RETENTION AND PERFORMANCE DURING COVID-19: PROSOCIALITY PERCEPTION, SOCIAL ISOLATION, AND ONLINE ENGAGEMENT

By

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Abstract

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The experiences of university students impacted by COVID-19 and circumstances surrounding their experiences, help inform the future of higher education in the United States. In the uncertain and rapidly evolving higher education system, understanding retention patterns of students has become increasingly complex. This study examined how self-perceived prosociality and self-perceived social isolation among university students in an online education environment relate to the intention to re-enroll in university and their academic achievement (Grade Point Average; GPA). Ninety-seven university and community college students completed an online survey. Based on previous literature, we expected women to report higher prosociality perceptions than men (e.g., Mavroveli & Sánchez-Ruiz, 2011; Ruckmani & Balachandra, 2015). We also expected online engagement to mediate the relationships between prosociality perceptions and GPA and retention intention, and between social isolation and GPA and retention intention, respectively. Except for the gender differences hypothesis, all other study hypotheses were not supported. Areas for future research include additional changes in higher education and student stressors. This study adds to the literature bridging educational and psychological research and highlights areas of potential growth for college students' academic performance.

Keywords: University students, retention, academic performance, prosociality, social isolation, online-learning, COVID-19

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Introduction

Student retention has been a persistent issue for universities for decades (Lee & Choi, 2011; Tinto, 1993). Retention refers to student enrollment patterns: either students are retained to the next academic semester or year, or they are not retained. Retaining students is usually a good sign for schools as their enrollment is healthy and they are not losing students. Retention is important not only for institutional revenue but for keeping school-provided services available to meet the needs of diverse students and the communities they serve. Capturing accurate patterns of retention is a continued difficultly as students leave school for many reasons, such as personal or environmental changes, and sometimes reenroll in other institutions. Failing to retain students may be in the best interest of the student, but the outcome hurts educational institutions. As Tinto's (1975) foundational retention theory described, gaps in retention research lead to misleading and/or contradicting findings. To add to the complexity of capturing and analyzing retention patterns, the ongoing health crisis and circumstances of the novel coronavirus or COVID-19 pandemic have negatively impacted some students more than others by increasing financial stress, housing insecurity, heightened health safety concerns, employment scarcity, and many more. During the pandemic, many educational institutions transitioned to online platforms to slow the spread of COVID-19 (e.g., Zoom, Google Meet, Microsoft Teams; Kelderman, 2020) which affected students and, faculty, and institutions.

The educational transition to online platforms for universities and students due to COVID-19 was tumultuous; positive and negative aftereffects will persist for years to come. Most higher education institutions adjusted to remote settings, such as hosting solely online classes when the university otherwise would have hosted instruction in-person. Many college campuses experienced and continue to experience difficulty when transitioning during the pandemic. Technology mitigation became necessary as students, faculty, and staff had differing access to the internet, computers, webcams, and more. Many institutions made rapid changes implementing viable online platforms for remote instruction, accreditation changes, equipment rentals for students/staff, and technology training for faculty in mere months from the first exposure to nation-wide quarantine periods (Armstrong-Mensah et al., 2020). The response to the pandemic varied both locally and nationally. Inconsistencies were observed state-by-state and county-by-county (e.g., Tolbert et al., 2022). This caused confusion among the masses as fear and stress grew with daily updates and contradicting policy mandates. For many, life was significantly altered such that students and their families experienced record-breaking unemployment rates, housing insecurity, over-extended hospitals, dwindling medical supplies, a staggering death toll, national/local political strife, as well as many other systemic issues which became apparent as dire conditions progressed (Pillay & Barnes, 2020). Many schools and students continue to carve out new normal procedures to accommodate for COVID-19, though the impacts persist beyond the control of institutional reach.

Normative protocols for school, work, and social gatherings evolve rapidly to meet government standards of safety, often resulting in mandated social isolation when actively contagious or in proximity with potential contagion. Social distancing and limited group congregation mandates were implemented by local government to slow the spread early on but were lifted in many areas as vaccination became widely available. Policy mandates are overseen by local government agencies, but many individuals choose not to adhere to policies involving face coverings, masks, isolation/quarantine, and other recommended health and safety protocols for varied reasons, making measures of pandemic-response incredibly uncertain. Encouraging isolation when possible is necessary for safety with the fast-acting COVID-19 virus and persists as a national recommendation from the Center for Disease Control (e.g., CDC, 2022) regardless of local policy. While these measures have positive intent, we must question how this isolation, rapid government change, personal choice, and massive structural uncertainty impacted students in higher education.

Literature Review

Examining university student populations is imperative as the potential struggles and stress of COVID-19 compound. Students attending university during a quarantine period for COVID-19 reported high rates of psychiatric symptomology such as depression (46.55%), anxiety (34.73%), and traumatic stress (67.05%; Sun et al., 2021). Mental health symptoms as mentioned above, are associated with downward grade trends and higher dropout rates (Bruffaerts et al., 2018). In addition, COVID-19 adjustments impact students' college transition and potential community incorporation as many

environments are being offered online rather than in-person. Interaction alterations in student environments (both personal and academic) impact students' ability to transition and engage in community connection which affect persistence (Tinto, 1975). As COVID-19 adjustments continue, Tinto's retention theory highlights key areas to consider. Among Tinto's main points of consideration, this study focused on institutional experience, academic systems, and integration. Institutional experience and academic systems include student-faculty relationships, academic performance, extracurricular activities, and peer-peer interactions; integration focuses on academic and social aspects of student assimilation into classroom and campus cultures (e.g., Aljohani, 2016). Borrowing from Tinto's theoretical foundation (i.e., institutional experience, academic systems, and integration), the current study investigated college students' academic performance and retention during the COVID-19 pandemic with a special focus on online learning environments.

Academic performance is measured using several different indicators such as students' GPA, retention, and graduation rates (Uppal et al., 2018). For this study, we used a measure of grades (GPA) to measure academic performance. Salimi et al. (2021) found that COVID-19 negatively predicted students' university attendance and college performance (i.e., downward trending GPA). In addition to negative grade trends, the pandemic has impacted retention resulting in students taking time off from school or gap years and opting for community college over universities (Ansari, 2020; Mohammadian et al., 2021; Rapacon, 2020). To further explore these relationships, the current study investigated how college students' prosociality perception and social isolation relate to

their academic performance and retention during the COVID-19 pandemic. It is likely that during a time of increased uncertainty, factors like prosociality and social isolation have a larger impact on students' academic performance and retention than pre-pandemic.

