

The Trilemma of 2020: Understanding Higher Education's Fall 2020 Reopening Decision Amidst the COVID Crisis

American Business Review
Nov. 2021, Vol.24(2) 32 - 61
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ISSN: 2689-8810 (Online)
ISSN: 0743-2348 (Print)

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<https://doi.org/10.37625/abr.24.2.32-61>

ABSTRACT

In the summer of 2020, as the COVID-19 pandemic continued to spread around the world, institutions of higher education were faced with three options in terms of their teaching modality for fall 2020: resume in-person education, switch to online delivery, or adopt a hybrid approach. This observational research study aims to tease out the variables that explain the decisions announced in summer 2020 by various colleges and universities in the United States for their planned instruction for fall 2020. We propose and test eight hypotheses related to the decision. The study found statistical confirmation that universities with higher financial stability and/or prestige tended to select the online delivery option, while lower financial stability/prestige showed a preference to stay with in-person delivery. We also found public institutions were more likely to go online than private ones. Additionally, we found statistical support for our hypotheses that universities located in Republican leaning states and also those with a religious affiliation would prefer the in-person modality. The results also confirmed our hypothesis that universities offering a higher percentage of humanities degrees would have a greater probability of choosing the in-person modality. Interestingly, we did not find statistical support for our hypothesis that the level of COVID spread in the geographical area of a university's location would affect its decision.

KEYWORDS

Pandemic, Decision-Making Under Crisis, Organizational Isomorphism, Multinomial Logistic Regression, Corporate Social Responsibility

INTRODUCTION

"We're tired of the gaslighting, tired of the secrecy, tired of being treated like cash cows by a University with such blatant disregard for our lives." The Daily Tar Heel editorial 8/16/20 (Tar Heel, 2020, para. 14).

"As Cornell's president, I feel acutely our responsibility to safeguard the health and well-being of not only our students, but of our entire community: those who study and work at Cornell, and those living in the region we call home. As we have determined our path forward during this pandemic, I want to be absolutely clear that every one of our decisions has been, and will continue to be, driven by that responsibility, not by our own financial considerations." Dr. Martha Pollack, President, Cornell University (Pollack, 2020, para. 2).

As of March 26, 2020, as the Coronavirus pandemic unfolded, at least 1,100 colleges and universities in the US closed their campuses and switched to online classes for the spring semester (Tar Heel, 2020). During the spring and the summer, university administrators had to decide on the mode of education delivery for fall 2020. Broadly speaking, they had to make one of three choices -- continue

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with in-person classes as usual, switch to predominantly online delivery or straddle these two “extremes” through a hybrid strategy utilizing a mix of online and in-person classes.

The administrators making this difficult choice had to balance the health of their school community and the larger society against the prospects of significant revenue loss and the potential for diminished educational outcomes. By August, many schools had sustained losses from the spring semester due to the refunding of room and board (West, 2020). Based on the experience of online classes in spring, reports indicated that students and parents would want tuition reduction in the fall if classes were online. Some predictions also indicated that if classes were online, newly admitted students might opt to defer starting college until the epidemic was over or attend other schools that had lower tuition. A contracting economy and soaring unemployment could also put college out of reach for some students. If schools were to offer in-person classes, there would be significant costs to retrofit the campus to provide a relatively safe environment. The novelty of the situation left administrators with little precedent for guidance, but they were nevertheless forced to announce a decision. Given the novelty of the situation and its wide-reaching impacts, we felt that it would be useful to understand the factors that explain the decision.

Apart from throwing light on a unique situation, we contribute to the literature on decision-making in the context of how organizations make the trade-off between their own viability and broader societal concerns. This study uses data on non-profit public and private universities. Though labeled as “non-profit” these organizations nevertheless have an imperative to generate “profits” in the form of operating surpluses which they can use to ensure their long-term viability.

As Toutkoushian and Raghav (2017, p. 3) note, “Although these excess revenues are not technically profits because they cannot be distributed to owners or shareholders as in the for-profit world, they arguably function in a similar manner as profits for colleges and universities. Colleges can transfer operating margins into quasi-endowments that can be saved and used in the future to support their educational activities and mission. As a result, some economists have treated colleges as profit-maximizing organizations...”

Research studies support the notion that business practices of for-profit and non-profits are tending to converge (Ramirez & Janiga, 2009; Alter, 2006). Further, recent research reveals that private non-profit institutions generally generate profits. Toutkoushian and Raghav (2021) found that in 2014-2015, private non-profit institutions realized \$19 billion in excess revenues and that outside of recessions, it is typical that these types of institutions bring in more revenue than they spend. Further, they note that it is generally accepted in the economics literature on non-profit organizations that they are increasingly acting like for-profits, and that (p. 126), “The same trend has been seen in higher education, where the notion of academic capitalism (Slaughter & Rhoades, 2004) holds that nonprofit colleges have adopted practices and behaviors similar to for-profit businesses (Washburn, 2008; Bok, 2009; Christensen & Eyring, 2011).” With the above in mind, our research has implications for businesses in general.

During the summer of 2020, universities started to announce their plans for instructional delivery for fall 2020 – in-person, hybrid or online delivery. Some universities were quick to announce that they would deliver almost all of the education online and others, equally quickly announced that they would resume in-person education. Several others announced hybrid delivery. Global response to the pandemic clearly indicated a scientific consensus that the world was dealing with a deadly virus. As of summer 2020, there was no medical consensus on how to treat infected people. No vaccines were expected until very much later. Under such dire conditions, it is perhaps surprising that some universities confidently announced plans to return to business as usual.

Government support provided some assistance to institutions and students. The federal bailout program CARES allocated \$14 billion for higher education in March 2020 (CARES Act: Higher Education Emergency Relief Fund, 2021; Higher Education Provisions in CARES Act, 2020). The Consolidated

Appropriations Act provided an additional \$23 billion to higher education in December 2020 (Associated Press, 2020), and the American Rescue Plan added another almost \$40 billion (Luhby & Lobosco, 2021; Murakami, 2021). In each case, about half of the funding went to institutions while the other half was directed to students, meaning roughly \$39 billion was allocated to institutions. While this is a significant level of emergency funding, the climate for non-profit universities, especially for the bulk of schools with small endowments, remained challenging, given the costs resulting from the pandemic. One researcher estimated some \$85 billion in lost revenue for higher education, an additional \$24 billion in expenses related to COVID-19 and \$74 billion in potential future decrease in state support for a total of \$183 billion in total negative financial impact on higher education (Whitford, 2021; Friga, 2021). That is, the amounts allocated to individual schools from the various bailout programs would at best only cover a small portion of the shortfall.

We contribute to theory by proposing and testing, through observational research, eight hypotheses that relate the following characteristics of universities to their decision for fall 2020 as of summer 2020:

- Financial strength
- Selectivity in admissions
- Control (public or private)
- Political affiliation of the state where a university is located
- Whether secular or not
- Local COVID-19 infection rate
- Level (two or four-year)
- Humanities degrees awarded as percent of all degrees

Section 2 reviews the extant literature and the theoretical perspectives pertinent to this research. Section 3 lays down our theoretical framework in the form of eight hypotheses. Section 4 describes our dataset and presents an exploratory analysis of our multi-faceted dataset. The first part of section 5 presents several bivariate analyses that link some independent variables of interest with the chosen fall 2020 instructional modality. This analysis was conducted in the spirit of a preliminary exploration of our hypotheses as well as a further exploratory study. The second part of section 5 presents a multivariate analysis to rigorously test our hypotheses. Section 6 concludes with some directions for further research.

LITERATURE REVIEW

Higher education, like other segments of business, has had its share of substantial threats from external forces in the past (Moerschell & Novak, 2020). Arguably, the 2008 financial crisis is most similar to the COVID-19 crisis in that all universities and even society as a whole were confronted with significant financial pressure.

Several research studies documented how universities dealt with the crisis. A comprehensive study by Long (2014) on the effects of the 2008 financial crisis concluded that college enrollments increased after the initial shock from the crisis. However, this growth varied by the region, race, part-time/full-time enrollment, and type of degree. Long also found that tuition costs increased but that this too was a function of region. Geiger (2010) found that after the 2008 financial crisis, many students were forced to choose less selective and expensive schools, opting for public institutions instead of private and commuting instead of boarding. Wolinsky (2009) looked at the impact that the stock market decline had on endowments and therefore on university budgets.

Jones and Wellman (2010) discussed how the 2008 financial crisis was different from past crises for public institutions as states and the federal government were in far worse shape and therefore less likely to provide long term funding. They suggested that universities use this as an opportunity to make cost structuring decisions as opposed to just cost-cutting.

As the COVID-19 crisis is still unfolding, there is little research available on its impact. Crawford et al. (2020) did a limited survey of universities around the world and found that for spring 2020, the majority of schools in developed and developing countries moved to online instruction. However, they did not find country-wide policies for either group.

Our paper looks at the decisions made by institutions of higher education impacting a core element of their enterprise under extreme duress and significant uncertainty. We view these decisions from two theoretical perspectives – organizational isomorphism and the corporate social responsibility (CSR) Pyramid.

