA was conducted to compare difference in income on symptoms of anxiety between the less than \$50,000, \$50,000 to \$99,999, and greater than \$100,000 groups. See table 19. There was a significant effect of income on symptoms of anxiety between groups [$F(3,259)=2.87$, $p=.038$]. There was a significant difference between the less than \$50,000 and between \$50,000 to \$99,999 groups, $t(213) = 1.453$, $p < .001$. Individuals who reported lower income experienced greater levels of anxiety.

Table 19.

ANOVA results of income and anxiety symptoms

Predictor	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	p-value
Between	212.3676	3	70.7892	2.8708	0.0378*
Residual	7672.6	258			

* $p < .05$, ** $p < .01$.

A one-way between-subjects ANOVA was conducted to compare the relationship between income on prevention motivation approach between less than \$50,000, \$50,000 to \$99,999, and greater than \$100,000. There was a significant effect of income on prevention motivation approach between groups [$F(3,243)=2.881$, $p=.037$]. See table 20. There was a significant difference between the less than \$50,000 and between \$50,000 to \$99,999 groups,

$t(210) = .718, p = .013$. Lower income individuals demonstrated a slightly stronger prevention approach, and therefore were more likely to be motivated to not fail than higher income groups.

Table 20.

ANOVA results of income and prevention motivation

Predictor	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	p-value
Between	5.458	3	1.819	2.881	0.037*
Residual	153.907	243	.631		

* $p < .05$, ** $p < .01$.

When looking at student status, a one-way between-subjects ANOVA was conducted to compare the difference in student status on symptoms of anxiety between graduate and undergraduate students. There was a significant effect of student status on symptoms of anxiety between groups [$F(1,252) = 3.725, p = .055$]. See table 21. There was a significant difference between the graduate and undergraduate students, with greater levels of anxiety reported in graduate students.

Table 21.

ANOVA results of student status and anxiety

Predictor	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	p-value
Between	103.731	1	103.731	3.725	0.055*
Residual	7017.233	252	27.846		

* $p < .05$, ** $p < .01$.

A one-way between-subjects ANOVA was conducted to compare the relationship between student status on promotion motivational approach between international and domestic students. See table 22. There was a significant effect of student status on promotion motivational approach between groups [$F(1,244) = 5.69, p = .002$]. There was a significant difference between the international and domestic student groups, $t(244) = -2.386, p < .018$, with domestic students

aligning stronger with promotion approach (M=3.4198, SD=.64739) than international students (M=3.2022, SD=.51560).

Table 22.

ANOVA results of student status and promotion motivational approach

Predictor	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	p-value
Between	2.173	1	2.173	5.697	0.0020**
Residual	93.067	244	.381		

*p<.05, **p<.01.

Chapter 5: Discussion

Approximately three years after the initial surge of business shutdowns and societal changes designed to reduce and stop the spread of COVID-19, society has returned to “normal” for Americans in most ways. Businesses are open, individuals have returned to work in person or with hybrid options, and schools and universities have returned to offering classes in person with some continued virtual offerings. Many COVID-19 restrictions, such as mask and vaccination requirements, have been dropped at the federal and state levels, leaving requirements up to individual businesses (Rough & Markowitz, 2023). Despite the “return to normal,” the infectious disease (COVID-19) caused by the SARS-CoV-2 virus continues to infect individuals and as of March 2022 there are well over 759 million cases globally and over 102 million cases nationally (*WHO coronavirus (COVID-19) dashboard*). There have been over 6 million deaths globally, and over 1 million deaths in the US (*WHO coronavirus (COVID-19) dashboard*). While the world has resumed functioning in a way that is both representative of 2020 and informed by the adaptations and experiences during the pandemic, there are many differences between now and 2020, and it is incredibly difficult to quantify the impact of COVID-19 beyond the number of deaths.

The purpose of this study was to evaluate the impact of general perceived stress related to COVID-19 and disruption caused by COVID-19 across race, particularly between non-Hispanic White and non-White and Hispanic graduate and undergraduate students. Outcome measures focused on sustained attention, motivation, symptoms of depression, and symptoms of anxiety. Perceived stress and the perception of COVID-19 disruption were examined as moderators of the relationship between race and the outcome measures.

It was hypothesized that while all students experienced changes across their daily, personal, and professional lives, the effects of structural racism on experiences of non-White and Hispanic students likely exacerbated perceived stress in the context of the pandemic as compared to White students. According to the results of a t-test, there were no significant differences in perceived stress between groups of students, with the mean score of both groups falling around 19, representing moderate levels of perceived stress. Therefore, all students regardless of race experienced similar levels of perceived stress. The current results are consistent with Adamson et al. (2020) who found a mean score of 19.08 when measuring perceived stress in individuals across 57 countries during COVID-19. Findings were also consistent with a study measuring perceived stress in the undergraduate college student population in the US during the spring and summer of 2020, which found no significant differences in reported perceived stress across racial groups (Hoyt et al., 2021). Due to the already stressful nature of higher education and the unknown stressors of the pandemic, it is not too surprising that individuals of all racial groups reported similar levels of perceived stress. That said, it is possible that the types of stressors may have varied between groups. For example, stressors related to microaggressions or systematic racism may have contributed more to overall levels of perceived stress among the non-White and Hispanic students while other stressors may have been more poignant for the White group.