Prosociality Perceptions in the University Environment

Prosociality is voluntary acts or actions of an individual resulting in benefit to another (Taylor & Carlo, 2021). One's perception of prosociality is their ability to relate and identify with prosocial traits such as helping, volunteering, and/or empathizing with others. Notably, gender differences exist in prosociality and may vary by culture. It is important to note that research in this area is limited to the gender binary and reports findings about women and men. Women commonly score higher on traits associated with prosociality (i.e., empathizing and interpreting emotions) than men (Mavroveli & Sánchez-Ruiz, 2011; Ruckmani & Balachandra, 2015). As prosociality showcases behaviors which benefit others, they are critical to development, group dynamics, individual differences, well-being, and interpersonal relationships (Van Tongeren et al., 2016). Overall, prosociality is beneficial to one's well-being and often can result in greater life satisfaction long-term (Oarga & Fetchenhauer, 2015).

In the educational domain, prosociality promotes academic performance and student transition which is critical to degree completion (Caprara et al., 2005). Understanding how students' prosociality perceptions impact their academic performance helps us accurately capture retention patterns (Tinto, 1975). Students on the receiving end of prosociality, and students who reciprocate such acts, contribute positively to the

collective school environment (Brandenberger & Bowman, 2015). As these factors intertwine, a picture of the university-student relationship begins to emerge. School systems focusing on establishing nurturing environments via the promotion of prosociality see a positive impact in the student-institution relationship overall (Barr & Higgins-D'Alessandro, 2009). Furthermore, encouragement of prosociality-based activities and behavior aligns with many university's mission statements. Institutions are invested in building community and a sense of belonging which help reduce dropout rates and declines in academic performance.

Practical applications of prosociality vary by school, though there are some common approaches that colleges utilize to provide opportunities to encourage students' prosociality. Common prosociality activities fostered by universities include volunteering, club engagement, peer mentoring, cultural exchanges, and more. During these activities a sense of community is created among students via organic, voluntary events (e.g., athletic events, clubs, engagement fairs, etc.). Other events, such as classroom interactions (e.g., class projects, fieldtrips, discussion boards, etc.), are less transparent but still provide opportunities for prosociality. Given the challenges of transitions, opportunities for prosociality are especially important for first-time freshman, transfer students, and returning students (Shim & Ryan, 2012). Prosociality is complexly woven into school culture as well as peer-to-peer and student-to-faculty interactions.

Faculty play an important role in student experience, academic performance, and informal academic systems (Detres et al., 2020; Kane et al., 2008; Tinto, 1975; Woodside et al., 1999). Moreover, faculty are important gatekeepers to prosociality opportunities in

the college environment. Faculty influence class structures and general student interactions, though the level of influence will depend on the faculty. High-impact practices promoting prosociality include teaching strategies such as reflection (e.g., intentional emphatic review and understanding based on previous learning), engagement (e.g., facilitating student-student interactions), critical thinking (e.g., theoretically/practically synthesizing multiple concepts), and learning through diverse perspectives (e.g., pivoting differing cultural/identity vantages; Kanuka & Jugdev, 2006). Some faculty even model implicit prosocial-based communication tactics and look for similar cues in their students (Finn, 2012).

Opportunities for prosociality engagement in the classroom also vary depending on modality. In-person classrooms offer real-time collaborative group activities, whereas online classrooms may offer asynchronous discussion boards, comparatively. Prosociality modeling is effective for interactions in-person and when using asynchronous audio/visual materials (Jung et al., 2020). Individual expectations and experiences create a complex foundation for prosociality interactions, especially in the online environment. To showcase the experiential difference, in-person classrooms may offer the opportunity for a student to visually recognize needs of a peer and volunteer assistance such as offering notes to a student that has an injured hand. In the online environment, although the need for assistance exists, it may not be as apparent. Expectations also vary between the two environments; online classes allow more opportunity for environmental distractions than the traditional classroom. Despite challenges, it is still possible to foster prosociality in online environments. Erreygers et al. (2017) found that online

environments incite prosociality in students rather than antisocial behaviors: students reported feeling more positive emotions after interacting with their peers online. Even more, Duke et al. (2015) found students engaged in online-learning were able to preserve prosociality connections by sharing personal stories and utilizing reflective practices more effectively later in the academic year compared to the start of the academic year.

Offering prosociality opportunities in the classroom can assist the quality of peer-to-peer interaction for students, though faculty must facilitate these interactions with care by utilizing the prosociality-inducing teaching strategies discussed above. In a meta-analytic review on prosociality by Jung et al. (2020), across 88 studies with over 25,000 participants, prosociality had a significant positive relationship with helping behavior. Individuals impacted by prosociality showed a contagious effect, though a mirroring effect could be true of negative social behaviors as well (Jung et al., 2020). Peers do not always influence students' prosociality in positive ways. An act of prosociality performed for public good that results in negative consequences can impact a student's likelihood to perform the same good deed again (Delk, 2013). An example of prosociality backfiring is whistleblowing. Whistleblowing is meant to offer benefit to others, but if the individual acting prosocially by whistleblowing is then ostracized, it can have the opposite contagious impact (Delk, 2013). More commonly, prosociality energizes and enhances individuals' well-being in the absence of the benefitting party. This means the experience of positive gain from prosociality toward others exists, regardless of observed impact (Martela & Ryan, 2016). While acts of prosociality largely bring positive long-term benefits, gaps exist when examining impact in our new or understudied environments,

such as due to the COVID-19 pandemic. Online learning in this environment has been perceived by some students as isolating and disengaging.

Social Isolation in the University Environment

Social isolation is lacking consistent social interaction and/or social contact with others. Individual perceptions of social isolation vary. A closely related construct is loneliness, described as one's perception of social needs not being met, causing distress to the individual. Though social isolation symptomology has been associated with loneliness, there can be slight nuance. For the purposes of this study, social isolation and loneliness will be used and measured synonymously. Although in terms of the COVID-19 pandemic, isolation is a positive health protective measure for exposure/spread, outside of this context it is linked to negative health and other outcomes. Young adults experiencing social isolation show higher risk for adverse mental health symptoms, especially during the pandemic (Okruszek et al., 2020; Pai & Vella, 2021). Social isolation has been associated with heightened likelihood of depression (Petersen et al., 2016) and higher rates of anxiety and boredom (Russell et al., 1978).

It is important to note that while some students are struggling, others are thriving in the online environment as it has provided flexibility of schedule and physical location which varies by student preference (Terenko & Ogienko, 2020). However, overall the combination of involuntary of online classes and social isolation during the pandemic may result in further detriments and add to the growing mental health crisis of students in the United States higher education system (Dennon, 2020). During traditional holiday breaks from school, students suffer sleep inconsistencies, engage in less physical activity,

spend more time on screens, and have less healthy eating habits than when during regular attendance (Wang et al., 2020). Similar to student behavior on holiday breaks, these negative consequences are appearing in college populations impacted by COVID-19. Also telling, there is an uptick in the utilization of counseling services on campuses (Dennon, 2020).