We would expect that universities with similar characteristics would tend to make similar decisions. The stream of literature relating to organizational isomorphism is thus germane to any examination of this situation.

DiMaggio and Powell (1983, p.149) define isomorphism as “a constraining process that forces one unit in a population to resemble other units that face the same set of environmental conditions.” They identify three types of organizational isomorphism: coercive, where the force is external; mimetic, where organizations imitate others in uncertain times; and normative, where the force is professional norms, like licensing.

Applying organizational isomorphism to higher education, Hearn and Belasco (2015, p. 395) examine the factors that “drive four-year colleges’ commitments to undergraduate humanities degree production over time.” They found, for example, support for the hypotheses that smaller institutions, private (as opposed to public) institutions, and institutions where students mainly attend full-time were more likely to maintain their commitment to the humanities. (They tested eight hypotheses in all.) Gates (1997) examined retrenchment at a state university and found all three isomorphic pressures in action. Fay & Zavattaro (2016) looked at how large research institutions made branding decisions and found these schools developed similar strategies, suggesting mimetic isomorphism. Kezar and Bernstein-Sierra (2019) examined “the Association of American Universities STEM initiative ... and the ability of a national organization and its member institutions to reshape norms about the importance and value of teaching and dedicated efforts to teaching improvement.”

Tight (2015) uses the term “academic drift” to describe the movement of structures and norms of colleges and universities towards those of more prestigious universities. Morphey and Huisman (2002), Harris and Ellis (2019) and Morphey (2009) have viewed this phenomenon through the lens of organizational isomorphism. Hersberger-Langloh, Stühlinger, and von Schnurbein (2021) explore the impact of organizational isomorphism on managerialism in non-profit organizations, with a focus on the possible impact of organizational isomorphism on mission drift.

The Corporate Social Responsibility (CSR) Pyramid, originally proposed by Carroll (1991) and subsequently studied extensively (Pinkston & Carroll, 1996; Visser, 2006; Yelkikalan & Kose, 2012; Carroll, 2016; Masoud, 2017) also informs any analysis of organizational decisions, especially those in crisis situations. According to the CSR pyramid, we can view organizations, like people, as organizing their responsibilities in a hierarchy. Organizations will tend to prioritize actions related to their economic responsibilities before decisions that reflect other responsibilities. Figure 1 shows the CSR Pyramid Carroll (1991).



Figure 1. The Corporate Social Responsibility Pyramid (Carroll 1991)

In the context of the COVID-19 pandemic, universities were forced to balance the economic risks of continuing to limit in-person education in fall 2020 against other considerations like the health risks to their stakeholders and to larger society if they were to revert to in-person education. Similarly, for Fall 2021, they are being forced to strike a balance between economic considerations and strict inoculation and mask mandates.

CONCEPTUAL FRAMEWORK

Based on theoretical support and general reasoning, we propose the following eight hypotheses to explain the delivery-mode decision.

FINANCIAL STRENGTH

Online delivery has been disrupting higher education for some time now (Jacoby, 2014). Govindarajan and Srivastava (2020) raise the possibility that, like many other temporary phenomena that became permanent, the tryst with extensive online education during the pandemic can leave a more permanent mark. COVID has increased financial pressure on universities (Korn et al., 2020; Hobson & Hagen, 2020; Carlson, 2020). Some smaller colleges had already closed by August 2020 (Aslanian, 2020). Turk and Ramos (2020) surveyed university presidents and many cited financial viability as a top concern as a result of the pandemic. Since January 2020, 20% of the students have changed their first

choice schools with cost and COVID being important reasons (Kim et al., 2020).

We can reasonably assume that during summer 2020, universities would have thought that if they chose to go predominantly online or use the hybrid option, then they would see a revenue reduction from boarding and lodging and other related sources. More critically, they would have also expected to see reductions in tuition revenues for two reasons: a) some students would not want to pay full tuition for online courses and hence shift to cheaper options; b) some students, based on reservations about online education, might take a break semester. Retrospectively, the survey by Turk and Ramos (2020) found that many university presidents attributed a decline in enrollments in fall 2020 to the shift to online education.

Extending Abraham Maslow's (1943) hierarchy of needs to organizations, Yelkikalan and Kose (2012) proposed the Corporate Social Responsibility (CSR) Pyramid, whereby organizations have a primary need to ensure economic stability before addressing legal, ethical and other responsibilities. We therefore hypothesize that financially weaker universities are more likely to choose the traditional in-person option than other options like hybrid or online.

Hypothesis 1: *The weaker a university was financially, the more likely it was to choose the in-person option; conversely, the stronger a university was financially, the more likely it was to choose the online or hybrid options.*

SELECTIVITY

As discussed above, using the online or hybrid option is likely to risk destabilizing enrollments as students might opt for less expensive options. This is supported by the finding that students perceive that they have to teach themselves in online courses and feel more disconnected from instructors (Otter et al., 2013). However, this effect might be moderated by selectivity. Students in more selective universities might be less likely to seek lower cost options as they might place a premium on reputation/quality. Also, for new admissions, more selective schools will have longer waitlists and therefore be able to fill the seats of students who opt for other schools. Interestingly, for fall 2020, the University of Pennsylvania did not have to go deeper than usual into their waitlist (Singh, 2020). Harvard's acceptance rate for Fall 2020 was also not significantly different from prior years. Finally, we note that greater selectivity is likely to be positively correlated with financial strength (Clotfelter, 2017; Coudriet & Schiffrin, 2019).

We therefore hypothesize that more selective schools will have a lower threat of reduced enrollments and therefore choose the online option.

Hypothesis 2: *The more selective a university was, the more likely it was to choose the online or hybrid options (and conversely the less selective a university was, the more likely it was to choose the in-person option).*

CONTROL (PUBLIC VS. PRIVATE)

Tompkins (2020) states that although many public K-12 schools went fully online, private schools in their vicinity were more likely to offer in-person education. They reason that private schools might not face as stringent health restrictions as public schools and also, with many fewer students, be in a better position to conduct classes with social distancing. Similar reasoning could apply to public and private universities as well.

In July 2020 ACENET surveyed university presidents on their plan for course delivery in the upcoming fall (Turk and Chessman, 2020). Fifty-four percent of the presidents at public universities

answered that they plan to run courses predominately online compared with 31% of presidents at private universities. In 2019, public universities had 16% of courses predominately or fully online compared with 7% at private universities.

Barr and Turner (2013) found that dramatic reductions in budget allocations from state sources has increased the cost burden on individuals. COVID-19 is likely to further exacerbate this pressure and is another factor that argues against enrollment pressure on public universities if they go online.

Private schools with higher tuition are likely to face higher enrollment pressures if they choose to go online or hybrid as students question whether the high tuitions are justified. However, public schools would face far lower enrollment pressure as they are the low-cost option. We therefore hypothesize that public universities, faced with a much lower enrollment threat, are likely to choose the online option.

Hypothesis 3: *Public universities were more likely to choose the online option than were private universities.*

POLITICAL INFLUENCES

There has been a considerable amount of research on differences in perception and behavior related to the COVID-19 pandemic based on political affiliation.

Calvillo et al. (2020, p. 1120) surmised, “conservatism would predict lower perceived vulnerability to COVID-19, less perceived severity of COVID-19, more agreement with a conspiracy statement and [more agreement with] a media exaggeration statement, and estimates of fewer confirmed cases and deaths from COVID-19”. All of these hypotheses were supported. A Pew Research Center (2020, para. 8) poll supported this partisan divide, noting, “59% of Democrats and Democratic-leaning independents say the outbreak is a major threat to the health of the U.S. population as a whole; only 33% of Republicans and Republican leaners say the same.” Another Pew poll conducted a month later (Daniller, 2020, para. 4), indicated, “87% of Democrats and Democratic-leaning independents say their greater concern is that states will lift the restrictions too quickly, compared with 47% of Republicans and Republican leaners.”

Van Holm et al. (2020) focused on differences in behavior related to COVID-19, based on political identity. They found (p. 1) that “liberals and moderates make fewer trips than conservatives and are more likely to change their behavior in ways suggested by government recommendations and guidelines.” Leventhal et al. (2020), studied young adults, primarily in the Los Angeles area, and found (p. 399) that, “self-reported Republican political party affiliation was associated with less frequent physical distancing and participating in social recreational activities that may perpetuate the COVID-19 pandemic.”

Barrios and Hochberg (2020, abstract) determined that “the higher the percentage of Trump voters in a county, holding all else equal, the lower the perception of risk associated with the COVID-19 virus and the lower the level of social distancing behavior exhibited.”

According to a poll conducted by The University of Chicago Divinity School and The Associated Press-NORC Center for Public Affairs Research (Schor & Swanson, 2020, para. 4), “Republicans are more likely than Democrats to say prohibiting in-person services during the coronavirus outbreak violates religious freedom, 49% to 21%.”

Singal (2020) explains the striking difference among the proportions of Democrats and Republicans using the theory of cultural cognition (Boholm, 1996). Newport (2020) also cites a Pew survey that finds that Republicans are less likely than Democrats to express confidence in scientists. Allcott, et al. (2020) and Grossman et al. (2020) also found partisan differences in Americans’ response to COVID-19.