This study also sought to demonstrate the extent to which perceived stress and perceived effects of the pandemic, measured in the extent of disruption to various areas of daily life, moderated the relationship between race and symptoms of anxiety, depression, motivation and sustained attention between non-Hispanic White students and Hispanic and non-White students. It was predicted that perceived stress and perceived effects of the pandemic would be significant predictors of the relationship between race and symptoms of anxiety, depression, motivation, and

sustained attention between non-Hispanic White students and Hispanic and non-White students. The results of a MANOVA, which was computed to understand the effect race has on the moderators and outcome measures, was significant. This indicated that there was a main effect of race across symptoms of anxiety, depression, motivation, and sustained attention. A series of post-hoc one-way ANOVAS were calculated to determine the specific significance of the effect of race in symptoms of anxiety, depression, motivation, and sustained attention. There were significant differences among the non-Hispanic White students and Hispanic and non-White students in disruption, but not in perceived stress, anxiety, depression, motivation, or sustained attention. When looking at the differences between these groups in greater depth, non-Hispanic White students reported greater levels of disruption across yes/no items, while Hispanic and non-White students reported greater levels of disruption across Likert items and all disruption items. Therefore, non-Hispanic White students reported more sources of disruption than non-White and Hispanic students, however when rating the extent of disruption on Likert items non-White and Hispanic students reported greater levels of disruption. Lower disruption scores indicated greater levels of disruption due to the direction of the Likert scales and coding of items. When disruption was broken down further, t-tests demonstrated significant differences across racial groups on academic, living, COVID, and lifestyle disruption scores. On each of these scales Hispanic and non-White students reported greater levels of disruption than non-Hispanic White students, which was consistent with the hypothesis that Hispanic and non-White students would experience greater levels of disruption than non-Hispanic White students during COVID-19. This study was the first to explore COVID impact measured in these subscales of disruption.

In order to further understand this question, a series of hierarchical regressions were run to explore the main effects of perceived stress and perceived disruption, as well as the interaction

with race on outcome measures. Results across multiple hierarchical regressions for each outcome measure demonstrated that perceived stress was a significant predictor of each outcome, which was evident in the second and third steps. Therefore, perceived stress significantly predicted total attention, prevention motivation, promotion motivation and symptoms of depression and anxiety; where prevention motivation refers to working to avoid failure and promotion motivation refers to working towards content mastery. Participants reported greater levels of perceived stress, which indicated they also reported higher levels of symptoms of depression and anxiety, greater difficulty sustaining attention and a stronger likelihood of using both the motivation approach to avoid failure, prevention, and that to master content, promotion.

There were no significant interaction effects between race and perceived stress or perceived disruption caused by the pandemic. The limited difference by racial groups is likely related to the pervasive effects of the pandemic and pervasive levels of stress in higher education when considering the impact on outcome measures. Further, due to the non-clinical nature of perceived stress, it is possible that this measure was most relatable and therefore significantly quantifiable to students at the time of the study, as compared to measures of anxiety and depression.

Pearson correlations identified the relation between dependent variables, many of which were significantly correlated. It was hypothesized that increased levels of perceived stress would be correlated with increased reports of symptoms of depression and anxiety, attention control and prevention motivation. On the other hand, it was hypothesized that increased levels of perceived stress would be negatively correlated with promotion motivation. The results indicated that greater ability to control one's own attention was correlated with decreased symptoms of depression, anxiety, and perceived stress, and increased experiences of total disruption. Increased

attentional control was also significantly related to promotion and prevention motivation. Symptoms of depression were significantly correlated with increased symptoms of anxiety, perceived stress, and a lower perception of total disruption. Symptoms of depression were also significantly negatively correlated with prevention and promotion, meaning as symptoms of depression increased individuals were less likely to use prevention or promotion motivation. According to other studies, the GAD7 and PHQ9, have been shown to be highly correlated with one another (Teymoori et al., 2020). Other researchers also found significant correlations between symptoms of depression and perceived stress when using the PHQ9 and PSS as reported by graduate level students (Liu et al., 2021). Reported symptoms of anxiety were significantly positively correlated with total disruption and symptoms of perceived stress. This indicates that those who reported more symptoms of anxiety also experienced more perceived stress, but lower levels of disruption. These results are consistent with researchers who found a correlation between anxiety and perceived stress during COVID-19 (Droit-Volet et al., 2020). Symptoms of anxiety were significantly negatively correlated with prevention, or those experiencing greater anxiety were less likely to demonstrate a promotion approach, and therefore less likely to work towards mastering content.

Total disruption was significantly positively correlated with perceived stress, indicating that as perceived stress increased, individuals also reported increased disruption. Total disruption was not significantly correlated with promotion motivation. Prevention was significantly positively correlated with promotion and negatively correlated with perceived stress. Therefore, as individuals worked to master content, they also worked to not fail and reported lower levels of perceived stress. This is consistent with research findings which indicate that promotion and prevention typically have an approximate .11 correlation with each other (Higgins et al., 2001).