In two separate studies, social isolation negatively impacted students' overall academic involvement (Limon-Vazquez et al., 2020) and their academic performance during COVID-19 (Naqshbandi et al., 2017). Within the classroom, online classes that are more isolating (i.e., without peer-peer interaction) result in lower academic performance (Croft et al., 2010). Interactions in the online classrooms such as recorded lectures compared to real-time lectures may also contribute to students' feelings of social isolation (e.g., Forbes et al., 2019). Consideration of ecological impacts aligns well with Tinto's theory of student retention as it covers a broad swath of interactions and relationships. For example, a student experiencing social isolation may struggle outside of the classroom because of stigma associated with mental health in the United States (Rapee et al., 2011). According to Tinto (1975) a careful balance of social and academic engagement is necessary for retention and student success. Therefore, examining students' perceptions of social isolation alongside perceptions of prosociality is critical given the complexities of online learning during the COVID-19 pandemic.

Online Engagement in the University Environment

Online engagement is defined as the time, dedication, and attention a student may invest to online classes and the online learning environment which can be measured via

completion of assignments, participation, academic performance, and more. Multifaceted engagement is important for success in key areas such as academic performance and student retention (Tinto, 1975). Although, each student's ability to engage online depends on variable factors. For students who chose to continue their education during the pandemic, the compulsory online environment allows researchers to explore the experiences of students who may have otherwise chosen traditional, in-person learning. As technology continues to evolve, access to online resources is widely available and institutions now offer online-specific programs. These online-specific programs serve populations of students choosing to pursue their educational courses solely via online modalities. Although universities have utilized online components in their curriculum for decades the emergency online setting, resulting from the COVID-19 pandemic, may not be comparable to pre-pandemic online learning environments (e.g., Cochran et al., 2014).

With advanced technology, however, current online-learning environments can mimic, to an extent, crucial in-person instruction and peer comradery tactics in a safe environment. Online platforms are built to engage students through multiple approaches such as: integrative video chats, synchronous and asynchronous class sessions, real-time discussion opportunities, and fabricated testing atmospheres. Generally, more academic engagement has been shown to positively impact student retention (Tinto, 1975).

Prior to the pandemic, students who used and engaged in online platforms were more likely to earn above-average grades while students who engaged less earned poorer grades (Davies & Graff, 2005). In a study of students engaged in online classes during COVID-19, Hamann et al., (2021) found lower retention rates among students than when

in-person, though student academic performance did not significantly differ. Different environmental circumstances may help explain differential outcomes between online learners before and after the COVID-19 pandemic. Despite the challenges of COVID-19, Rahiem (2021) found a majority of students reported above-average grades during the pandemic during online instruction. These inconsistencies in academic performance and retention may be due to many factors, some of which will be highlighted and examined in the current study.

The Current Study

The current study investigated the impact of social isolation and prosociality perceptions on academic outcomes in an online environment. This unprecedented time in history provides a unique opportunity to research the effects of prosociality and social isolation on students' academic performance and retention. The literature indicates reduced academic performance for students experiencing social isolation (e.g., Stoliker & Lafreniere, 2015). Concurrently, student exposure to prosociality practices and online engagement may buffer some of the negative impacts of the pandemic on academic experience. General research of online environments has grown tremendously due to COVID-19 circumstances, however, certain areas including prosociality in online environments remains relatively unexplored. Additionally, quarantine mandates, the transition to online instruction, and local/national health restrictions may factor into the impact of COVID-19 on student performance and retention.

Participants in the current study are college students enrolled in at least one online class impacted by COVID-19. An online survey captured students' perceived

prosociality, perception of social isolation, and online engagement in relation to retention intention and academic performance. Retention intention is the student's intention of re-enrolling in courses at their university in the next academic term. Academic performance was examined with self-reported GPA.

Hypotheses

1. Women will have higher scores on prosociality perceptions compared to men.
2. Mediation Model 1
    a. Students' perceived prosociality will positively predict intention to retain to the next academic term.
    b. Online engagement will mediate the relationship between prosociality perceptions and retention intention (see Figure 1).
3. Mediation Model 2
    a. Students' perceived prosociality will positively predict GPA.
    b. Online engagement will mediate the relationship between prosociality perceptions and GPA (see Figure 2).
4. Mediation Model 3
    a. Students' perceived social isolation will negatively predict intention to retain to the next academic term.
    b. Online engagement will mediate the relationship between perceived social isolation and retention intention (see Figure 3).
5. Mediation Model 4
    a. Students' perceived social isolation will negatively predict GPA.

b. Online engagement will mediate the relationship between perceived social isolation and GPA (see Figure 4).