So, within red states, it would seem reasonable to assume that there were more decision makers

who are less likely to take the crisis seriously and therefore more likely to opt for the in-person modality. Along these lines, with respect to decisions made during the COVID-19 crisis, a survey of university presidents conducted by the American Council on Education (Taylor et al., 2020) revealed that 75% of the presidents said the state governors were the most influential stakeholder when deciding if resuming in-person classes would be safe.

Hypothesis 4: *Universities in red states were more likely to have opted for in-person delivery.*

SECULAR VS. RELIGIOUS

DeFranza et al. (2020, p. 1) noted that there are two schools of thought regarding the relationship between religiosity and conformity to COVID-19 mitigation policies (like shelter-in-place advisories): “One stream predicts greater adherence because of rule-abiding norms and altruistic tendencies, whereas another has predicted lower adherence as a reaction against the restriction of personal and religious freedom.” The study they conducted provided mixed results: “When a shelter-in-place directive had not been imposed, religiosity did not affect people’s movements. However, when the directive was imposed, higher religiosity resulted in less adherence to shelter-in-place directives.”

Hill, Gonzalez and Burdette (2020, p. 2229) indicated that “more religious states tend to exhibit higher average mobility scores and slower average declines in mobility. Findings also suggest that state stay-at-home orders have a weaker impact on mobility in more religious states.”

A Pew Research Poll conducted in March of 2020 (Smith, 2020, para. 9) found that white Christians were more confident in Trump’s coronavirus response, and say Trump accurately assessed coronavirus risk, than other groups. The study also revealed that white Evangelicals are “less likely than other groups to say COVID-19 poses a major threat to the health of the U.S. population or to day-to-day life in their local communities.”

With these results in mind, we contend that religious oriented institutions would be more likely to minimize COVID-19 concerns and tend to hold in-person classes.

Hypothesis 5: *Religiously-oriented universities were more likely to choose the in-person option than those that were not religiously affiliated.*

LOCAL COVID-19 RATE

It would seem reasonable that college and university administrators and other stakeholders would consider the local COVID-19 rate when choosing a teaching modality. That is, higher local COVID-19 rates would seem to dictate online teaching, while lower rates would seem to more readily allow the possibility of in-person teaching.

Hypothesis 6: *Institutions with high local COVID-19 rates were more likely to choose the online option than those with lower local COVID-19 rates.*

HIGHEST DEGREE AWARDED (TWO-YEAR VS. FOUR-YEAR)

Almost all the two-year colleges in our data set are public institutions. As noted above, we hypothesize that public schools would be more likely to opt for online, as opposed to in-person. We note as well that two-year colleges tend to be commuter schools, without dormitories and meal plans, and there’s relatively little in the way of revenue-generating athletic programs, so moving to online would entail minimal financial losses on these fronts. Additionally community colleges are less likely to be able to

afford the significant infrastructure costs of retrofitting classrooms to accommodate a hybrid or in-person modality with COVID-19 safety precautions. According to at least one pre-pandemic survey (National Center for Education Statistics, 2019), four-year and two-year undergraduate programs seem to have been on par in terms of distance education participation, with 34.5% and 34.3% of students respectively taking at least one distance education course.

Hypothesis 7: *Two-year schools were more likely to choose the online option than four-year schools.*

PERCENTAGE OF HUMANITIES DEGREES OFFERED

An Inside Higher Education article (Flaherty, 2020, para. 2) noted, “Most humanities professors likely do not have ideal training: according to the American Academy of Arts and Sciences’ most recent survey of humanities departments, 70 percent were not offering a single online course as of 2017.” Evans and McIntyre (2016, p. 4) report that, “Teaching the humanities online invites a different set of issues than science or math.” In their study of MOOCs in the humanities, they examined the Coursera, edX, and Udacity course offerings as of March 31, 2013 and reported that humanities courses comprised just 17% of all offerings from the three providers. It seems that due to the nature of the material, associated pedagogy, or the predilection of instructors, humanities courses have historically been less-likely to be offered online. With this in mind, we suggest the following hypothesis.

Hypothesis 8: *Schools with a higher fraction of degrees awarded in the humanities were more likely to choose the in-person option.*

Each of our eight hypotheses relates specific variables to the decisions that universities made – that is, universities that are similar in some respects can be expected to be more likely to make similar decisions – in other words, exhibit isomorphism.

DATA

DATA SOURCES

Data for our study came from four sources.

1. College reopening plans. The Chronicle of Higher Education and the Davidson Institute (2020) collected data pertaining to the reopening plans of various educational institutions via a website where representatives of the institutions self-reported one of the following decisions: Fully in-person, Fully online (no students on campus), Fully online (some students on campus), Hybrid, Primarily in-person, Primarily online, TBD and Other. As the last two options would not be useful in analysis of the drivers of the decision to hold classes primarily online or primarily on campus, we eliminated those rows from further consideration. We were left with a dataset containing 1962 rows. This data was as of August 4, 2020.
2. College rankings. We used the annual rankings from US News and World Report (2020) as a measure for selectivity. US News provides separate rankings for “National Universities” and “Liberal Arts Colleges.” Only a small fraction of the institutions in our data set were ranked here – 336 in the national rankings and 165 in the liberal arts ranking. Using only one or the other would severely restrict the number of institutions available for analysis. To somewhat ameliorate this issue, we combined the two sets into one by standardizing the ranking of each

institution within its own category, and then using these values as a single variable, “standardized rank.” As the number of schools ranked was relatively limited and only pertained to private institutions, we used the standardized ranking for our exploratory (bivariate) analysis, but did not include this variable in our confirmatory (multivariate) analysis.

3. Financial health. Forbes (Coudriet & Schiffrin, 2019) calculates a financial GPA which measures the overall financial health of private, not for profit schools. Of the 1962 institutions in our data set, only 699 were evaluated by Forbes, and none of these were public institutions; we used this data in our bivariate analyses, but because of these limitations, did not include financial GPA in the multivariate analysis. We also collected endowment data, reasoning that schools with large endowments were in better financial shape than those with small or no endowments. Again, we were limited by sample size, with only 587 observations available and, as for the Forbes data, only private institutions were included, so again we only used this variable in our bivariate analysis. As a surrogate measure for financial health we used average faculty salary in our multivariate modeling. Average faculty salary was strongly correlated with financial GPA.
4. The US Department of Education (2020) provides a wealth of data on its College Scorecard website. Here we obtained data on control (public/private), level (two-year vs. four year), religious affiliation, admission rates, mean SAT scores, and the percentage of degrees awarded in various fields (which allowed us to determine the percentage of humanities degrees awarded).

Appendix A provides more details on the data preparation and Appendix B explains how we computed the percentage of humanities degrees offered by each university.

DATA OVERVIEW

There were 1,962 institutions in our data set. Table 1 provides the summary statistics for the relevant numeric variables.

Table 1. Summary Statistics for Numeric Variables in the Dataset

Variable	Min	Median	Mean	Max	Std. Dev.	n
Admission Rate	0.04	0.69	0.66	1.00	0.20	1223
Mean SAT Score	836	1129	1150	1545	123.95	1015
Financial GPA	0.72	2.12	2.24	4.50	0.82	699
County Cases per 100K Residents	22	1010	1148	8761	830.82	1962
US News Ranking – Standardized	-1.7807	0.0566	0	1.2261	1	501
Average Faculty Salary	\$1,027	\$7,416	\$7,756	\$20,484	\$2,298	1952
FY 2019 Total Endowment	\$3,785	\$148,794	\$851,355	\$39,427,896	\$3,027,704	587
Percent Humanities Degrees	0.0%	34.3%	36.7%	100.0%	21.5%	1962

Figure 2 shows the bar charts for the categorical variables that we used in our bivariate or multivariate analyses that follow.

