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Test-Optional Policies: Implementation Impact on Undergraduate Admissions and Enrollment

Christina Pellegrino
cmpellegrino12@gmail.com

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Implementation Impact on Undergraduate Admissions and Enrollment

by

Christina Marie Pellegrino

Dissertation Committee
Robert Kelchen, Ph.D., Mentor
Daniel Gutmore, Ph.D., Member
Richard Blissett, Ph.D., Member

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APPROVAL FOR SUCCESSFUL DEFENSE

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DISSERTATION COMMITTEE
(please sign and date)

Dr. Robert Kelchen	11/7/2020
Mentor	**Date**
Dr. Daniel Gutmore	9/17/2020
Committee Member	**Date**
Dr. Richard Blissett	9/17/2020
Committee Member	**Date**

The mentor and any other committee members who wish to review revisions will sign and date this document only when revisions have been completed. Please return this form to the Office of Graduate Studies, where it will be placed in the candidate's file and submit a copy with your final dissertation to be bound as page number two.

Abstract

This study examines national colleges and universities that have de-emphasized or eliminated standardized test scores and have implemented test-optional policies for undergraduate admissions. The phrase “standardized test(s)” in this study refers to the ACT and the SAT examinations. The study investigates the test-optional admissions trend and provides a “pre-post" quantitative analysis of test-optional policy effects on the number of admitted students, applications, acceptance rates, and the enrollment of Pell Grant recipients and underrepresented minority groups. The study also includes a qualitative summative analysis pertaining to the institutional framing of test-optional policies. The quasi-experimental research design utilizes difference-in-differences regression of cross-sectional, time series (i.e., panel) data. The sample is comprised of U.S. national colleges and universities that have implemented a test-optional policy for first-year, full-time, undergraduate admissions in comparison to test-requiring institutions. The sample represents both public and private institutions, varying in enrollment, ranking, and acceptance rates. The study presents arguments from test-optional advocates and opponents, discusses theoretical frameworks, assesses previous research, and provides recommendations to the literature. It concludes with the findings, identification of limitations, and suggestions to prompt further study.

Keywords: test-optional policy, undergraduate admissions, enrollment, national universities, ACT, SAT, difference-in-differences

In Dedication

I dedicate this dissertation to my late grandparents, Rocco and Annunziata Mazza. My grandfather served his country in World War II and continued to serve his family, friends, and communities until his last breath. He came to the United States with exceptional determination to succeed, first as a stonemason and then as a business owner. He became a master of his trade and mentored many apprentices. He instilled respect, diligence, debate, inclusion, and generosity. He gave all those he encountered a strong foundation on which to prosper.

Alongside my grandfather was his beloved wife, my wonderful grandmother, Annunziata. For several years of her childhood, she experienced vision loss. During that time, she wanted nothing more than to read with her young peers. As her sight slowly returned, she learned to read from a large-print Bible. She relished every opportunity to learn new words, songs, and prayers. She spoke with sincerity, sang with exuberance, and prayed with conviction. She was a devout parishioner of churches in Italy and the U.S. She cared for and loved our family with every fiber of her being.

Papa, *spero che il paradiso abbia le tue cianografie perfetti, i mattoni di livello, e il cemento liscio. Spero che tu stia condividendo pane morbido e uva dolce con Nonna. Mi ricoderò per sempre le tue parole, "Nessuno ti corre appressò!" Spero di avervi reso orgogliosi. Riposate in pace eterna.*

(Papa, I hope heaven has your perfect blueprints, level bricks, and smooth concrete. I hope you are sharing soft bread and sweet grapes with Grandma. I will always remember your words, "*Nessuno ti corre appressò*!" I hope that I have made both of you proud. Rest in eternal peace.)

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A nod to these women: Annunziata, Maria, Antonia, Antionette, Lucia, Carol, Cathy, Maryann, Rosa, Phyllis, Elaine, Gina Marie, Angela, Nancy, Michele, Roxanne, Erica, Alyssa, Patrice, Yvette, Regina, Tracy, Amy, Michelle, Janis, Rosalie, and Laurie. *Hazard Zet Forward*.