Figure 1

Mediation Model 1: Prosociality and Retention Intention

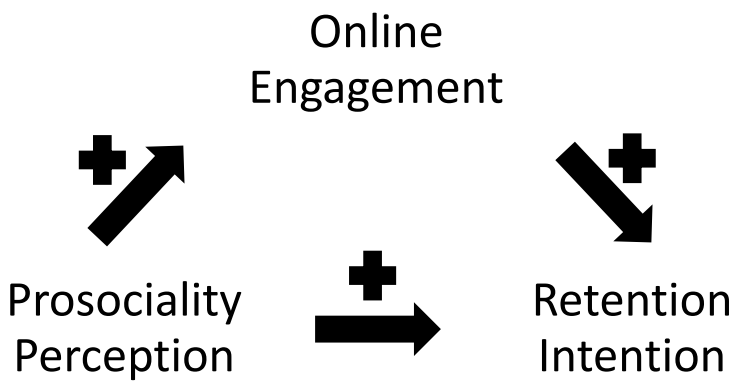


Figure 2

Mediation Model 2: Prosociality and GPA

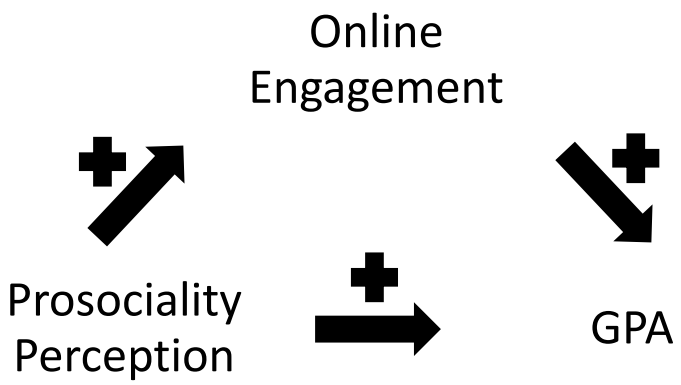


Figure 3

Mediation Model 3: Social Isolation and Retention Intention

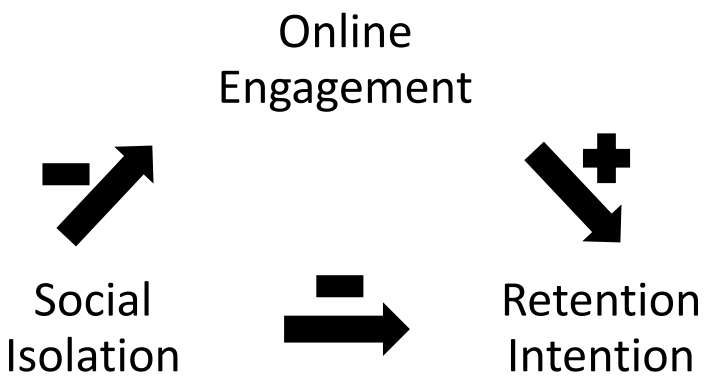
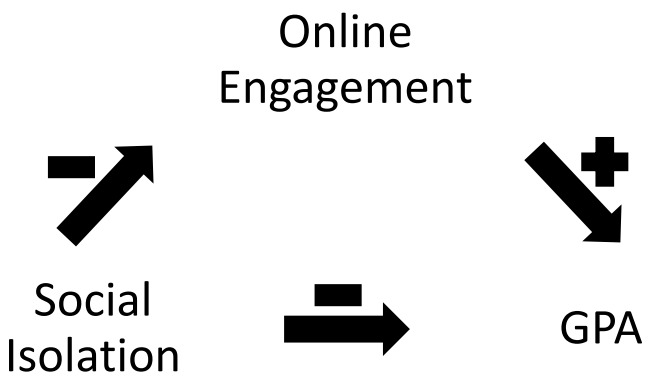


Figure 4

Mediation Model 4: Social Isolation and GPA



Method

Design

The current study employed a cross-sectional survey design. The predictor variables are perceived prosociality and perceived social isolation. Gender is also considered a predictor variable for Hypothesis 1. The proposed mediator variable is online engagement. The criterion variables are academic outcomes, specifically GPA and intention to retain to the next academic term.

Participants

A power analysis performed using G*Power found that 270 participants were needed to achieve a robust sample size with a .85 power at an alpha of .05 (Faul et al., 2007). During the recruitment period, 94 students participated in the study. The study was underpowered; this limitation will be further elaborated on in the discussion section. The participants were college students attending a rural, four-year university in California, or a community college located in the same area. All participants were at least 18 years of age and participated in at least one course during one semester of online instruction during the pandemic. Convenience sampling and snowball sampling were utilized to cast a wide net for student participants as well as outreach to faculty requesting promotion of the survey, sent via email and announced in-person.

The average age of participants was 24.2 (SD = 6.8). The sample was majority women, seniors, Pell Grant recipients, first-generation college students, full-time students, and from diverse racial/ethnic backgrounds (see Table 1). Most participants' parents had completed some college. Just over three-fourths of participants were from a

university and approximately one-fourth were from a community college. GPAs ranged from 1.98 to 4.00 with an average GPA of 3.40 (*SD* = 0.54). Participants were predominantly psychology majors (64.4%).

Procedure

Data were collected from February 2022 to April 2022, after approval from the institution's Institutional Review Board (IRB 21-097). The study was advertised to students taking psychology courses through SONA systems, an online system that manages research projects, as well as through direct instructor promotion. Interested participants signed up online via SONA systems or directly through the survey software Qualtrics. Once students signed up via SONA, they were provided a link to a survey on Qualtrics or they were directly linked to Qualtrics. Each participant was shown an informed consent page detailing the potential risks of participating. Participation in the study was confidential and anonymous. Participants moved ahead to the survey which included demographics questions and measures of perceived prosociality, classroom cooperation, perceived social isolation, online engagement, COVID-19 impacts, retention intention, and self-reported GPA.

The survey took 20-30 minutes to complete. Some student participants were compensated with extra credit within psychology classes that offered the opportunity through SONA as designated by individual instructors. Due to the sensitive nature of some questions, students were directed to a debriefing page at the end of the survey to connect them with mental health resources at their school's respective Student Health Centers.

Measures

Demographic information was collected on gender, age, race/ethnicity, class standing, student type (e.g., graduate vs. undergraduate), college major, household size, household composition (e.g., family, friends, combination), guardian's highest education level, socio-economic status measured through financial aid qualification (i.e., Pell Grant eligibility), and first-generation college student status. Age was reported in years. Gender was self-identified by participants and offered options for genderfluidity as well as non-binary identifiers. Gender was reported as man, non-binary, woman, "prefer not to say", and self-described; these options were "check all that apply" and some participants chose multiple gender identities (this is also the case with multi-racial/ethnic identifiers; see Table 1). Racial/ethnic categories were collapsed into a students of color vs. white students variable. for hypothesis testing. The students of color category was comprised of students who identified as American Indian or Alaska Native, Asian American or Pacific Islander, Black or African American, Latinx/a/o, or more than two races/ethnicities that included at least one of the above categories. Gender and race/ethnicity were dichotomized to best test the study hypotheses given an underpowered sample.

Table 1

Demographic Variables (N = 87)

Variables	*N*	%
Gender		
Man	11	12.6%
Non-Binary	5	5.7%
Self-described or prefer not to state	5	5.7%
Woman	66	75.9%
Class Standing		
Freshperson	16	18.4%
Sophomore	13	14.9%
Junior	12	13.8%
Senior	34	39.1%
Graduate and Post Baccalaureate	12	13.8%
Race/Ethnicity		
American Indian or Alaska Native	4	4.6%
Asian American or Pacific Islander	2	2.3%
Black or African American	1	1.1%
Latinx/a/o	16	18.4%
More Than One Race/Ethnicity	7	8.0%
White	57	65.5%
School Type		
Community College	19	21.8%
University	68	78.2%
Transfer Status		
Transfer	41	47.1%
Non-Transfer	46	52.9%
First Generation Status		
First Generation	53	60.9%
Continuing Generation	34	39.1%
Pell Grant		
Eligible	54	62.1%
Not Eligible	33	37.9%
Student Status		
Full-time	78	89.7%
Part-Time	7	8.0%
Varied	2	2.3%
Guardian's Highest Education		
Elementary or junior high school	9	10.3%
High school	17	19.5%
Some college or technical school	27	31.0%
Graduated from a 4-year college	13	14.9%
Some school beyond 4- year college	6	6.9%
Professional or graduate degree	11	12.6%
I don't know	4	4.6%

The following constructs were assessed and are detailed below: prosociality perception, classroom cooperation, social isolation perception, COVID-19 impact, online student engagement, retention intention, and GPA (see appendices for a list of all questions).