Promotion is significantly negatively correlated with perceived stress, which was consistent with the above-mentioned hypothesis. As individuals work to not fail they report lower levels of perceived stress.

While there were no formal hypotheses for the supplemental analyses, there were differences in the outcome measures based on socio-economic status (SES) and student status, which was broken down into graduate and undergraduate students as well as international and domestic students. Research has shown that race and SES are related to each other and often impact one another closely (“Ethnic and racial minorities & socioeconomic status,” n.d.). When considering sustained attention, the current results indicated significant differences between individuals who reported earning less than \$50,000 per year compared to those who earned between \$50,000 and \$99,999, and also between the less than \$50,000 per year group and the group that earned over \$100,000. Therefore, those with lower income have greater difficulties sustaining attention. It is possible that this difficulty is due to the ways that individuals with higher incomes were able to allocate their resources to more easily meet needs that were impacted by COVID-19, therefore resulting in greater cognitive energy to sustain attention to a greater extent than those with lower income. Similarly, those earning between \$50,000 and \$99,999 reported significant differences in symptoms of anxiety when compared with those earning less than \$50,000: individuals who reported lower income experienced greater levels of anxiety. This is consistent with the hypothesis that lower levels of SES would experience greater anxiety. The data collected in this study demonstrated a significant difference between the lower- and middle-income groups across regulatory approaches, with lower income individuals demonstrating a slightly stronger prevention approach. That is they are more likely to be motivated to not fail than higher income groups. As discussed earlier, it is likely that lower SES

individuals had to shift priorities due to COVID-19 and may have had less financial support to address their needs and therefore aligned with prevention motivation, where they worked to avoid failure. Finally, graduate students demonstrated significantly higher levels of symptoms of anxiety. It is possible that individuals at the graduate school level experienced more job-related anxieties as many worked towards degrees with direct impact on employment. Domestic students aligned more strongly with promotion approach as compared to international students. Because of travel restrictions during COVID-19, international students may have shifted their academic motivation with less priority on mastering content, due to a need to focus on passing classes or not failing and a desire to address any travel concerns, including visa restrictions.

Limitations

There are many limitations evident in the current study. This was a correlational investigation and therefore any significance between or among variables cannot be determined to be causal. Additionally, while the study looked at the differences between non-Hispanic White students and Hispanic and non-White students, the differences among individuals in the Hispanic and non-White student group, which encompasses eight different racial groups, are unaccounted for. Due to the small sample size of each of these groups relative to the non-Hispanic White students, they could not be analyzed separately. More research is needed to account for these potential differences. While race is a social construct it is evident that due to discrimination and marginalization, as well as differences in education, medical care, and psychological care, racial and ethnically minoritized groups are impacted differently in society (“Ethnic and racial minorities & socioeconomic status,” n.d.).

Further, data was collected at a Predominantly White Institution (PWI), which impacts generalizability of the study to a non-PWI. Further, the data is not generalizable to an

international student population since 72% of the sample are domestic. Age was not collected as a demographic, and therefore it is unclear how representative the sample of this investigation is to undergraduate and graduate student populations at other colleges and universities.

Another limitation is that the survey was created by the investigator. From the time that the survey was created, to the time that data was collected, to the time of data analysis, both COVID-19 and individual experiences have changed. The survey was developed following the onset of COVID-19 beginning in the spring and summer of 2020. Items were created between July 2020 and April 2021, and the data were collected between June and August of 2022. Items were designed to measure experiences from the previous academic year (2021-2022). Since perceived stressors and the impact of disruption may have changed over the course of time, some items may not have been consistently relevant over the period of a year. Additionally, as COVID-19 ran its course and went through surges in infection rates, the survey, which was distributed in the summer, required individuals to reflect on the previous academic school year, which is significantly less reliable than reflection on the present. Further, the number of COVID-19 cases over the 2021-2022 academic year was inconsistent, with a spike in cases over the winter. This likely impacted individuals' responses to the survey items, as perceived stress may have fluctuated with infection rates.

In certain sections the survey used conditional logic or if-then items. This resulted in some intentional missing values, meaning that certain sub scales of disruption had fewer responses than other sub scales of disruption. However, some other missing values were due to disinterest in particular items or preference to not respond, though not limited to these issues. While individuals who completed the survey in a short amount of time (i.e., less than five minutes), were excluded, some individuals took breaks while completing the survey and

completed it in chunks. Further item analysis and qualitative data from participants would be needed to determine the reasoning behind skipped responses in order to inform future data collection on those constructs.

Additionally, survey items were developed based on different processes. Some survey items were based on COVID surveys created by other researchers, and other items were developed based upon themes identified from pilot data collected through focus groups with graduate students. Approximately $\frac{1}{3}$ of items were developed from themes identified in the focus groups, while $\frac{2}{3}$ of items were developed based on existing COVID-19 surveys. This process occurred over time, and items were adjusted to account for changes in COVID restrictions as well as the experiences of undergraduate and graduate students, but they may not have completely aligned with experiences of students when completing the items.