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Chapter I: Introduction

The Movement to De-emphasize Standardized Testing

The ACT[1] and the SAT[2] have become a norm in the college admissions process as, to date, the majority of four-year U.S. colleges and universities require either the ACT or SAT for admissions (Maguire, 2018). In 2019, the ACT tested approximately 1.8 million students (ACT, 2019b) and the SAT tested over 2.2 million students (College Board, 2019b). According to the College Board, it was their highest number of students tested in a graduating class. Alongside the massive number of test-takers and many colleges that require the scores, there is a growing evolution to eliminate test scores from the college admissions criteria.

Traditionally, admission policies have relied heavily on performance-based factors such as ACT and SAT scores, high school grade point average (HSGPA), and the strength of high school curriculum, with moderate to limited consideration of other factors such as writing samples, extracurricular activities, class rank, admission interviews, and recommendation letters (National Association for College Admission Counseling [NACAC], 2019). Since the inception of the ACT and SAT (hereafter referred as ACT/SAT), there have been many debates regarding the validity, reliability, and appropriateness of using standardized test scores for college admissions (Geiser with Studley, 2002; Sackett & Kuncel, 2018; Soares, 2012). However, the debates have expanded beyond the use of testing to the discontinuation of testing. During the last decade, there has been a momentous shift to de-emphasize ACT/SAT scores for undergraduate admissions. The National Association for College Admission Counseling (NACAC), a member-

[1] The A.C.T. initialism originally stood for American College Testing. According to ACT Inc., now the test is simply called ACT. http://www.act.org/aboutact/history.html

[2] The S.A.T. initialism originally stood for Scholastic Aptitude Test, then later changed to Scholastic Assessment Test. According to the College Board, the initials do not have associated meaning and the test is simply called SAT. https://sat.collegeboard.org/home?navid=sat-satc

directed organization which provides expert admission advice and resources, published their annual State of College Admission report demonstrating strong evidence toward the de-emphasis of ACT/SAT scores (NACAC, 2019). In the most recent 2019 report, the large-scale study analyzed data from institutional research and admission offices of 447 four-year, degree-granting U.S. colleges and universities. The report's *Admission Trends Surveys* identified the percentage of institutions attributing "considerable importance" to performance-based admission factors on a longitudinal scale from 2007 through 2018. Two significant findings provided strong evidence for the de-emphasis of ACT/SAT scores: considerable importance of admission test scores has steadily declined from 59% to 46%, while considerable importance of grades in all courses has increased from 52% to 75% (NACAC, 2019). For several years, the annual NACAC study has clearly demonstrated the growing interest and consistent movement toward the de-emphasis of ACT/SAT test scores for admissions.

The National Center for Fair and Open Testing (FairTest) has provided advocacy for the de-emphasis and elimination of standardized testing in education since 1987. FairTest is an educational organization comprised of a small team of public policy and research analysts that provides data, resources, and publications regarding the test-optional movement. The FairTest organization is currently the sole provider of an updated test-optional database and is often referenced in the test-optional movement literature. For the academic year 2018–2019, the FairTest database reported that approximately 1,080 four-year U.S. colleges and universities either de-emphasized or eliminated standardized test scores for admissions (National Center for Fair & Open Testing, 2020a). To date, there are 2,828 four-year institutions in the U.S. (National Center for Education Statistics [NCES], 2019). However, approximately 300 of 1,080 institutions from the FairTest database are considered open-access institutions or have never used

standardized testing for admissions (College Board Communications, 2017). In addition, FairTest also reports that approximately 400 institutions from the database have ranked in top tiers of their respective categories in the *2020 U.S. News & World Report Best Colleges* (U.S. News Best Colleges) rankings. While the test-optional database demonstrates significant growth, several institutions on the list have conditional requirements for test-optional admissions. For example, although the University of Delaware provides test-optional admissions, it is an exclusive option for Delaware state residents. Institutions such as Duquesne University, George Mason University, and Pace University also offer test-optional admissions, but the policies are exclusive to select majors, academic thresholds, and credit requirements, respectively.