Perceptions of Prosociality

Perceptions of prosociality is the understanding of one's own ability to act in a positive, empathic, and helpful manner towards others. Prosociality perceptions were measured with the 16-item Prosocialness Scale for Adults (PSA; e.g., *I am emphatic with those who are in need*) on a 5-point Likert-type scale ranging from 1 (*Never/almost never true*) to 5 (*Almost always/always true*; Caprara et al., 2005; see Appendix A). An average score was created in which higher scores represented more prosocially perceived tendencies. The PSA has good internal consistency with a Cronbach's alpha of $\alpha = .91$ (Caprara et al., 2005; Luengo Kanacri et al., 2021). In the current study, the PSA had good internal consistency ($\alpha = .92$).

Prosociality Perception and Classroom Cooperation

To bridge prosociality and the school environment, we used a measure of classroom cooperation. Prosociality in the classroom includes support and helping behaviors, which intersects with prosociality. Cooperation in the classroom was measured with the 20-item Cooperative Classroom Environment Measure (CCEM; e.g., *I learn best when working with classmates*) on a 5-point Likert-type scale ranging from 1 (*Strongly disagree*) to 5 (*Strongly agree*; Premo et al., 2017; see Appendix B). An average score in which higher scores represented greater perceptions of prosociality. The CCEM was

originally validated with a sample of 400 undergraduates and has shown good internal consistency with a Cronbach's alpha of α = .83 (Premo et al., 2017). In the current study, the CCEM had good internal consistency (α = .80).

Social Isolation Perception

Social isolation and loneliness are often closely associated constructs, and as such, the following scale captures both constructs. Social isolation in the context of the current study includes feelings of disconnectedness both socially and generally. Social isolation was measured with the 20-item UCLA Loneliness Scale (U-LS; e.g., *I feel isolated from others*) on a 4-point rating scale from 1 (*I never feel this way*) to 4 (*I often feel this way*; Russell, 1980; see Appendix C). An average score was created in which higher scores indicated higher levels of perceived social isolation. The original sample for the U-LS was comprised of over 200 university students (e.g., Kraut et al., 1998; Russel et al., 1996). Higher scores indicate higher levels of social isolation. The U-LS has shown good internal consistency, with a Cronbach's alpha range of α =.89 to .94 (Russell, 1980). In the current study, the U-LS had excellent internal consistency (α = .96).

Student Online Engagement

Online student engagement is active participation in online opportunities which includes cognitive, behavioral, academic, and social involvement of students. Online student engagement was measured with the 19-item Online Student Engagement Scale (OSE; e.g., *Taking good notes over readings, PowerPoints, or video lectures.*) on a 5-point Likert type scale ranging from 1 (*Not at all characteristic of me*) to 5 (*Very*

characteristic of me; Dixson, 2015; see Appendix D). An average of scores was created in which higher scores represented greater engagement. OSE was originally validated with 180 college students and has shown good internal consistency, with a Cronbach's alpha of α = .91 (Dixson, 2015). In the current study, the OSE had good internal consistency (α = .92).

COVID-19 Impact

COVID-19 impact was measured with the 12-item World Health Organization Quality of Life Instrument which was adapted for COVID-19 (WHOQOL-BREF; e.g., *How would you rate impacts of COVID-19 pandemic on your general health?;* see Appendix E). This scale operates on a 5-point Likert type scale ranging from 1 (*Very low*) to 5 (*Very high*; Algahtani et al., 2021). An average of scores was created in which higher scores represented greater impact. WHOQOL-BREF has shown acceptable internal consistency, with a Cronbach's alpha of α = .81 (Algahtani et al., 2021). In the current study, the WHOQOL-BREF had acceptable internal consistency (α = .73). However, because Cronbach's alpha was on the lower end of acceptability, this limitation is further explored in the discussion section.

Academic Outcomes

Student Retention. Retention intention is defined as the participant's self-reported intention to remain enrolled in college after experiencing COVID-19 impacts and attending classes online. Retention intention was measured with an author-created, close-ended multiple-choice question (e.g., *Do you plan on returning to HSU next semester?*; see Appendix F). There were four response options: 1 (*Yes, I am returning for*

the following semester), 2 (*No, I am not returning*), 3 (*Undecided/don't know*), and 4 (*I am graduating from HSU this semester*).

GPA. Cumulative GPA was collected as a self-report measure of students' academic performance. GPA is reported on a 4-point scale ranging from 0.00-4.00. Self-reported GPA is reliably accurate among college students (e.g., Crockett et al., 1987).

Results

Preliminary Analysis

Data were cleaned in the open-source R Statistical Software (RStudio, 2015) and Statistical Packages for Social Sciences software (SPSS; IBM Corp, 2020). The data were visually inspected for errors and missing values as well as kurtosis and skew. Although we planned to remove participants with responses more than three standard deviations from the mean on the study variables, no participants met this criteria. Five participants were removed for incomplete surveys as they had only completed 4% of the survey (i.e., informed consent only), leaving the sample size total at $N = 89$. The means, standard deviations, and correlations between key variables were calculated (see Table 2). Main effect sizes are reported at $p < .05$.

Significant positive correlations were observed between Pell eligibility and first-generation student status, online engagement and age, GPA and online engagement, COVID-19 impact and GPA, classroom cooperation and GPA, online engagement and prosociality, COVID-19 impact and prosociality, classroom cooperation and prosociality, online engagement and COVID-19 impact, classroom cooperation and online engagement, and COVID-19 and classroom cooperation. Significant negative correlations were observed between gender (dichotomous) and prosociality.

While inspecting the data, several issues became apparent. First, retention intention could not be used as an outcome variable because it did not present adequate variation in the number of students who reported they would not continue to the next academic semester ($N = 2$). Therefore, hypotheses 2a, 2b, 4a, and 4b could not be tested.

Originally, analyses were planned with control variables. However, given the underpowered sample, a decision was made to run the mediation models without control variables. Unfortunately, this not only meant forgoing important demographic variables, but also COVID-19 impact. Both of these issues will be further discussed in the limitations section.