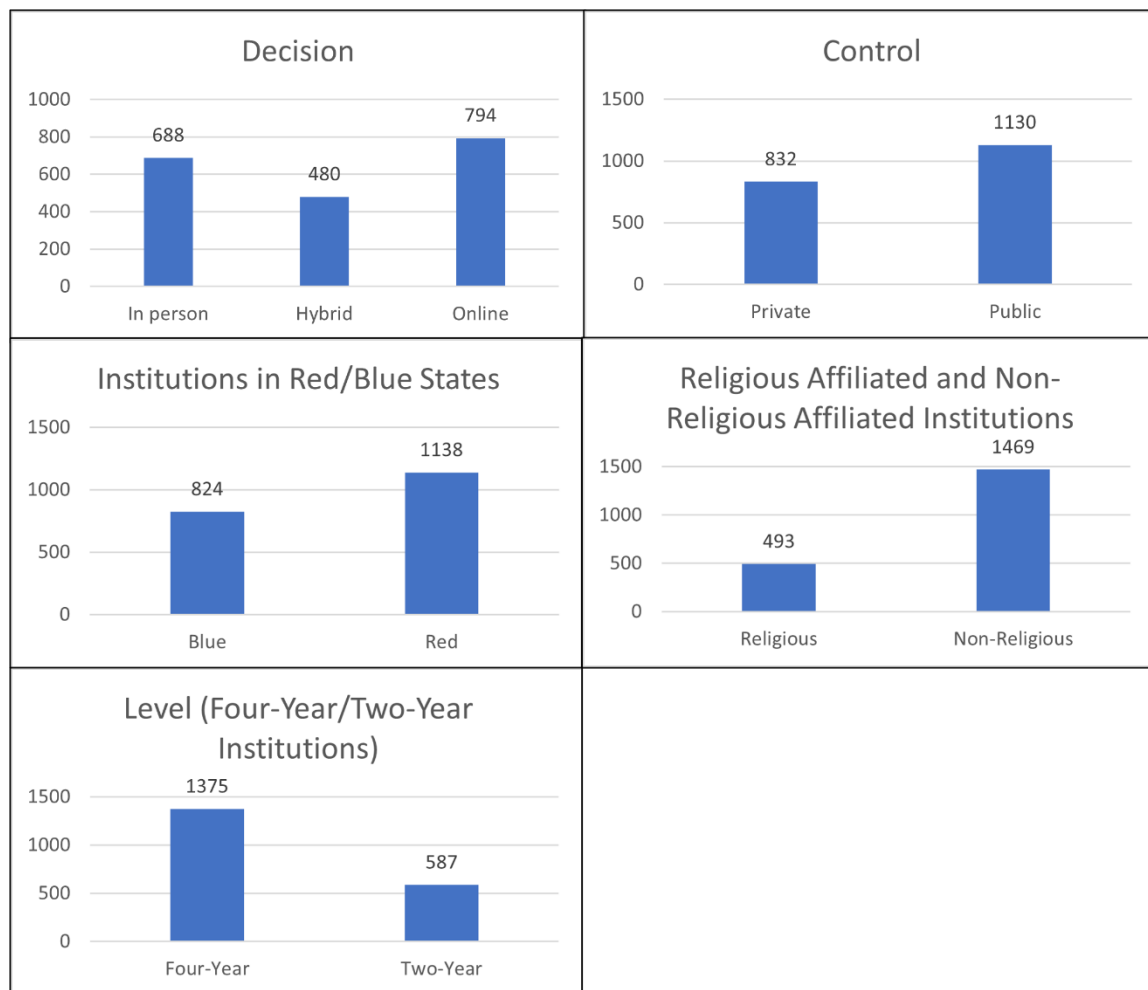


Figure 2. Bar Charts for the Categorical Variables in the Dataset

ANALYSIS AND DISCUSSION

BIVARIATE MODELS

CATEGORICAL EXPLANATORY VARIABLES

As a means of exploring the relationships between the potential explanatory variables and the decisions made by the institutions, we first explored the bivariate relationship between each variable and the decision. For categorical explanatory variables, we compared the proportion of institutions in each category that opted for in-person, hybrid and online.

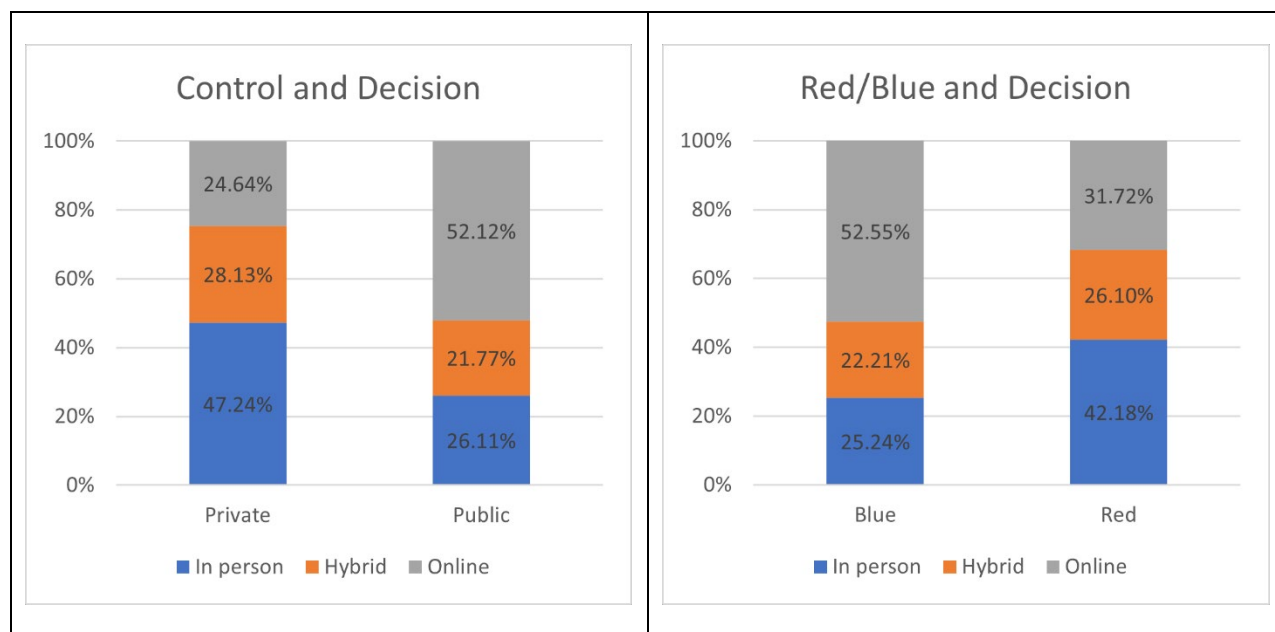


Figure 3. Impact of Control and Political Orientation on Decision

Examining the 100% stacked column chart for Control and Decision above (Figure 3), it appears that decision makers at private schools were more likely to choose the in-person option than decision makers at public schools. On the other hand, private schools were less likely to hold in-person or hybrid classes, than public schools. We tested the difference in proportions in all three cases (in-person, hybrid and online) and they were all statistically significant (Table 2). The direction of the results for in-person and online align with our hypotheses. For hybrid, we simply tested for equality.

Table 2. Test of Relationship Between Control and Decision

In-Person	Hybrid	Online
$H_0: p_{\text{private}} \leq p_{\text{public}}$	$H_0: p_{\text{private}} = p_{\text{public}}$	$H_0: p_{\text{private}} \geq p_{\text{public}}$
$H_a: p_{\text{private}} > p_{\text{public}}$	$H_a: p_{\text{private}} \neq p_{\text{public}}$	$H_a: p_{\text{private}} < p_{\text{public}}$
p-value: $< 2.2e - 16$	p-value: 0.001458	p-value: $< 2.2e - 16$

Looking at the data for red and blue states (Figure 3), it appears that institutions in blue states were less likely to choose in-person, less likely to choose hybrid, and more likely to choose online than those in red states. Again, these are consistent with our hypotheses. We tested these proportions and found the differences were significant for in-person and online, the modalities of interest (Table 3).

Table 3. Test of Relationship Between Political Orientation and Decision

In-Person	Hybrid	Online
$H_0: p_{\text{blue}} \leq p_{\text{red}}$	$H_0: p_{\text{blue}} = p_{\text{red}}$	$H_0: p_{\text{blue}} \geq p_{\text{red}}$
$H_a: p_{\text{blue}} > p_{\text{red}}$	$H_a: p_{\text{blue}} \neq p_{\text{red}}$	$H_a: p_{\text{blue}} < p_{\text{red}}$
p-value: $< 6.217e - 15$	p-value: 0.05424	p-value: $< 2.2e - 16$

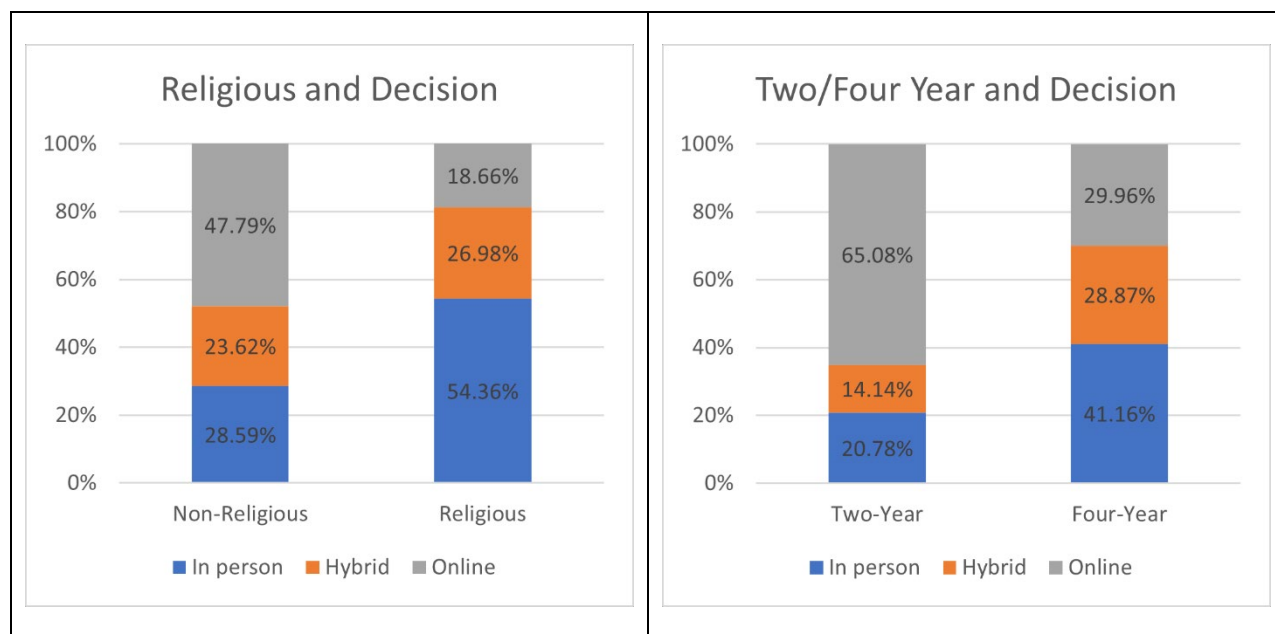


Figure 4. Impact of Religious Affiliation and Duration of Highest Degree Offered on Decision

As we expected Figure 4 shows that non-religious schools were less likely to offer classes in-person and more likely to offer classes online as compared with religious-affiliated institutions. These differences in proportion are significant (Table 4).