The test-optional movement includes a broad spectrum of institutions, from national and regional liberal arts colleges to national and regional universities. According to the FairTest database, test-optional growth has been constant. Since 2014, the number of national liberal arts colleges adopting test-optional policies increased 55% and the number of national universities nearly quadrupled. The types of test-optional policies implemented by the institutions also vary. Below and within the text of this study, test-optional admission policy terms are explained. Also, the variations within test-optional policy frameworks—theoretical and institutional—are identified in subsequent chapters.

Test-Optional Policies Defined

Broadly defined, the term "test-optional" is an admission policy that presents an option for first-year, full-time, undergraduate applicants to either submit or withhold ACT/SAT scores without penalty (University of San Francisco, 2020). Test-optional institutions have adopted a variety of frameworks to curtail or eliminate ACT/SAT scores for admissions (many with conditions such as academic thresholds, limited to specific applicants), or require alternative

application materials (Syverson, 2007). Test-optional policy conditions may include, but are not limited to, the submission of ACT/SAT scores for the following circumstances: first-year course placement or academic advising; merit scholarship applications, select majors, or academic programs (honors college or accelerated/dual degrees); applicants who are homeschooled, out-of-state, international, or English language learners (ELL); U.S. citizens living abroad who have attended international secondary schools; consideration when HSGPA or class rank does not meet the institutional minimum; eligibility index calculations (test scores, HSGPA, class rank, and strength of curriculum); applicants from high schools with narrative evaluations in lieu of letter grades or numeric HSGPAs; and applicants who have received a Certificate of High School Equivalency or similarly titled credential by passing the General Education Development tests (GED), High School Equivalency Test (HiSET), or Test Assessing Secondary Completion (TASC).

Additionally, test-optional policies may allow the omission of ACT/SAT scores if students supplement the application with writing samples, interviews, or non-cognitive tests. Scores may also be omitted if an applicant meets a specific academic threshold (HSGPA or class rank) for "assured, automatic, or guaranteed" admissions, such as in Texas House Bill 588, commonly known as the "Top 10% Rule." Some institutions report that they use voluntarily submitted scores only in the applicant's favor or for institutional purposes. As noted on the Wake Forest University test-optional webpage, "If you think your scores are an accurate representation of your ability, feel free to submit them. If you feel they are not, don't. You won't be penalized" (Wake Forest University, 2020).

The term "test-flexible" is another type of admission policy that allows applicants to choose—in lieu of the ACT/SAT—to submit alternate examination scores such as the College

Board's Advanced Placement (AP) exams, International Baccalaureate (IB) exams, SAT II Subject Tests, or other college-level assessments requested by the institution (Belasco et al., 2014). In addition to test-optional and test-flexible options, a "test-blind" admission policy indicates that an institution will not view or use standardized test scores, even if by voluntary submission (Loyola University New Orleans, 2020). Test-blind institutions were not included in the U.S. News Best Colleges rankings from 2008 to 2020; however, the formerly "unranked" test-blind institutions will be factored in future editions (Morse & Brooks, 2020). Other publications such as *College Factual, Forbes*, *Niche,* and *Washington Monthly* have included test-blind institutions in their public rankings.

The prevalence of test-blind admissions is pale in comparison to test-optional and test-flexible admissions. A brief history of test-blind admissions includes Sarah Lawrence College taking the lead in 2005, although the college returned to test-optional in 2012 (Jaschik, 2015). Two years later, Hampshire College introduced test-blind admissions and has continued to employ this policy (Jaschik, 2015). The Catholic University of America implemented test-optional admissions in 2015 and has transitioned to test-blind in 2020 for all undergraduate applicants (Catholic University, 2020). University of New England implemented a test-optional policy in 2019, and has announced their transition to a pilot test-blind program for future applicants (University of New England, 2020). Former test-requiring institutions Northern Illinois University and Loyola University, New Orleans will shift to test-blind admissions as well (Loyola University New Orleans, 2020; Northern Illinois University, 2020). The University of California system, comprised of ten campuses, plans to adopt a test-blind policy in 2023 for in-state applicants (University of California, Office of the President, 2020).