Table 2

Pearson's Correlations Between Study Variables

Variable	*M*(*SD*)	1	2	3	4	5	6	7	8	9	10	11
1. GPA	3.40(0.54)	--										
2. Prosociality	3.91(0.69)	.11	--									
3. Social Iso.	2.30(0.76)	.20	-.11	--								
4. Online Eng.	3.50(0.69)	.48**	.47**	-.12	--							
5. COVID-19	3.27(0.58)	.29**	.27*	.13	.42**	--						
6. Class Coop.	3.23(0.60)	.29**	.28**	-.10	.46**	.23**	--					
7. Gender[1]	--	.20	-.24*	.05	-.06	-.10	.13	--				
8. Std. of Color[2]	--	-.20	-.16	-.04	-.13	.10	-.10	.09	--			
9. Age	23.59(5.37)	.18	.15	-.01	.28**	.20	-.14	.12	-.19	--		
10. Pell Elg.[3]	--	-.16	-.11	.01	.03	.14	-.16	.03	.19	.04	--	
11. First Gen.[4]	--	-.13	-.09	.05	-.08	.15	-.16	-.03	.19	.13	.48**	--

Note. * $p < .05$, ** $p < .01$, [1]0 = woman, 1 = man, [2]0 = white students, 1 = students of color, [3]0 = not eligible for a Pell grant, 1 = eligible for a Pell grant, [4]0 = continuing generation student, 1 = first-generation college student

Hypothesis Testing

Hypothesis 1: Gender Differences in Prosociality

An independent sample *t*-test was used to test Hypothesis 1 (i.e., dichotomous gender differences in prosociality). The *t*-test found statistically significant differences between men and women, $t(76) = 2.13$, $p = .04$, $d = .69$. Specifically, women ($M = 63.43$, $SD = 11.14$) scored higher on prosociality measures than men ($M = 55.82$, $SD = 9.90$).

Hypotheses 2 and 4: Mediation Models with Retention Intention as an Outcome

Hypotheses 2a, 2b, 4a, and 4b, which examine retention intention, were forgone in the analysis stage due to insufficient variation in responses. Descriptive statistics are presented in Table 2.

Hypotheses 3 and 5: Mediation Models with GPA as an Outcome

Hypotheses 3a and 5a were tested using regression analysis. Hypothesis 3a investigated the relationship between GPA and prosociality perception. Prosociality perception was not a statistically significant predictor of GPA. Hypothesis 5a explored the relationship between social isolation and GPA. Social isolation was not a statistically significant predictor of GPA, although the effect approached statistical significance ($b = 0.20$, $p < .071$).

Hypotheses 3b and 5b were tested employing mediation analysis (Baron and Kenny, 1986). Mediation analysis identified any direct or indirect impact of online engagement as a mediator between prosociality perceptions and GPA, and social isolation and GPA, respectively. Hypothesis 3b specifically examined the mediation of online engagement between prosociality perceptions and GPA. In the first step of mediation

analysis for hypothesis 3b prosociality perception was expected to positively predict online engagement which was apparent ($b = 0.47$, $p < .001$). In the second step, online engagement was expected to positively predict GPA which was present ($b = 0.48$, $p < .001$). However, as previously mentioned in hypothesis 3a, there was no relationship between prosociality perceptions and GPA. In mediation analysis all relationships between variables need to be statistically significant to run a mediation model. Thus, there was not support for this mediation model.

Hypothesis 5b specifically examined the mediation of online engagement between social isolation and GPA. In the first step of mediation for hypothesis 5b, social isolation was expected to negatively predict online engagement; however, this step was not statistically significant. In the second step, online engagement was expected to positively predict GPA which was present ($b = 0.48$, $p < .001$). In the third step of mediation analysis for hypothesis 5b, the mediator (online engagement) did not impact the relationship between social isolation and GPA, concluding the mediation analysis as non-significant.

Discussion

The current study adds to the literature on prosociality perceptions and social isolation patterns in college students during a time of increased stress and uncertainty. While we received support for hypothesis 1, we received no support for hypotheses 3a, 3b, 5a, or 5b. Additionally, hypotheses 2a, 2b, 4a, and 4b were unviable, and therefore we were unable to determine support or lack thereof for the variables regarding retention intention.

Hypothesis 1

Hypothesis 1 examined gender differences in prosociality perceptions and found statistically significant differences between men and women which aligns with previous findings (e.g., Mavroveli & Sánchez-Ruiz, 2011). One area of interest is understanding prosociality from a gender non-binary or genderfluid perspective. It is important to note demographic shifts in gender identity that resulted in a meaningful number of participants in the sample identifying outside of man and woman.

Hypothesis 3

Hypothesis 3a examined the relationship between GPA and prosociality perceptions; there was no statistically significant relationship between the two constructs. Hypothesis 3b explored online engagement's potential mediating role between prosociality perceptions and academic performance. Despite relationships in the literature (e.g., Caprara et al., 2005), the current study found no relationship between prosociality perceptions and GPA (Hypothesis 3a). Underexplored variables related to changes in higher education such as online classrooms or additional environmental stressors may be

distinguishing factors in understanding this lack of relationship. During the pandemic, students may feel overextended thus making prosociality difficult to maintain under stressful circumstances. With additional consideration for demographic information, a majority of the sample was financial aid-eligible and a majority were first-generation students. It is possible that academic, financial, and pandemic stressors made it especially difficult for students to engage in a prosociality learning environment, even if instructors created prosocially supportive classrooms. Due to stressors faculty experience, it may have also been more difficult for instructors to create prosocially supportive environments during the pandemic and/or in an online learning environment. The pandemic may have taxed faculty and in-turn negatively affected student engagement and/or other study variables. These possibilities can be tested in future research.

On the other hand, the literature demonstrates that some students were able to achieve prosociality interactions through asynchronous resources as well as perceive faculty similarly online as they would in-person (e.g., Hazel et al., 2014; Jung et al., 2020). Online class formats (e.g., asynchronous, synchronous, hyflex) may offer more insight into the current study results or lack thereof for mediation. Considering various aspects of online engagement may be a missing key to the findings. Classrooms are varied in format, subject area, instructor presentation style, individual student makeup, and more. The online engagement measure utilized in the current study investigated individual habits of students and focused less on how students felt about online interactions with peers. Considering these variables may facilitate greater understanding of the relationship between prosociality perceptions and academic outcomes.

As with all people, students have individual experiences that color their perceptions; perceptions of prosociality are no exception. Natural tendencies of individuals and environmental factors relate to prosociality tendencies. For example, students with higher autonomous dispositions generally exhibit more prosociality toward others (Gagné, 2003). The idea of natural prosociality dispositions has also been explored within specific majors, notably the social sciences and arts (Kou et al., 2019). The majority of the participants in the current study were psychology majors which may have positively influenced average scores of prosociality perceptions as well as other study variables.

Hypothesis 5

Hypothesis 5a looked for a relationship between perceived social isolation and GPA; there was no statistically meaningful relationship between the two constructs. Hypothesis 5b proposed online engagement as a mediator of the relationship between social isolation and academic performance. Although, not statistically significant, social isolation was a trending negative predictor of GPA. This minimal support aligns with literature which highlights that social isolation has a negative impact on GPA (e.g., Dennon, 2020; Forbes et al., 2019; Naqshbandi et al., 2017). Once again, we may consider how changing educational environments like online classrooms impact social isolation.