Feedback was received from some individuals taking the survey that it did not feel “brief,” despite being described as taking 20-30 minutes to complete. The length of the survey could have been a deterrent to some participants. Further, feedback was received that questions were written with the assumption that participants were not from the northeast, where the private institution is located. However, it is likely that many survey participants were from the northeast.

Future Directions

There are many ways in which this study can be improved in the future. First and foremost, it would be important to analyze the reliability and validity of disruption items in comparison to other data that has come out since the beginning of the COVID-19 pandemic. Further, individual items should be assessed for clarity and biases to ensure items are accessible and inclusive to all participants. It may be that other researchers completing work at the same time have not yet published but have found results that support or identify other ways to measure

disruption. If this survey or a similar survey is used again it would be important to add in a 'prefer not to answer' response selection to aid in data analysis. Additionally, because of the limited sample size it would be important to recruit larger sample of the non-White and Hispanic students.

Future research could explore other constructs related to perceived stress and online learning. The findings measuring perceived stress point to levels of greater environmental stress. Therefore, future research should address other sources of environmental stress in addition to perceived stress. Research on student engagement, particularly while participating in online or hybrid learning platforms could provide more insight into disruption. Measuring supportive factors which can be protective factors or resiliency factors, such as sense of belongingness, could explain differences in experiences when comparing by race. Additionally, due to the fact that individuals reported moderate levels of perceived stress it may be helpful to study the diagnosis of acute stress disorder or PTSD, particularly for those working in health care during the pandemic. The current study did not consider clinical mental health diagnoses, but the prevalence of these diagnoses may correlate with existing outcome measures. Other constructs that could provide value in understanding the impact of disruption are discrimination and marginalization. It would be helpful to include measures of systemic racism as it relates to perceived stress as a moderator, as this could explain differences between racial groups. This would provide further insight into the experiences of the non-White and Hispanic population of students given the coincidence with the resurgence of Black Lives Matter protests in 2020.

As COVID-19 continues to impact society and infection continues to spread, it would be worthwhile to collect longitudinal data. By doing so, researchers would be able to understand the long-term effects of perceived stress, and the impact on depression, anxiety, motivation, and

attention. A longitudinal study would allow researchers to collect data on the incidence of PTSD as it is diagnosed 6 months following a traumatic event. To bolster the strength of claims, additional data points are needed in order to determine change over time.

Given that the onset of COVID-19 was in March of 2020, future research should consider contextualization and wording of questions to collect data which is most relevant and recent. This current research was developed and collected over the course of multiple years and therefore question selection may not have been in alignment with experiences at the time of data collection, so future research should account for the changing nature of the pandemic to the extent possible.

Implications

It is evident that individuals identified and acknowledged experiencing stress during the second year of the pandemic when various activities returned to in person or operated in a hybrid setup. The moderate levels of perceived stress that were reported by all racial groups indicate a need for interventions at the secondary education level targeting student stress. During the pandemic many schools made emergency funds and other resources available to students to ensure that basic needs were met. These resources should be continued since the effects of the pandemic continue. Additionally, interventions such as mindfulness, relaxation, and executive functioning strategies, such as support with organization and time management should be offered at a college wide or university wide level. This would allow for tiered systems of support in a setting where students at a baseline, are stressed, and experience anxiety and depression. Providing a low level of support student-wide can serve as a preventative intervention that would hopefully decrease the number of students that experience higher levels of stress or greater symptoms of anxiety or depression. Students can also take advantage of campus counseling

services to help manage concerns related to school that are exacerbated by perceived stress in the pandemic. If students continue to experience distress beyond what is addressed through college wide support, such as that listed above, classroom-based interventions may be necessary to address stress. This may look like increased accommodations for students or flexibility in assignment timelines.

Implications are limited due to the design of the perceived stress measures (past month), and the depression and anxiety screeners both designed to keep the past two weeks in mind. Therefore, the current study measured ‘the past month or two weeks,’ likely reflective of a typical multi-week period two years into the pandemic for individual participants, rather than a measure of acute stressors. While students were asked to consider the previous academic year for items measuring disruption, the significant levels of variation in disruption make it more difficult to provide one rating or a general assessment of the entire year. Similarly, the impacts of loss at the beginning of the pandemic may not have been the same as immediately following a loss, and therefore have differing effects on depression, anxiety, motivation, or attention. Overall, different measures asked respondents to reflect on different time spans which may have introduced variation in their responses.

Finally, the significant differences in perceived disruption between non-Hispanic White students and non-White and Hispanic students has limited implications, both as it relates to the sample mismatch in representation of the study population, undergraduate and graduate students at a private institution, and the ever-changing nature of COVID-19. Since the frame of reference for data collection was the 2021-22 school year, students may have rated their disruption at that time, which may not be consistent with their experiences when completing the survey. This is likely due to the fact that COVID-19 precautions and modifications have changed significantly.

Many individuals may feel that things have “returned to normal.” Regardless, the data indicates that secondary education institutions should continue to gather data related to academic, living, COVID, and lifestyle disruptions to determine the extent to which these categories of disruption continue to impact their students. Interventions related to addressing disruption could include student body surveys each semester and continued access to COVID-19 era resources, such as testing, protective measures, financial support, and other resources that target academic, living, COVID and lifestyle disruptions based on the results of ongoing surveys.