Just as the test-optional admission policies differ among institutions, the rationalizations and paths leading to test-optional policies also vary. The qualitative analysis section of this study includes further discussion of test-optional policy rationalization and framework variations.

Problem Statement

As of 2020, over 30% of four-year, degree-granting institutions across the nation have implemented test-optional policies for undergraduate admissions. Approximately 30 national universities and national liberal arts colleges on the test-optional list are highly selective, ranked in the top 50 of their respective categories (FairTest, 2020a). The continual growth of the test-optional movement has led to much debate from testing proponents and test-optional advocates. ACT/SAT proponents argue that standardized testing provides uniformity, validity, and neutrality when assessing prospective students for undergraduate admissions, whereas other admission factors—high school course offerings, rigor of courses, and grading systems—lack uniformity as they differ widely across U.S. secondary schools (Buckley et al., 2018).

Advocates in favor of the test-optional movement support holistic means for admissions and further argue that ACT/SAT score differences continue to persist among socioeconomic status (SES) subgroups, and claim that test-optional policies improve campus diversity by increasing the number of underrepresented minorities (URM) and low-income students (Buckley et al., 2018). Test-optional advocates also reference large-scale studies that indicate HSGPA predicts college GPA better than standardized admissions tests (Berry & Sackett, 2009; Kuncel et al., 2001). ACT/SAT proponents question the objectives of test-optional institutions, with claims that such policies increase the number of applications, attract media exposure, and improve institutional rankings by increasing admittance competition (Buckley et al., 2018).

The continual debates and growth of test-optional institutions present a need to examine the effects of test-optional policies compared to test-requiring policies for admissions. This research expands on a study by Belasco et al. (2014) that investigated test-optional policies and applied Merton's (2016) manifest and latent functions as a theoretical framework (theory discussed further in the section below). Belasco et al. (2014) sampled a total of 180 test-requiring and test-optional liberal arts colleges in the U.S. (32 institutions were test-optional) in a panel study spanning from 1992 to 2010. The researchers examined whether the de-emphasis or elimination of performance-based measures such as ACT/SAT improved diversity by reducing access inequalities for low SES and URM groups often disadvantaged by standardized testing (Belasco et al., 2014). They also investigated whether colleges experienced an increase or decrease in applications and reported ACT/SAT scores following the implementation of test-optional policies.

Their findings revealed that the test-optional group enrolled 21% low-income students, while the ACT/SAT test-requiring group enrolled 25%; the test-optional group enrolled 10% minority students, while the ACT/SAT test-requiring group enrolled 12%; and on average, the test-optional group received approximately 220 more applications and an increase of 26 points on reported SAT scores (Belasco et al., 2014). The researchers demonstrated that test-optional colleges experienced an increase applications and test scores, thus enhancing the perception of selectivity and quality (Belasco et al., 2014). The researchers reported that the changes following test-optional implementation did not expand educational opportunities for low SES and URM students, and inferred that test-optional policies may perpetuate inequalities (Belasco et al., 2014). This research made a strong contribution to the literature, as it provided a panel study with evidence of test-optional policy effects. The limitation of this study was the sample

population. It represented only selective liberal arts colleges and the treatment group institutions had undergraduate enrollment with less than 3,000 students.