Table 4. Test of Relationship Between Religious Affiliation and Decision

In-Person	Hybrid	Online
$H_0: p_{\text{non-rel}} \geq p_{\text{rel}}$	$H_0: p_{\text{non-rel}} = p_{\text{rel}}$	$H_0: p_{\text{non-rel}} \leq p_{\text{rel}}$
$H_a: p_{\text{non-rel}} < p_{\text{rel}}$	$H_a: p_{\text{non-rel}} \neq p_{\text{rel}}$	$H_a: p_{\text{non-rel}} > p_{\text{rel}}$
p-value: $< 2.2e - 16$	p-value: 0.15	p-value: $< 2.2e - 16$

Two-year colleges were less likely to opt for in-person classes and more likely to go with online classes than four-year institutions (Figure 4), and the differences are statistically significant (Table 5).

Table 5. Test of Relationship Between Duration of Highest Degree Offered and Decision

In-Person	Hybrid	Online
$H_0: p_{2\text{-year}} \geq p_{4\text{-year}}$	$H_0: p_{2\text{-year}} = p_{4\text{-year}}$	$H_0: p_{2\text{-year}} \leq p_{4\text{-year}}$
$H_a: p_{2\text{-year}} < p_{4\text{-year}}$	$H_a: p_{2\text{-year}} \neq p_{4\text{-year}}$	$H_a: p_{2\text{-year}} > p_{4\text{-year}}$
p-value: $6.184e - 08$	p-value: $1.195e - 08$	p-value: $< 2.2e - 16$

As noted previously, almost all two-year schools are public. If we do the same comparison of two and four-year institutions but use only public schools, we see the same general results and all three null hypotheses are again strongly rejected.

NUMERICAL EXPLANATORY VARIABLES

For continuous explanatory variables we developed simple multinomial logistic regression models. While logistic regression models are used to predict binary outcome variables, multinomial logistic regression extends this notion to multiple-valued outcome variables, where the log odds of the outcomes are modeled as a linear combination of the predictor variables (Hosmer, Lemeshow, & Sturdivant, 2013; Agresti, 2019). Given our three-valued outcome variable, we used multinomial logistic regression.

In this section we consider only bivariate models with teaching modality as the dependent variable in each case. These models enable us to plot the predicted probabilities as a function of the explanatory variable in the same way a simple linear regression model enables us to plot predicted values of the dependent variable vs. the independent variable.

Figure 5 shows that, as Financial GPA increases, the probability of in-person teaching decreases, the probability of hybrid increases, and the probability of online increases. Setting in-person teaching as the baseline, we found that online was statistically significant ($p < 0.01$) as was hybrid (though only at the 0.1 level). In each of the subsequent figures in this section, we show the p-values of the coefficients with respect to the in-person modality.

Based upon our hypotheses, we created bivariate models for other explanatory variables. Figure 6 through Figure 11 show the charts, p values and number of observations. These analyses enable us to make the following conclusions:

Variables associated with school reputation/quality/financial strength, like financial GPA (Figure 5), admission rate (Figure 6), mean SAT score (Figure 7), US News ranking (Figure 8), average faculty salary (Figure 9) are related to the teaching modality decision. As these values go in the direction of greater reputation/quality/ financial strength, the probabilities of online and hybrid delivery increase, while the probability of in-person delivery decreases. In each of these cases, the explanatory variable is statistically significant.

The chart for the number of local COVID-19 cases per 100,000 county residents (Figure 10) and FY 2019 Total Endowment (Figure 11) indicate that as each variable increases, the probability of online increases and in-person decreases. In these cases, the coefficient for on-line modality is statistically significant, but that for hybrid modality is not.

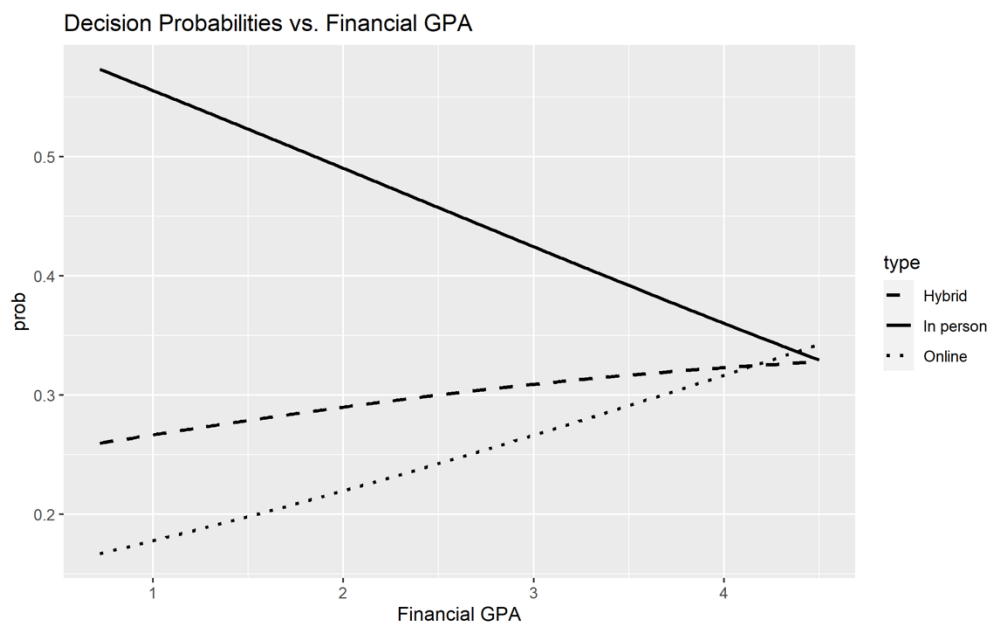
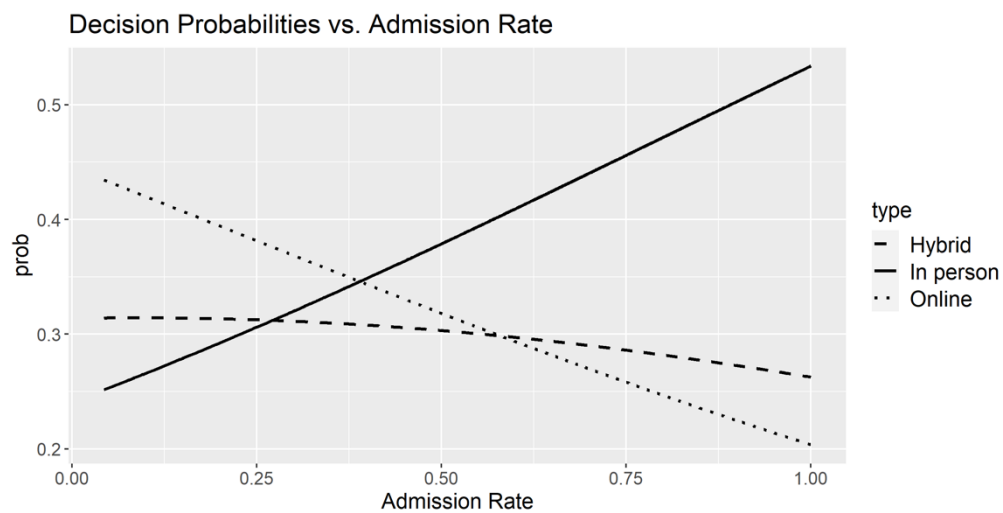