Conclusion

The purpose of this study was to evaluate the impact of perceived stress and disruption caused by COVID-19 and their role as moderators of the relationship between racial groups. Specifically, this investigation measured differences between non-Hispanic White and non-White and Hispanic graduate and undergraduate students, on measures of sustained attention, motivation and symptoms of depression and anxiety. Results demonstrated that during the second academic year of the pandemic all racial groups reported moderate levels of perceived stress. Non-Hispanic White students reported more sources of disruption than non-White and Hispanic students. However, when rating the extent of disruption, non-White and Hispanic students reported greater levels of disruption. All participants reported greater levels of perceived stress, which indicated they also reported higher levels of symptoms of depression and anxiety, greater difficulty sustaining attention and a stronger likelihood of using both prevention and promotion approaches. Those with lower economic circumstances reported higher levels of anxiety, greater difficulties sustaining attention, and were more likely to be motivated to not fail. Graduate students demonstrated significantly higher symptoms of anxiety than undergraduates and international students were more likely to be motivated to not fail than domestic students. In

general, some data from the current study aligned with some current research on COVID-19, while other data was inconsistent with existing data.

Given that COVID-19 is a relatively new area of research, continued research is needed to further determine generalizability, validity, and reliability of the current study. The current study indicates a need for further research on the longstanding impacts of the COVID-19 pandemic on undergraduate and graduate students, and particularly more information on racially and ethnically minoritized students. Data of this sort can be used to inform interventions designed to address students perceived and actual stress and the ongoing impacts of COVID-19. Secondary education institutions should focus attention on increasing their understanding of current concerns that cause students stress and disruption in order to provide greater support.

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Appendix A

Focus Group Questions

- 1.) What major differences have you felt from classroom learning to online or distance learning?
 - a. Academically
 - b. Emotionally
- 2.) What are some of the biggest lifestyle changes you have made during the time of COVID?
 - a. What are some of the influences for these changes?
- 3.) How have your own day-to-day routines changed or stayed the same?
- 4.) How have expectations for yourself and your future changed?
 - a. Expectations about performance in school?
 - b. Expectations about hireability? Expectations about training?
- 5.) What are your experiences with handling crisis and school responsibilities pre-COVID, if any?
- 6.) Where do you find your motivation to do school, pre-Covid & post-Covid?
- 7.) Any related comments about your experiences? Things you have not already shared you feel it would be important to share?

Note. Demographics were not collected. 10 students in the first year of a psychology master's program, 4 students in the second year and 5 students in the third year. 1 in first year, 3 in second year, 1 in third year of a psychology PhD program.

Appendix B

Perceived Stress in the Context of a Pandemic Survey

Start of Block: Student Status

Q1 Are you an undergraduate or graduate student?

Graduate

Undergraduate

Q2 What year are you in your program?

▼ 1st Year ... 7th + Year

Q3 What is the culminating degree of your program?

▼ BS ... PhD

End of Block: Student Status

Start of Block: Changes to Your Program

Q4 As a result of COVID-19, **have you considered** taking fewer courses per semester, a leave of absence, completing an applied placement outside of New York or elsewhere closer to home, or transferring to a program somewhere closer to home?

Yes

No

Display This Question:

If As a result of COVID-19, have you considered taking fewer courses per semester, a leave of absenc... = Yes

Q5 As a result of COVID-19, **have you experienced a change** in the expected trajectory of your program, such as taking fewer courses per semester, a leave of absence, completing an applied placement outside of New York or elsewhere closer to home, or transferring to a program somewhere closer to home?

Yes

No

Q6 Has COVID-19 altered the next steps required for your program or employment (i.e., to complete required degree hours, ability to secure job placement, completion of certification requirements)?

Yes

No

End of Block: Changes to Your Program

Start of Block: Changes in Lifestyle/Routine

Q7 Since the pandemic started in March of 2020 through your last completed academic semester (Fall of 2021), how has your program altered instruction and applied placements (i.e., practica, fieldwork, student teaching, internships, and externships)? Select the **one option** which best describes learning shifts.

All educational experiences (i.e., classes, placements) remote/online

Most educational experiences (i.e., classes, placements) remote/online; one class/meeting in person

Some educational experiences (i.e., classes, placements) remote/online; two or more classes/meetings in person

All educational experiences (i.e., classes, placements) in person

A combination of two or more of the above options

Q8 Since the onset of COVID-19, do you feel **your college or university** has provided adequate support in the following areas?

	Extremely inadequate	Somewhat inadequate	Neither adequate nor inadequate	Somewhat adequate	Extremely adequate
Educational	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emotional	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Financial	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Racial	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cultural	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q9 Since the onset of COVID-19, do you feel **your program/department** has been providing adequate support in the following areas?

	Extremely inadequate	Somewhat inadequate	Neither adequate nor inadequate	Somewhat adequate	Extremely adequate
Educational	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emotional	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Financial	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Racial	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cultural	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

End of Block: Changes in Lifestyle/Routine

Start of Block: Online Learning

Q10 How satisfied are you with your online learning experience over the course of the pandemic?