The available literature does not include longitudinal studies on test-optional policies implemented by national research institutions compared to similarly profiled test-requiring institutions. Also, in the wake of current events such as the coronavirus disease 2019 (COVID-19) inducing a nationwide cancellation of testing and immediate transition to off-campus operations, test-optional research is a timely matter. Such information will provide admissions offices with alternative evaluation measures for unforeseen issues. As more institutions begin implementing test-optional policies, further investigation of national colleges and universities will fill a gap in the literature and will also serve as a resource for stakeholders considering test-optional admissions. Additional gaps in the test-optional literature include large-scale studies, comparable to the College Board's 2019 study (Westrick, et al., 2019). This research addressed the gap in literature by examining national institutions and the extent of their test-optional policy outcomes. It presented findings on institutions currently practicing test-optional policies, and serves as a useful tool for institutional stakeholders considering the implementation of test-optional policies.

Theoretical Basis for the Study

The theoretical framework for this study is based on Merton's 1957 manifest and latent functions of social action and follows the conceptual structure of Belasco et al. (2014). Regarding the test-optional movement, a manifest function is an intended and often publicized factor which motivates institutions to implement a test-optional policy. An example of a manifest function is to diversify the applicant pool and improve access to college, as publicized on several test-optional institutions' webpages. A latent function, unpublicized, may also motivate institutions to implement a test-optional policy. An example of a latent function is a potential

increase in the number of applicants that causes a decrease in the acceptance rates, thus exhibiting a more selective institution. This research examines test-optional motives in relation to Merton's manifest and latent functions.

As the data from the Belasco et al. (2014) study indicated, test-optional colleges fulfilled a latent function as they received more applications, a rise in reported SAT scores, and enhanced perception of selectivity. In response to the latent function of enhancing selectivity, U.S. News Best Colleges updated their ranking methodology to include a 15% reduction in their combined SAT/ACT percentile distribution value for colleges which report less than 75% of the entering class test scores (Morse & Brooks, 2020). In a case study featuring Ithaca College, the methodology reduction served as a rebuttal to critics suggesting a latent function, of which test-optional policies improve rankings through the reporting of only competitive test scores. The author suggested that the penalty offsets the possible increase in average SAT scores, and there is little to gain from rankings for top ten colleges in their respective categories (Maguire, 2018).

However, there continues to be much interest in rankings as the mere salience of publicized ranking information affects the number of applicants and college selection (Luca & Smith, 2013). The popularity of college rankings was made evident when the U.S. News website generated 2.6 million unique visitors and 18.9 million views with the release of their 2014 Best Colleges rankings (U.S. News & World Report, 2013). Alongside ranking popularity is criticism of the methodology and the influence on institutions to formulate admissions decisions and data reports that align with ranking components rather than individual applicants (Meredith, 2004).

While college rankings have existed for over a century and have become prominent references, a few institutions have recently adopted test-blind policies irrespective of rankings and test scores. Christopher Lydon, Catholic University's Vice President for Enrollment

Management and Marketing, noted, "Over the past five years, our refinements in the application review and the depth of experience on the admission staff have demonstrated that the Committee on Admission is able to make effective admission decisions regardless of whether a standardized test score is available" (Catholic University, 2020).

Hampshire College was test-optional for over 30 years before implementing a test-blind policy in 2014. After Hampshire College's first test-blind admissions cycle in 2015, the college reported success with the test-blind policy as the number of URM students increased from 26% to 31%, international students increased from 10% to 27%, the applicant yield increased from 18% to 26%, and the HSGPA of 3.5 remained the same. Interestingly, this increase in URM, international students, and yield took place while the number of applications decreased from 2,600 to 2,050 (Jaschik, 2015). Hampshire College, in contrast to the findings in Belasco et al. (2014), demonstrated that their motivation for test-blind admissions fulfilled a manifest function, as the diversity of the students and yield increased with a decrease in applicants. While Hampshire College demonstrated favorable results after their first test-blind cycle, the trend has not continued as they still struggle with enrollment. According to the Integrated Postsecondary Education Data System (IPEDS), Hampshire College has experienced a decline in applicants, URM enrollment, and total enrollment.