Figure 5. Effect of Financial GPA on Decision Probabilities



n = 1223 p-values: Hybrid 0.0049, Online 0.0000

Figure 6. Effect of Admission Rate on Decision Probabilities

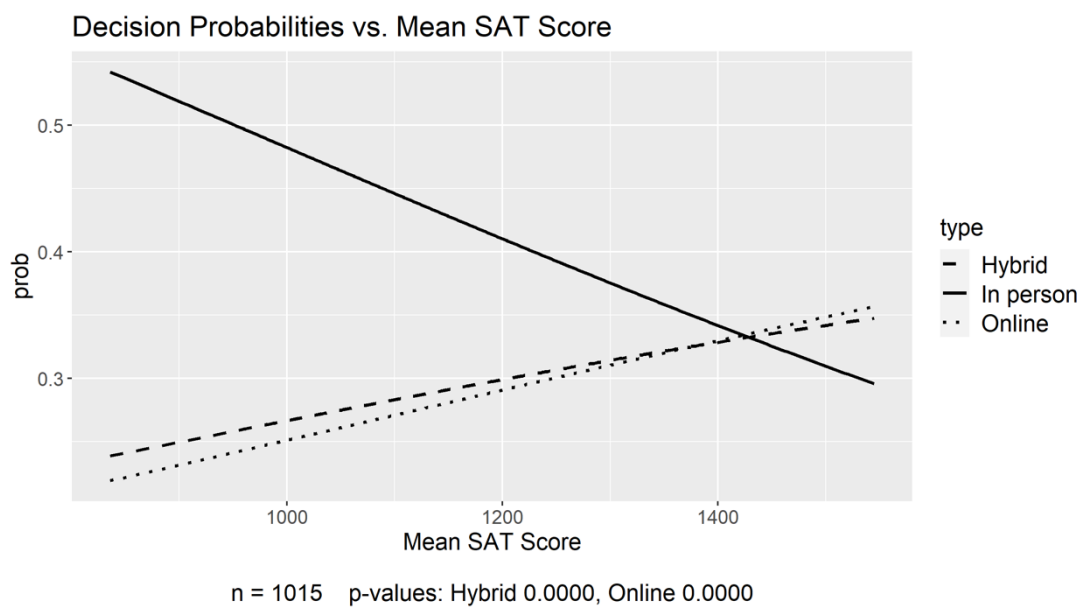


Figure 7. Effect of Mean SAT Score on Decision Probabilities

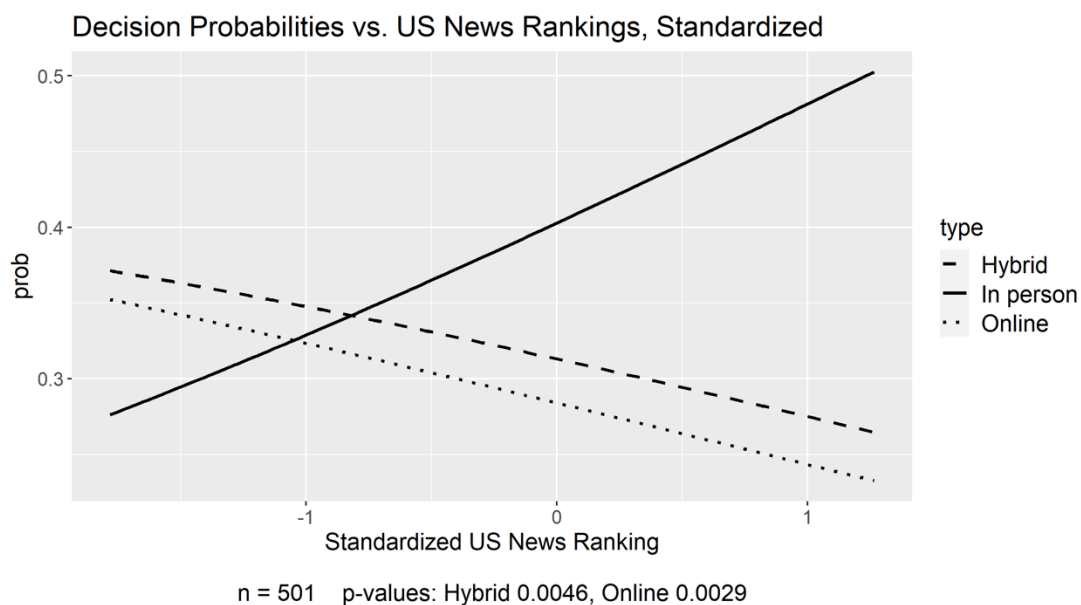


Figure 8. Effect of US News Rankings on Decision Probabilities

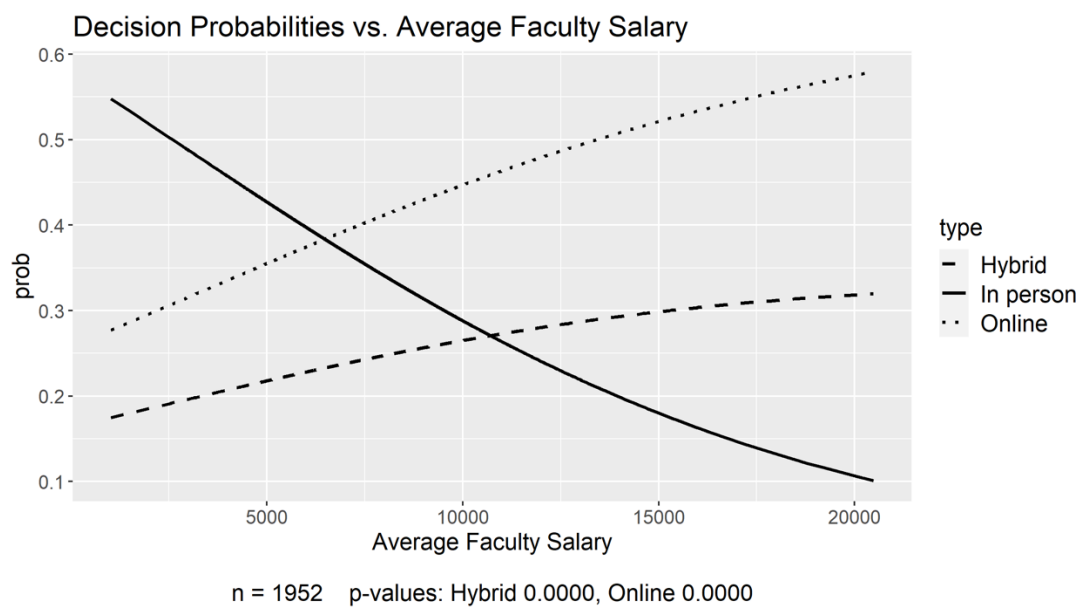


Figure 9. Effect of Average Faculty Salary on Decision Probabilities

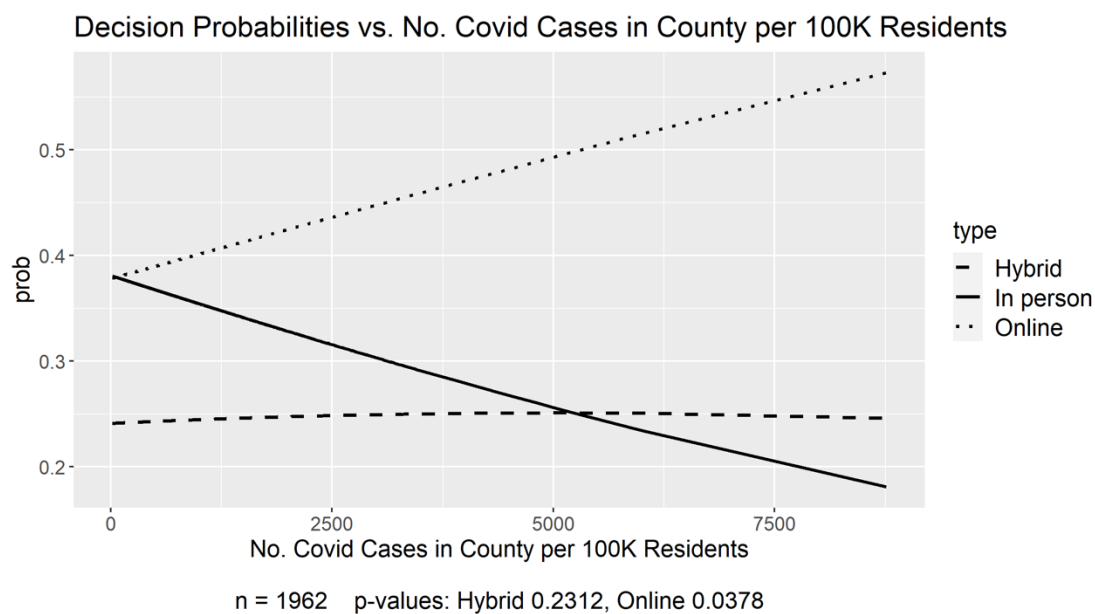
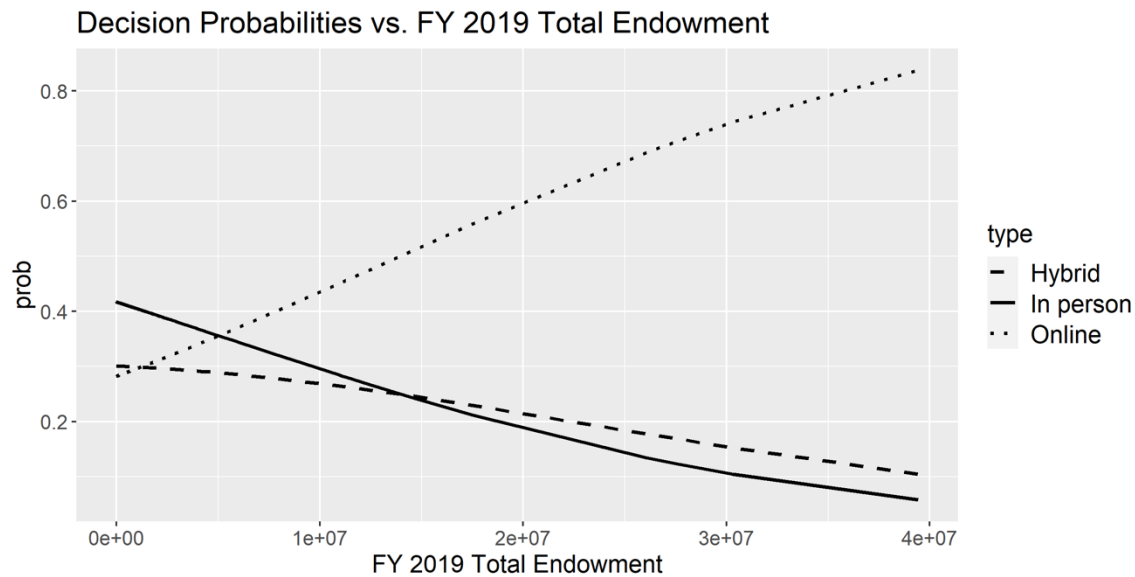