- Very dissatisfied
 - Dissatisfied
 - Neither satisfied nor dissatisfied
 - Satisfied
 - Very satisfied
-

Q11 Over the course of the pandemic how difficult has it been to maintain internet connectivity for online coursework?

- 1 - Extremely difficult
 - 2
 - 3
 - 4
 - 5 - Not at all difficult
-

Q12 Over the course of the pandemic how difficult has it been to keep a regular schedule for academic work?

- 1 - Extremely difficult
 - 2
 - 3
 - 4
 - 5 - Not at all difficult
-

Q13 Over the course of the pandemic how difficult has it been to maintain a physical workspace for academic work?

- 1 - Extremely difficult
 - 2
 - 3
 - 4
 - 5 - Not at all difficult
-

Q14 Over the course of the pandemic how difficult has it been to have a lack of access to resources/tools on campus?

- 1 - Extremely difficult
 - 2
 - 3
 - 4
 - 5 - Not at all difficult
-

Q15 Over the course of the pandemic how difficult has it been to manage distractions while pursuing academic goals?

- 1 - Extremely difficult
 - 2
 - 3
 - 4
 - 5 - Not at all difficult
-

Q16 Over the course of the pandemic how difficult has it been to live outside of usual arrangements while pursuing academic goals?

- 1 - Extremely difficult
 - 2
 - 3
 - 4
 - 5 - Not at all difficult
 - N/A
-

Q17 Over the course of the pandemic how difficult has a lack of interactions with peers been while pursuing academic goals?

- 1 - Extremely difficult
 - 2
 - 3
 - 4
 - 5 - Not at all difficult
-

Q18 Have you had a dedicated workspace for schoolwork in your home during COVID?

- Yes
 - No
-

Q19 Have you had a healthy work/life balance with online learning during COVID?

- Yes
 - No
-

Q20 When attending remote classes and completing online course work, how productive do you feel compared to in-person classes?

- Much less productive
 - Slightly less productive
 - Neither more nor less productive
 - Slightly more productive
 - Much more productive
-

Q21 When attending remote classes and completing online course work, what level of effort do you find yourself putting forth compared to in person classes?

- Much less effort
 - Slightly less effort
 - Neither more nor less effort
 - Slightly more effort
 - Much more effort
-

Q22 Considering the impacts of COVID-19, how flexible do you feel your professors have been when it comes to assignment deadlines and assignment requirements (i.e., number of pages, number of citations, level of depth, etc.)?

- Extremely inflexible
 - Somewhat inflexible
 - Neither flexible nor inflexible
 - Somewhat flexible
 - Extremely flexible
-

Q23 Considering the impacts of COVID-19, how comfortable do you feel when it comes to asking your professors for an extension/modification on an assignment?

- Extremely uncomfortable
 - Somewhat uncomfortable
 - Neither comfortable nor uncomfortable
 - Somewhat comfortable
 - Extremely comfortable
-

Q24 Considering the impacts of COVID-19, how would you say the quality of your work has changed compared to pre-COVID-19?

- Greatly worsened
 - Slightly worsened
 - Remained the same
 - Slightly improved
 - Greatly improved
-

Q25 Compared to in person classes, how much time do you spend preparing for classes when completing online courses (i.e., completing assigned readings, gathering needed materials, etc.)?

- Much less time
- Slightly less time
- Neither more nor less time
- Slightly more time
- Much more time

End of Block: Online Learning

Start of Block: Employment

Q26 Have you held a job while also completing coursework during the pandemic?

- Yes
 - No
-

Display This Question:

If Have you held a job while also completing coursework during the pandemic? = Yes

Q27 In what capacity do you work?

- Work-study or other employment within the university
 - Part-time or freelance employment outside of the university
 - Full-time employment outside of the university
-

Display This Question:

If Have you held a job while also completing coursework during the pandemic? = Yes

Q28 How has COVID-19 affected your working situation? Select the **one option** which best describes the effect of COVID.

- Furloughed
 - Out of work - Terminated
 - Out of work - Quit
 - Working from home
 - Working remote/online
 - Working hybrid (i.e., alternating between office space and home)
 - Loss of hours
 - Decrease in pay rate
 - No change
-

Display This Question:

If Have you held a job while also completing coursework during the pandemic? = Yes

Q29 Is your work considered essential during the COVID-19 pandemic?

- Yes
- No

End of Block: Employment

Start of Block: Working From Home or Remote/Online

Display This Question:

If How has COVID-19 affected your working situation? Select the one option which best describes the... = Working remote/online

Or How has COVID-19 affected your working situation? Select the one option which best describes the... = Working hybrid (i.e., alternating between office space and home)

Or How has COVID-19 affected your working situation? Select the one option which best describes the... = Working from home

Q30 How satisfied are you with working from home during the COVID pandemic?

- Very dissatisfied
 - Somewhat dissatisfied
 - Neither satisfied nor dissatisfied
 - Somewhat satisfied
 - Very satisfied
-

Q31 What is the biggest challenge you have faced while working from home?