In 2018, the University of Chicago implemented a strategic initiative that included a test-optional policy, increased financial aid, and programmatic resources to "enhance the accessibility of its undergraduate College for first-generation and low-income students" (University of Chicago, 2020). The top-ranked national university stated that they will continue to follow a holistic review of applicants with steadfast commitment to access and inclusion. University of Chicago's initiative is comprehensive; however, should the university experience

an increase in applicants along with the submission of only competitive ACT/SAT scores as demonstrated in Belasco et al. (2014), the policy will further improve rankings for the highly selective university. Lower acceptance rates would then reinforce competition for the first-generation and low-income population, which the University of Chicago's test-optional admissions proposes to serve.

Evidence of manifest and latent functions, test-blind policy outcomes, and recent admissions changes coupled with the continual addition of test-optional schools are reasons to further the dialogue and build upon existing research.

Purpose of the Study

The purpose of this study was to provide qualitative and quantitative analyses of test-optional policy implementation in national colleges and universities. The qualitative research investigated the frameworks and rationalizations of such policies. The quantitative research included a "pre-post" analysis of institutions in the U.S. that adopted test-optional policies for admissions, and the impact of such change compared to test-requiring institutions. The sample of undergraduate national institutions was selected from the 2020 U.S. News Best Colleges report, ranked in the top 75% "National Universities" category, hereafter called "top tier." The quantitative research used difference-in-differences (DD), a quasi-experimental statistical technique, to determine the extent of test-optional admission policies' impact on the number of admitted first-year, full-time students; the number of applicants; institutional acceptance rates; and the enrollment of Pell Grant recipients and URM students. The URM population examined in this research are persons who belong to or identify as the following races and ethnicities as reported to IPEDS: American Indian or Alaska Native, Black or African American, Hispanic or Latino, Native Hawaiian or Other Pacific Islander, and those reporting more than one race.

The first research question employed qualitative analysis, and the subsequent questions required quantitative analysis. The research questions and hypotheses for this study were as follows:

Research Questions and Hypotheses

1) How do institutions rationalize their test-optional policies?
2) To what extent does test-optional policy implementation affect the number of admitted students and applications?
    a. How are institutional acceptance rates affected?
3) To what extent does test-optional policy implementation affect the enrollment of Pell Grant recipients and underrepresented minority students?

While there is much literature on the advantages and disadvantages of test-optional policies, there is limited literature on the effect of test-optional implementation with national colleges and universities as the sample population. This study addressed this literature gap and expanded on the existing research. The data from this research may assist higher education stakeholders with framing or revising test-optional policies. The data may serve as a timely resource for test-optional advocates, challengers, admissions representatives, prospective students, and those participating in higher education policy evaluation and implementation.

The hypothesis for the quantitative analysis is that test-optional policy implementation increases applicant pools, but with no significant increases in URM student and Pell Grant recipient enrollment. As a result of increased applicant pools, I propose that test-optional policy implementation simultaneously decreases the institutional acceptance rates. In reference to the theoretical framework, I propose a greater fulfillment of Merton's latent function when compared to the manifest function, demonstrating results similar to those reported in Belasco et al. (2014) and Sweitzer, Blalock, and Sharma (2018).

Structure of the Study

This study presents five chapters, with the preceding introduction serving as the first chapter. The second chapter provides historical reference and relevant literature on the potential advantages and disadvantages of test-optional implementation, augmentation of test scores for admissions, and the financial implications of and rebuttals to the ACT/SAT industry. The third chapter discusses the methods used for the sample selection of institutions and data collection. Chapter III also details the research design for the qualitative and quantitative analyses. The fourth chapter presents the analyses and results for the qualitative and quantitative research questions. Lastly, the fifth chapter provides a summary, explanation of the findings, limitations of the study, and recommendations for future research.