The study's survey did not differentiate between students who may have attended the school previous to the pandemic, gained familiarity and connections with peers and instructors, and formed an identity. That said, there are potential participants in the

current study that may have never stepped foot on campus and some students that may have attended classes in-person for multiple years. These factors likely played a part in perceptions of social isolation and should be included in future research. For example, students may feel more or less supported in online classes via discussions and synchronous/asynchronous class interactions. These considerations highlight the complexity of the role of online education and mental health during the COVID-19 pandemic.

Although there was not mediation in the current study, there still may exist unexplored relationships between academic performance, social isolation or prosociality perceptions, and online engagement. Mediation is closely related to moderation, and it is reasonable to consider online engagement as a potential moderator of the relationship between prosociality perceptions or social isolation and academic performance, even when mediation failed (Kenny, 2021).

Correlations between study variables and demographics may help shed light on potential moderators or control variables for future analyses. For example, there was a positive correlation between age and online engagement. Perhaps older students are more comfortable/effective when engaging online than younger students. It should be noted that older students in the sample may be graduate students who have vastly different expectations and goals of most undergraduate students. Older students may also be seniors or returning students. A majority of the sample consisted of seniors who may have more school engagement since they are closer to graduating. Seniors also had more

opportunity to connect to the school prior to the pandemic which may suggest higher online engagement. These predictions should be tested in future analyses.

Curious correlations were apparent with the positive associations between COVID-19 impact and prosociality perceptions, online engagement, classroom cooperation, and academic performance, respectively. COVID-19 impact's positive connection to academic performance and online engagement may be the result of more time online or preferred online school environments. Although, a positive association with both prosociality perceptions and classroom cooperation should be examined with a careful eye. As COVID-19 impact grows, there is not an obvious reason why prosociality perception and/or classroom cooperation would also grow alongside the stressful impact, as gathered from the literature review. The positive correlation between classroom cooperation and online engagement may also shed light on how students engage in online classes. These may be the same students who value more classroom cooperation generally.

Prosociality perceptions and academic performance were each independently positively correlated with online engagement. Again, this could be practically explained by students needing of a certain amount of engagement to complete online courses, which positively impacts academic performance. As the literature suggested, social isolation was a potential detriment to prosociality behaviors; yet there was not an explicit link between the two constructs. More research may help elaborate relationships that may not have been transparent with underpowered data.

Limitations

While the current study was methodically constructed and thoughtfully approached, limitations are present. Time constraints and environmental factors of the global pandemic made data recruitment and collection difficult. With changing campus protocols, students may not have as much interest, nor time, to participate in an online survey. Class activities existed in a variety of spaces for students. The variation of class format and attendance options may have diffused effects when combined. During data collection some students were able to continue fully online while others may have taken hyflex, hybrid, or in-person classes. Another factor unaccounted for was the possibility of student engagement outside the classroom during the pandemic such as on-campus employment, athletics, or living on campus. These questions should be asked in future surveys.

The study design is cross-sectional, and causation cannot be interpreted. The target sample size determined by a G*Power analysis was not achieved which threatens the validity and generalizability of the results. Additionally, the survey was only administered to two schools in the local area of Humboldt County which may limit the generalizability of the findings. Additional complications arose from having an insufficient number of students to analyze subgroups of participants. For example, graduate students were included in the general sample and may have exceptional characteristics compared to undergraduate students such as higher motivation and self-sufficiency. Ideally, with a greater sample size, analyses would focus solely on undergraduate or graduate students. It would also be important to separate or control for

students at the community college and students at the university. Student status may influence variables as some participants behaviors in the school environment are held to different standards. Last, the sample was likely a positive selection of college students which may have reduced variability in variables such as retention intention. Students who were enrolled during the pandemic may be more engaged and more likely to complete extra credit opportunities than those where were not enrolled or chose not the complete extra credit for class.

Future Directions

Researchers seeking to capture student perceptions in higher education regarding academic performance and retention should consider points of revision prior to conducting further studies. Questions around retention should be clarified as some students may not be ending their academic journey but transferring to another school. This lens may offer a positive interpretation and more depth in retention research rather than focusing on a deficit perspective. Future research can include the student perspective rather prioritizing the institution.

A larger sample size is needed to examine and analyze the proposed regression models to clarify if there are mediating or moderating relationships between the study variables. Additionally, a longitudinal survey, specifically a cross-lagged research design, would allow researchers to disentangle directionality effects. Recruitment efforts aimed at larger populations would also yield a more representative sample. Beyond sample size, studies looking to understand prosociality may benefit from measuring both student and faculty experiences in shared spaces and interactions. As technology advances for online

schooling, student-faculty interactions will likely reflect changes that are worthy of future study.

On the topic of measurements and scales, it would be beneficial to either find or create an updated and more relevant version of WHOQOL-BREF/COVID-19 impact if this study were to be replicated. The WHOQOL-BREF's internal consistency waivers in acceptable territory – another issue a larger sample size may mitigate. Additionally, social isolation prevalence was not compared with a baseline sample, but this step would be beneficial to further understand overall patterns of social isolation in student populations. Last, social isolation may benefit from a clean differentiation from loneliness to lessen potential overlap between the two constructs.

Implications

Stakeholders, such as education agencies, education institutions, instructors, and students/families, may be interested in future studies with larger samples. Additionally, educational environments continue to change due to the COVID-19 pandemic and its associated stressors. Universities and colleges should strive to create the best environment for their students by continuing to consider important variables like students' prosociality perceptions and social isolation.

Conclusion

The current study showcases college student engagement and academic success while considering social, personal, and environmental impacts. The expanded examination of student behavior using prosociality perceptions and social isolation is a unique addition to the literature and provides a rounded vantage of Tinto's foundational retention theory (Tinto, 1975). Additional ecological points of impact shed light on college students' nuanced experiences especially during the unprecedented COVID-19 pandemic.

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Appendix A

Prosocialness Scale for Adults (PSA; Caprara et al., 2005).