Figure 10. Effect of County COVID-19 Incidence on Decision Probabilities



n = 587 p-values: Hybrid 0.6074, Online 0.0452

Figure 11. Effect of Endowment on Decision Probabilities

MULTIVARIATE MODELS

We built a multivariate multinomial logistic regression model with the three-way decision (in-person, hybrid and online) as the dependent variable. We began with a model that included the variables (shown in Table 6) related to each of our hypotheses. We could not include any variable to represent the university level (2-year/4-year) because the restricted dataset with 1221 rows that we used with non-missing values for all the other variables used contained only 16 cases of 2-year universities. We were therefore unable to test hypothesis 7 in our multivariate model.

Table 6. Hypotheses and Corresponding Variables Used in The Multivariate Model

Hypothesis Number	Relevant Independent Variable	Variable Used in Model
1	Financial strength	Since we had only 699 rows for financial GPA, we used the average faculty salary as a surrogate -- this has a high correlation with financial GPA (Table 7) and has data for 1221 rows.
2	Selectivity	Admission rate
3	Public or private	Control (two-valued variable with values "Public" or "Private")
4	Political affiliation	Red_blue (two-valued variable with values "Red" or "Blue")
5	Religious affiliation	Rel_or_not (two-valued variable 0: Not affiliated or 1:affiliated)
6	COVID rate	County_cases_per_100k_residents
8	Humanities degrees %	Computed by summing up the percentage of degrees offered by each university in fields related to humanities. (See appendix)

Table 7. Correlations Between Some of The Numeric Variables

	Admission Rate	Mean SAT Score	Financial GPA	County Cases per 100K Residents	US News Ranking – Standardized	Average Faculty Salary	FY 2019 Total Endowment
Mean SAT Score	-0.50						
Financial GPA	-0.60	0.70					
County Cases per 100K Residents	-0.09	0.03	0.02				
US News Ranking – Standardized	0.69	-0.88	-0.76	-0.01			
Average Faculty Salary	-0.40	0.72	0.62	0.11	-0.78		
FY 2019 Total Endowment	-0.45	0.48	0.48	0.05	-0.40	0.61	
Percent Humanities Degrees	-0.19	0.17	0.32	0.04	-0.28	0.08	0.09

In the initial model with all of the variables from Table 6, COVID rate was not a statistically significant predictor, and we rebuilt the model without this variable. Cognizant of the potential pitfalls of stepwise regression, we were watchful for any drastic changes in the coefficients as a result of this step. However, no such changes occurred. Our final model had the following predictors with all being statistically significant:

- Financial strength (represented by its surrogate average faculty salary)
- Selectivity as measured by admissions rate
- Public or private
- Political affiliation of state
- Whether religiously affiliated
- Percentage of humanities degrees offered

Table 8 shows the results of the multinomial logistic regression. The regression coefficients represent the change in log odds per unit change in each variable and are hard to interpret. We therefore present an example case and show how the predicted probabilities change for a change in each variable. Table 9 shows the base case we consider for examining the multinomial regression coefficients.

To study how changes in each independent variable affect the probabilities of each of the delivery modes, we kept all independent variables at the base level and computed the probabilities for each delivery mode when just a single independent variable was changed from the base level by a specified amount.

Table 8. Results of Multinomial Logistic Regression

	Dependent Variable	
	Hybrid	Online
Control -- Public	0.275 **	0.635 ***
Humanities Degrees Percent	0.537 ***	-0.242 ***
Red/Blue -- Red	-0.201 ***	-0.714 ***
Religious	-0.098 ***	-0.400 ***
Admission Rate	-0.565 ***	-1.483 ***
Average Faculty Salary	0.0001 ***	0.0001 ***
Constant	-0.908 ***	0.366 ***
Akaike Information Criterion	2548.732	2548.732

Note: * $p < 0.1$ ** $p < 0.05$ *** $p < 0.001$

Table 9. Base Case for Interpreting Logistic Regression Coefficients

Decision	Control	Humanities Degrees %	Political Affiliation	Religious Affiliation	Admission Rate	Average Faculty Salary
In-person	Private	0.4468	Red	Yes	0.5666	7688

Figure 12 shows the results. Appendix C shows the full table of probabilities. The results show that all the movements in the probabilities align with our hypotheses. The coefficients corresponding to these independent variables are all statistically significant at a level much higher than 99.99%, with a p-value less than 0.0001.

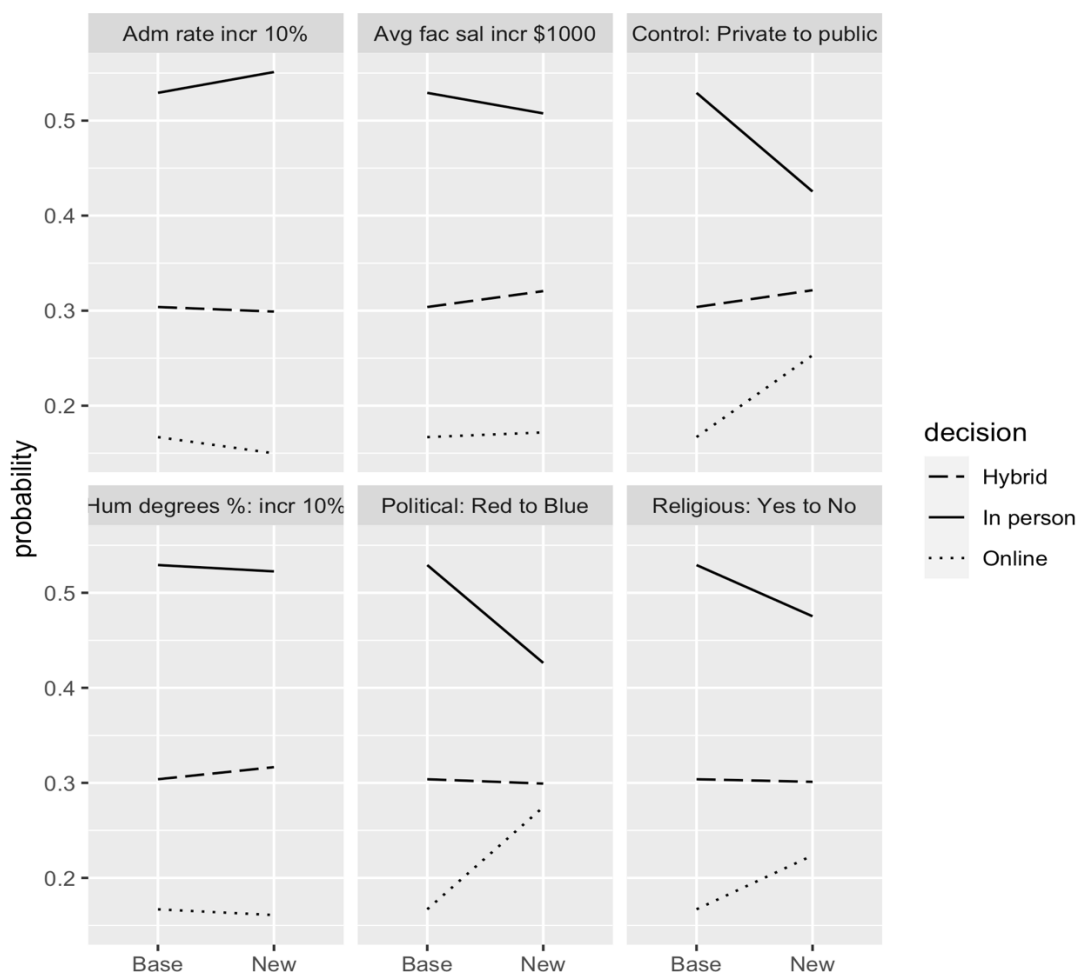


Figure 12. Change in Probabilities for Specific Changes in Independent Variables

ANALYSIS OF THE RESULTS OF THE MULTIVARIATE MODEL

We proposed eight hypotheses.