Chapter II: Background: Brief History of College Admissions Testing and the Test-Optional Evolution

In 1900, the College Entrance Examination Board (presently the College Board), was responsible for the design and implementation of common entrance examinations for college admissions (White, 2015). The College Board was comprised of voluntary members from 12 northeastern universities and three secondary schools (College Entrance Examination Board of the Middle States and Maryland [CEEB], 1900). The purpose of the College Board was to establish uniformity and organization between secondary school curriculum and college admissions (CEEB, 1900). The College Board developed course requirements and a list of curriculum-based written tests in several content areas: English, Latin, Greek, French, German, history, mathematics, physics, chemistry, botany, and zoology (CEEB, 1900).

The design of college entrance exams changed in 1916 to include greater emphasis on problem solving and critical thinking (White, 2015). College entrance testing was revised again after World War I as an adaptation to military intelligence and psychological tests, and became the College Board's first psychological exam with multiple-choice questions called the Scholastic Aptitude Test (White, 2015). The exam name later changed to the Scholastic Achievement Test, and is now simply called the SAT. The structure of the SAT has been everchanging with revisions to the questioning and scoring system, and recently granting the use of scientific and (most) graphing calculators. Presently, the SAT is comprised of evidence-based, multiple-choice questions in reading, writing, and language, and a math test of mostly multiple-choice and some student-produced responses called "grid-ins" (College Board, 2020b).

As the College Board's standardized testing increased in popularity from the first exam testing 973 students to testing over half a million students by the 1950s, the SAT also gained a competitor (Maguire, 2018). In 1959, Professor Everett Franklin Lindquist and Registrar Ted

McCarrel from the University of Iowa established the American College Testing service (ACT), an alternative philosophy of admissions testing that focused on achievement rather than intelligence (Atkinson & Geiser, 2009). The early version of the ACT was closely related to Iowa's high school standards and curriculum, and the Iowa Tests of Educational Development which included English, mathematics, natural sciences reading, and social studies reading (Atkinson & Geiser, 2009). In 1989, the ACT revised the content based on national standards and curriculum surveys into four subject areas with multiple-choice questions: English, mathematics, reading, and science, with an optional writing exam added in 2005. Despite the ACT's attempt at providing an alternative exam, it is similar to the SAT as they are both norm-referenced tests with nearly the same bell curve distributions (Atkinson & Geiser, 2009).

The ACT and SAT became widely used by U.S. students and institutions after the 1960s with millions of test-takers annually (Kinzie et al., 2004). In 1968, the SAT secured a significant client, the University of California (UC), as they began requiring SAT and SAT II Subject Test scores, with the goal of reducing their eligibility pool. John Grant, (then) chair of the UC Board of Admissions and Relations with Schools (UCBOARS) wrote, "All of our studies indicate that the best single predictor of academic success in college is a satisfactory grade-point record … but that the addition of test scores will yield a statistically significant improvement in predictability. In addition, their use would tend to reduce the inequities resulting from differences among school marking systems, and thus would be in the interest of the applicant" (University of California Board of Admissions and Relations with Schools [UCBOARS], 2002). UC continued to revise this policy throughout subsequent decades, to include the creation of an "eligibility index" which specified a sliding scale, and the option of submitting ACT scores in lieu of SAT scores (UCBOARS, 2002).

While the testing industry continued to grow with large clients such as UC, the test-optional movement also began to take shape in 1969 when the highly selective Bowdoin College eliminated the SAT from their admission requirements, followed by the selective Bates College in 1984 (Lucido, 2018). The test-optional movement continued to expand in the 1990s, as several small selective schools including Smith College, Bryn Mawr College, and the College of the Holy Cross eliminated ACT/SAT scores (Lucido, 2018). During this time, FairTest served as a strong advocate for a broad range of testing concerns and in 1987 began chronicling test-optional institutions in their newsletters. The test-optional movement gained momentum in 2001, as once again UC's (then) President Richard Atkinson shifted gears at an annual American Council on Education meeting where he discussed the over-reliance on the SAT (designed to assess aptitude and intelligence) and recommended curriculum-based tests such as SAT II Subject Tests, designed to measure mastery of college-preparatory subjects (Atkinson, 2004). Alongside Atkinson's position, UCBOARS reviewed an institutional study by Geiser with Studley (2002) with nearly 78,000 records of admitted UC students from 1996 to 1999. UCBOARS concluded that overall, the SAT II was a better predictor of UC freshman grades compared to the SAT; HSGPA in college-preparatory classes was the best predictor of first-year grades at UC; test scores were significant predictors when combined with HSGPA; and neither the SAT nor SAT II provided significant evidence in predicting performance of low SES or demographic groups (UCBOARS, 2002).