Please answer using the following scale:

1. Never/almost never true
2. Occasionally true
3. Sometimes true
4. Often true
5. Almost always/always true

	Item	**Subcategory**
1	I am pleased to help my friends/colleagues in their activities	PA
2	I share the things that I have with my friends	PA
3	I try to help others	PA
4	I am available for volunteer activities to help those who are in need	PA
5	I am emphatic with those who are in need	PF
6	I help immediately those who are in need	PA
7	I do what I can to help others avoid getting into trouble	PA
8	I intensely feel what others feel	PF
9	I am willing to make my knowledge and abilities available to others	PA
10	I try to console those who are sad	PA
11	I easily lend money or other things	PA
12	I easily put myself in the shoes of those who are in discomfort	PF
13	I try to be close to and take care of those who are in need	PA
14	I easily share with friends any good opportunity that comes to me	PA
15	I spend time with those friends who feel lonely	PA
16	I immediately sense my friends' discomfort even when it is not directly communicated to me	PF

Appendix B

Cooperative Classroom Environment Measure (CCEM; Premo et al., 2017)

Please answer using the following scale:

1. Never/almost never true
2. Occasionally true
3. Sometimes true
4. Often true
5. Almost always/always true

Subscale	**Item**	
Value of working with classmates	Class is more enjoyable when I work with other students.	1
	I would rather work alone then with a partner. (reverse)	2
	I learn best when working with classmates.	3
	I receive better grades when working with other students.	4
	I prefer to take classes where students work together to solve problems.	5
Friendship	I know my classmates from outside of class.	6
	Friendships built in this class have extended outside of it.	7
	I have friends in class I spend time with outside of class.	8
Reciprocity	If I contribute to a group project others will also.	9
	If I help a classmate with a question they will help me with other questions later.	10
	Classmates I help tend to help me back	11
Enforcement of cooperation	Classmates that do not cooperate in class should receive lower grades.	12
	The teacher should encourage classmates that are not contributing in class to contribute.	13
	Classmates who contribute their ideas to discussions are the ones I want to work with in class.	14
	I avoid working with classmates who do not contribute in class.	15
Benefit from classmate ideas	The more classmates participate in class discussions, the more I understand.	16
	When classmates share their ideas it helps me learn.	17
	I am willing to help classmates outside of class if they need it.	18
Willingness to help classmates	I help other classmates during class when they need help.	19
	I would rather help a classmate out when I finish my work than sit around and wait.	20

Appendix C

UCLA Loneliness Scale (Russell et al., 1980)

Scale:
Please answer each item indicating how often each of the statements below is descriptive of you:
1. I never feel this way
2. I rarely feel this way
3. I sometimes feel this way
4. I often feel this way

	Item
1	I am unhappy doing so many things alone
2	I have nobody to talk to
3	I cannot tolerate being so alone
4	I lack companionship
5	I feel as if nobody really understands me
6	I find myself waiting for people to call or write
7	There is no one I can turn to
8	I am no longer close to anyone
9	My interests and ideas are not shared by those around me
10	I feel left out
11	I feel completely alone
12	I am unable to reach out and communicate with those around me
13	My social relationships are superficial
14	I feel starved for company
15	No one really knows me well
16	I feel isolated from others
17	I am unhappy being so withdrawn
18	It is difficult for me to make friends
19	I feel shut out and excluded by others
20	People are around me but not with me

Appendix D

Online Student Engagement Scale (OSE; Dixson, 2015)

Within that course, how well do the following behaviors, thoughts, and feelings describe you? Please answer using the following scale:

1. Not at all characteristic of me
2. Not really characteristic of me
3. Moderately characteristic of me
4. Characteristic of me
5. Very characteristic of me

	Item
1	Making sure to study on a regular basis
2	Putting forth effort
3	Staying up on the readings
4	Looking over class notes between getting online to make sure I understand the material
5	Being organized
6	Taking good notes over readings, PowerPoints, or video lectures
7	Listening/reading carefully
8	Finding ways to make the course material relevant to my life
9	Applying course material to my life
10	Finding ways to make the course interesting to me
11	Really desiring to learn the material
12	Having fun in online chats, discussions or via email with the instructor or other students
13	Participating actively in small-group discussion forums
14	Helping fellow students
15	Getting a good grade
16	Doing well on the tests/quizzes
17	Engaging in conversations online (chat, discussions, email)
18	Posting in the discussion forum regularly
19	Getting to know other students in the class

Appendix E

World Health Organization Quality of Life Instruments (WHOQOL-BREF; Algahtani et al., 2021)

Please answer using the following scale:

1. Very low
2. Low
3. Neutral
4. High
5. Very high

	Item
1	How would you rate the impacts of the COVID-19 pandemic on your quality of life?
2	How would you rate impacts of the COVID-19 pandemic on your general health?
3	How would you rate the impacts of the COVID-19 pandemic on your feelings of being safe in your daily life?
4	How would you rate the impacts of the COVID-19 pandemic on your physical environment?
5	Keeping in view the impacts of the COVID-19 pandemic, how available to you was the information that you needed in your daily life?
6	How would you rate the impacts of the COVID-19 pandemic on your income?
7	How would you rate the impacts of the COVID-19 pandemic on your access to health services?
8	How would you rate the impacts of the COVID-19 pandemic in maintaining relationship with your friends?
9	How would you rate the impacts of the COVID-19 pandemic in maintaining relationship with your family?
10	Keeping in view the impacts of the COVID-19 pandemic, ‘how satisfied were you with the support you get from your friends?’
11	To what extent does faith give you comfort to deal with hard time of the COVID-19 pandemic?
12	How would you rate the impacts of the COVID-19 pandemic on your spiritual connections/practice?

Appendix F

Demographic and other author-created created questions.

	Item	Capturing
1	What is your gender?	Gender (multiple)
2	How old are you?	Age
3	To what racial/ethnic group do you belong?	Race/Ethnicity
4	What is your class standing? (FR, SO, JR, SR, PB, GR)	Class standing
5	Did you start at HSU as a (1) first-time first-year student, (2) transfer student, (3) post-baccalaureate student, or (4) graduate student?	Student type
6	What is your major?	Major
7	How many people live in your current residence with you?	Household size
8	Is your current household makeup: (1) family, (2) friends/roommates, (3) mixture, (4) just you, (5) other?	Household composition
9	What is the highest level of education that your parent or guardian 1/guardian 2 has completed: (1) Less than a high school diploma, (2) high school diploma, (3) some college, (4) associates degree, (5) bachelor's degree, (6) master's degree, (7) advanced degree, (8) unknown?	Guardian's education level (repeat for 2 guardians)
10	Do you qualify for financial aid?	Socio-economic status
11	Are you a first-generation college student?	First-generation status
12	Do you plan on returning to your current university/college next semester? (1) Yes, I am returning for the following semester, (2) No, I am not returning, (3) Undecided/don't know, (4) I am graduating this semester.	Retention intention
13	What is your current college GPA?	GPA (0.00-4.00)
14	Did you participate in online college-level courses after January 2020?	(Y/N)
15	Did you participate in online college-level courses before January 2020?	(Y/N)
16	How many online college-level courses did you participate in before January 2020?	(##)
17	How would you rate your preference for online college-level courses versus in-person courses?	(1 Prefer Online - 5 Prefer In-Person)
18	Have you postponed taking any courses online because your preference is to take them in-person?	(Y/N)