- Three of our hypotheses (relating to financial strength, selectivity and control) aligned closely with universities' immediate concerns with survival. We found each of them to be a statistically significant determinant of the reopening decision.
- The model confirmed our hypotheses relating to the impact of political and religious affiliation – that schools in Republican-leaning states and schools that were religiously affiliated would both be more likely to choose the In-person modality.
- Interestingly, our model was unable to confirm our hypothesis that schools located in areas that had a higher COVID infection rate would be more likely to choose the online delivery

modality. This implies that concerns of survival, political and religious factors outweighed scientific wisdom.

- Although our bivariate analysis showed support for our hypothesis that two-year colleges would be more likely to choose the online option, a paucity of data precluded us from testing this more rigorously through our multivariate model.
- The analysis confirmed our hypothesis that schools offering a greater proportion of humanities degrees would be more likely to choose the in-person modality.

Unlike linear regression, logistic regression does not have a direct measure for R-squared. Researchers often use the McFadden pseudo R-squared instead (Veall & Zimmerman, 1994). Unlike R-squared values from OLS, McFadden's pseudo r-squared values are generally lower and values between 0.2 and 0.4 are considered to be excellent for bivariate logistic regression (McFadden, 1977).

The above model has a McFadden pseudo r-squared value of 0.04. Even considering that our dependent variable is trivariate, we expect the model to have limited explanatory power.

We did a leave-one-out cross-validation procedure. We first considered the first case in the dataset as training (out-of-sample) and built a model with the remaining 1220 cases. We then used the model to make a prediction for the first case. We repeated this process by treating in turn each of the 1,221 cases as out-of-sample and building a model with the remaining 1220 cases and making a prediction for the out-of-sample case. We thus got a model prediction for each of the 1,221 cases. Table 10 shows the resulting classification confusion matrix.

Table 10. Classification-Confusion Matrix for The Multivariate Model

	Predicted		
	In-Person	Hybrid	Online
Actual			
In-Person	430	17	78
Hybrid	254	16	84
Online	199	20	123

The model's predictive power is very good for the in-person modality and significantly lower for the online modality. The model tends to classify most of the cases of the hybrid modality as in-person.

CONCLUSIONS

What explains the universities' choices as of summer 2020 for their instruction-delivery modality for fall 2020?

We proposed eight hypotheses: our analysis confirmed six of them, could not confirm a seventh and we were unable to rigorously test one although a direct bivariate analysis did show strong evidence for it.

Our observational research -- consistent with the expectations of the theory surrounding the CSR Pyramid -- attests to the pivotal role of a calculus of organizational survival. The pandemic confronted universities with serious financial challenges, and in some cases, a possible existential crisis. Our research indicates that those institutions most susceptible to the impact of lost enrollments were more likely to opt for in-person delivery.

Our results indicating that religious institutions and those in red states were more likely to teach in-person may be interpreted as those institutions acting in a way they deemed “right, just, and fair” and hence aligning with the Ethical Responsibilities of the CSR Pyramid.

The local COVID-19 rate was not a significant factor in our multivariate analysis. Our sense is that this factor was simply outweighed by other considerations.

The occurrence of systematic regularities in this decision with similar organizations making similar decisions – political affiliation of the states in which universities are located, whether or not they were religiously affiliated, and the percentage of humanities degrees offered – confirms that organizational isomorphism was at play as well.

While the CSR Pyramid states that a for-profit organization’s greatest emphasis is placed on economic responsibilities, one might think that in a situation where significant health concerns are a factor, non-profits would err on the side of safety over profit. Our results indicate that was not the case.

In addition, the results we calculated came from a large and diverse data set. Almost half the universities in the U.S. (1,962 out of 4,298) were included and they vary in many characteristics such as size, location and control to name a few.

As the COVID crisis shows, environmental threats sometimes challenge many organizations to make decisions that instrumentally affect their own survival, and also have serious effects well beyond their own boundaries. Viewing such decisions, which sometimes have life and death implications, as the sole prerogative of individual organizations seems untenable and meta-organizational approaches might be more suitable. As the phenomenon of “tragedy of the commons” (Hardin, 2009) shows, organizations tend to act in ways that prioritize their own profits even when deleterious global effects are obvious.

As fall 2021 rolls around and COVID-19 remains problematic, organizations are again facing the issue of whether to open in normal mode or continue remote operations and, if they do choose the former, what sort of mask and inoculation requirements to impose. The very same trade-offs that we explore in this study for fall 2020 are in play for fall 2021. One argument supporting our contention that organizations prioritize their self-interest in decision making is August 2021 data indicating that only a small percentage of colleges and universities are requiring vaccines of at least some students or employees (Thomason & O’Leary, 2021). Related to our hypothesis 4 (universities in red states are more likely to have opted for in-person delivery), politics is evidently playing a role in requirements for vaccinations and mask wearing, and prohibitions on requiring vaccinations and masks; likewise state-wide COVID-19 rates do not seem to be highly correlated with university COVID-19 safety policies (Thomason & O’Leary 2021; Solender, 2021; Wilson, 2021). Looking past the near-term, we believe our results will be applicable years from now, under similar circumstances.

Our findings on universities’ decision priorities indicate the need for theory and practical guidance on suitable approaches to manage such meta-organizational decision situations. We see significant scope for further research. A follow-up study of what universities actually did, as opposed to what they planned, could further enhance our understanding of decision-making under crisis. Cluster analysis can shed even greater light on organizational isomorphism, and it might also be interesting to tease out the specific mechanisms of isomorphism that were in play and what factors determined the particular isomorphic mechanism that a university adopted. We are also interested in examining the actual financial impact on universities.

In this analysis we took a traditional approach in that we relied on previous research to point the way towards relevant independent variables. Generalizing on the cluster analysis cited just above, a worthwhile next step would be to utilize data mining approaches on the full data set to explore relevant variables that may have not been included in this research.

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APPENDICES

APPENDIX A: DATA PREPARATION

The main information relating to college reopening plans came from The Chronicle of Higher Education as of August 4, 2020. They gathered the data pertaining to the reopening plans of various educational institutions by setting up a web site for representatives of the institutions to self-report. The Chronicle of Higher Education/Davidson Institute data categorized the reopening plans of universities like this: Fully in-person, Fully online (no students on campus), Fully online (some students on campus), Hybrid, Primarily in-person, Primarily online, TBD and Other.

Since the last two categories would not be useful in analysis of the drivers of the decision to hold classes primarily online or primarily on campus, we eliminated those rows from further consideration. We were left with a dataset containing 1962 rows, which is certainly a representative sample of the universities in the country.

APPENDIX B: COMPUTATION OF PERCENTAGE OF HUMANITIES DEGREES

The College Scorecard data reports the percentage of degrees offered by universities in various subject areas. We arrived at the percentage of humanities degrees by aggregating the percentage of degrees offered in the following areas (these are non-overlapping in the College Scorecard database, even though the labels might seem to indicate otherwise):

- Ethnic, Cultural, Gender, and Group Studies
- Communication, Journalism, and Related Programs
- Foreign Languages, Literatures, and Linguistics
- English Language and Literature/Letters
- Liberal Arts and Sciences, General Studies and Humanities
- Philosophy and Religious Studies
- Theology and Religious Vocations
- Psychology
- Social Sciences
- Visual and Performing Arts
- History

APPENDIX C: EXPLORATION OF THE MULTINOMIAL REGRESSION COEFFICIENTS

Table A1 shows the probabilities for each of the decisions under the base case and under specific changes in each of the predictors with the other remaining unchanged.

Table A1. Decision Variable Probabilities

Change	p(In-person)	p(Hybrid)	p(Online)	Interpretation
Base Case	0.5292194	0.3038312	0.1669494	-
Average Faculty Salary: Increase by \$1,000	0.5075949	0.3205689	0.1718363	Per hypothesis 1, as the financial strength increases, we expect the probability of online and hybrid to increase
Admission Rate: Increase by 10%	0.5511027	0.2990053	0.1498920	Per hypothesis 2, we expect that as selectivity decreases (admission rate increases), the probability of in-person will increase.
Admission Rate: Increase by 25%	0.5826860	0.2904393	0.1268748	
Control: Private to Public	0.4253706	0.3214877	0.2531417	Per hypothesis 3, a change from private to public control will increase the probability of going online.
Political Affiliation: Red to Blue	0.4262236	0.2992215	0.2745549	Per hypothesis 4, a change from Red to Blue should increase the probability of online.
Religious Affiliation: Yes to No	0.4752854	0.3010767	0.2236379	Per hypothesis 5, a change from religious affiliation to non-affiliation should increase the probability of online.
Humanities Degrees %: Increase by 10%	0.5225459	0.3165560	0.1608980	Per hypothesis 8, an increase in the percentage of humanities degrees offered should decrease the probability of online.
Humanities Degrees %: Increase by 25%	0.5118884	0.3361209	0.1519907	