- Internet Connectivity
 - Keeping a regular schedule
 - Physical workspace
 - Lack of access to resources/tools in the office/place of employment
 - Distractions
 - Living outside of usual arrangement
 - Lack of interaction with peers
 - Other
-

Display This Question:

If How has COVID-19 affected your working situation? Select the one option which best describes the... = Working from home

Or How has COVID-19 affected your working situation? Select the one option which best describes the... = Working remote/online

Or How has COVID-19 affected your working situation? Select the one option which best describes the... = Working hybrid (i.e., alternating between office space and home)

Q32 Have you worked from home or remotely/online before?

- Yes
- No

End of Block: Working From Home or Remote/Online

Start of Block: Living Situation

Q33 Where were you living **before** the onset of COVID-19?

- On campus
 - Off campus
-

Q34 Following the onset of COVID-19, were you forced to move from your original living environment?

- Yes
 - No
-

Display This Question:

If Following the onset of COVID-19, were you forced to move from your original living environment? = Yes

Q35 Where did you move?

- To a living environment alone
 - To a living environment with family/extended family members
 - To a living environment with friends
-

Q36 Between Spring 2020 through Fall 2021, did you live far away **from close family members**?

- Yes
 - No
-

Q37 Between Spring 2020 through Fall 2021, did you live far away **from your academic institution**?

Yes

No

Display This Question:

If Where did you move? = To a living environment with family/extended family members

Or Where did you move? = To a living environment with friends

Q38 Compared to **before** the COVID-19 pandemic, were/are there more conflicts in your household about:

	Much less than before	A little less than before	The same as before	A little more than before	Much more than before
How to spend leisure time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Schoolwork	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decisions about how people should take care of their health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decisions about going out	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Home maintenance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Personal hygiene	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Food	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Work or school (i.e., needing a quiet space at home)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Privacy or personal space	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
News or social media	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Politics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Display This Question:

If Where did you move? = To a living environment with family/extended family members

Q39 Were there activities with family you became involved in that you weren't before?

	Yes	No
Completing errands for other family members	<input type="radio"/>	<input type="radio"/>
Spending leisure time with family members	<input type="radio"/>	<input type="radio"/>
Doing exercise or fitness activities	<input type="radio"/>	<input type="radio"/>
Facing challenges or solving problems	<input type="radio"/>	<input type="radio"/>
Helping others	<input type="radio"/>	<input type="radio"/>
Sharing household tasks	<input type="radio"/>	<input type="radio"/>
Eating together	<input type="radio"/>	<input type="radio"/>

End of Block: Living Situation

Start of Block: COVID-19

Q40 Do you have risk factors that place you at high risk for contracting COVID-19?

Yes

No

Q41 Does anyone you live with have risk factors that place them at high risk for contracting COVID-19?

Yes

No

Q42 Have you contracted COVID-19?

Yes

No

Display This Question:

If Have you contracted COVID-19? = Yes

Q43 Did you contract COVID-19 more than once?

Yes

No

Display This Question:

If Have you contracted COVID-19? = Yes

Q44 Rate your symptoms of COVID-19 (1st/Only time contracted)

Severe - Symptoms severe and required ventilation

Moderate - Symptoms severe ad required brief hospitalization

Mild - Symptoms effectively managed at home

None

Display This Question:

If Did you contract COVID-19 more than once? = Yes

Q45 Rate your symptoms of COVID-19 subsequent to the first time you contracted COVID-19

- Severe - Symptoms severe and required ventilation
 - Moderate - Symptoms severe and required brief hospitalization
 - Mild - Symptoms effectively managed at home
 - None
-

Q46 Has anyone in your family (in or outside of your home) contracted COVID-19?

- Yes
 - No
-

Display This Question:

If Has anyone in your family (in or outside of your home) contracted COVID-19? = Yes

Q47 Did they require hospitalization?

- Yes
 - No
-

Q48 Has anyone in your family (in or outside of your home) died from COVID-19 related complications?

- Yes
 - No
-

Q49 Are you providing homecare (caretaking of the elderly, those with disabilities, etc.) due to COVID-19?

Yes

No

Q50 During the COVID-19 pandemic, are/were you or anyone in your home working in healthcare with direct patient contact?

Yes

No

Q51 During the COVID-19 pandemic, was anyone in your home working in a job that you considered to be high risk for contracting COVID-19?

Yes

No

Q52 Compared to **before** the onset of COVID-19, how often have you consumed news to gain information?

A great deal less

Somewhat less

About the same

Somewhat more

A great deal more

Q53 At the onset of COVID in March 2020, what was the most restrictive state government-imposed requirements or COVID restrictions that affected you and your movement in and out of the home?

- There are/were no requirements that affect my movement; I am free to come and go as usual
 - Our government has/had some guidelines, but no formal requirements
 - We are/were required to practice social distancing when in public
 - We are/were required to stay home but can leave the house to meet basic needs
 - We are/were required to wear masks when social distancing is not possible
 - We are/were required to wear masks at all times in public
 - We must request permission from the government to leave home
 - Only one family member may leave the home each day
 - Other
-

Q54 Rate how much the COVID-19 pandemic has changed your life in each of the following ways:

	A great deal of change	A lot of change	A moderate amount of change	A little change	No change
Routines	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Family income/employment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Food access	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Access to extended family and non- family social supports	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q55 On a scale of 1 to 5, where 1 means "has had a major impact on me" and 5 means "has not impacted me at all", rate the impact of COVID-19 on **your personal life** with regard to:

	1 - Has had a major impact on me	2	3	4	5 - Has not impacted me at all
Work/school participation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Economic situation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Medical health care access	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mental health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mental health treatment access	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eating habits	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q56 On a scale of 1 to 5, where 1 means "has had a major impact on me" and 5 means "has not impacted me at all", rate the impact of COVID-19 on **your family** with regard to:

	1 - Has had a major impact on me	2	3	4	5 - Has not impacted me at all
Work/school participation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Economic situation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Medical health care access	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mental health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mental health treatment access	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eating habits	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q57 Have you changed your eating habits during the COVID-19 pandemic (i.e., started a diet, restricted certain foods, altered based on what was available in grocery stores)?

Yes

No

Q58 Compared to before the onset of COVID-19, how much sleep are you currently getting during the COVID-19 pandemic?

- A great deal less
 - Somewhat less
 - About the same
 - Somewhat more
 - A great deal more
-

Q59 Compared to before the onset of the COVID-19 pandemic, how often are you currently getting regular exercise during the COVID-19 pandemic?

- A great deal less
 - Somewhat less
 - About the same
 - Somewhat more
 - A great deal more
-

Q60 Compared to before the onset of the COVID-19 pandemic, how often are you currently using meditation during the COVID-19 pandemic?

- A great deal less
 - Somewhat less
 - About the same
 - Somewhat more
 - A great deal more
-

Q61 Compared to before the onset of the COVID-19 pandemic, how often are you currently connecting with family/friends via telecommunication during the COVID-19 pandemic?

- A great deal less
 - Somewhat less
 - About the same
 - Somewhat more
 - A great deal more
-

Q62 Have you felt physical pain a lot of the time during the COVID-19 pandemic?

- Yes
 - No
-

Q63 Have you felt worried a lot of the time during the COVID-19 pandemic?

Yes

No

Q64 Have you felt sad a lot of the time during the COVID-19 pandemic?

Yes

No

Q65 Have you felt angry a lot of the time during the COVID-19 pandemic?

Yes

No

Q66 Have you felt stressed a lot of the time during the COVID-19 pandemic?

Yes

No

Q67 Have you felt tired a lot of the time during the COVID-19 pandemic?

Yes

No

End of Block: COVID-19

Start of Block: Racial Justice Movement

Q68 During the COVID-19 pandemic, individuals have been experiencing exacerbated stress related to concern surrounding racial and social injustices. Multiple Black Americans were killed by police officers, following which occurred the resurgence of the Black Lives Matter movement during a time when individuals were spending most of their time at home and feeling concerned about health as it related to the pandemic. To what extent do you perceive racial and social injustice to exacerbate stress you have felt in the academic setting during the pandemic?

- Not at all influential
- Slightly influential
- Somewhat influential
- Very influential
- Extremely influential

Q69 The following questions regard social support in racial situations.

End of Block: Racial Justice Movement

End of original survey items

Start of Block: GAD-7 (Spitzer et al., 2006)

End of Block: GAD-7

Start of Block: PHQ-9 (Kroenke & Spitzer, 2002)

End of Block: PHQ-9

Start of Block: RFQ (Higgins et al., 2001)

End of Block: RFQ

Start of Block: Perceived Stress Scale (Cohen et al., 1983)

End of Block: Perceived Stress Scale

Start of Block: Attentional Control Scale (Quigley et al., 2017)

End of Block: Attentional Control Scale

Start of Block: Demographics

Q86 Which category best describes you?

- American Indian or Alaska Native
 - Asian
 - Black or African American
 - Hispanic, Latinx, or Spanish Origin
 - Middle Eastern or North African
 - Native Hawaiian or Pacific Islander
 - White
 - Multiple
 - Some other race, ethnicity, or origin _____
 - Unknown
 - I prefer not to answer
-

Q87 What is your current gender identity?

- Woman
 - Man
 - Transgender
 - Non-binary/Non-conforming
 - I prefer not to answer
-

Q88 Which of the following best describes your personal income last year (i.e., 2021)?

- \$0
 - \$1 to 9,999
 - \$10,000 to 24,999
 - \$25,000 to 49,999
 - \$50,000 to 74,999
 - \$75,000 to 99,999
 - \$100,000 to 149,999
 - \$150,000 or more
 - I prefer not to answer
-

Q89 What is the highest level of education your mother reached?

- Did not finish high school
 - Graduated from high school or equivalent (GED)
 - Graduated from high school and attended a two-year school (i.e., vocational or technical school, junior college, community college), but did not complete a degree
 - Graduated from a two-year school (i.e., vocational or technical school, junior college, community college)
 - Graduated from high school and went to college, but did not complete a four-year degree
 - Graduated from college
 - Completed a Master's degree or equivalent
 - Completed a Ph.D., M.D., or other advanced professional degree
 - Don't know
-

Q90 Are you an international student?

- Yes
- No

End of Block: Demographics