Also contributing to the test-optional momentum was a study presented in 2004 by William Hiss, a former vice president of Bates College, which found that overall GPAs and graduation rates at Bates for test submitters and non-submitters were of negligible difference. Hiss also reported that Bates' enrollment of students of color and international students increased

due to their test-optional program (Hiss & Franks, 2014; Lucido, 2018). Further, Geiser and Santelices (2007) expanded on the UC institutional research of Geiser with Studley (2002), confirming that HSGPA was the strongest predictor of four-year outcomes for all students in the UC sample and that HSGPA had a less adverse impact than admissions tests on disadvantaged and URM students. Amid these studies, the test-optional movement evolved, as documented by the FairTest database from 2005 to 2020 chronicling more than 1,080 test-optional institutions.

In response to the COVID-19 pandemic occurring at the time of this study, the ACT and College Board cancelled testing from March to June 2020, with future testing dates to be determined. As a result, approximately 70 test-requiring U.S. institutions suspended the use of ACT/SAT scores for summer and fall 2020 admission cycles (National Center for Fair & Open Testing, 2020b). In addition to the temporary test score suspension, on May 21, 2020 UC's Board of Regents approved phases to eliminate the ACT/SAT for future admissions. They will begin with implementing a test-optional policy for 2021–2022, then transition to a test-blind policy for 2023–2024, with a final shift to eliminate the ACT/SAT for 2025. The new UC admission policies currently apply to California resident students; however, UC will address testing options for nonresident and international students in 2025. During these policy phases, UC plans to identify or move toward creating a new college readiness test (University of California, Office of the President, 2020).

Along with the changes to standardized testing and the expansion of admissions requirement options, many stakeholders have voiced both the advantages and disadvantages of test-optional policies as well as methods to augment the use of standardized testing for admissions. The section below identifies such debate and reflection from academic associations, educators, higher education administrators, and the ACT and SAT corporations.

Potential Advantages of Test-Optional Policies

The rise in the number of test-optional institutions has led to greater interest in the dialogue and study of this movement. Over the last 15 years, FairTest has provided a useful database which includes chronological, alphabetical, and geographical lists of test-optional colleges and universities. As seen in the database, the number of test-optional institutions has grown exponentially, from showing only a nominal group of test-optional institutions in 2005 to currently over 1,080 test-optional institutions. The movement has also become a subject of conversation across forums from academic journals to global publications such as *Forbes* (Nietzel, 2019) and as a #testoptional hashtag on Twitter.[3] In much of this literature and dialogue, those in favor of the test-optional movement reference the misuse of standardized testing in admissions and how ACT/SAT score differences continue to persist among SES subgroups. Test-optional advocates claim that the objective of test-optional admissions is to improve campus diversity by increasing the number of URM and low-income students. Also, a common test-optional objective is to convey to applicants that the most valuable preparation for college is the high school academic foundation (Cortes, 2013).

In October 1984, Bates College became one of the first selective colleges to adopt a test-optional policy; their results have been referenced in a Bates-conducted study, *Defining Promise: Twenty-five Years of Optional Testing at Bates College, 1984–2009* (Hiss & Doria, 2011). In the evaluation, Bates reported that test submitters and non-submitters had nearly identical college GPAs and graduation rates, although non-submitters scored an average of 160 points lower on the SAT than submitters (Hiss & Doria, 2011). The researchers also reported that more than half of Hispanic, Black, and grant-eligible applicants were non-submitters (Hiss & Doria, 2011).

[3] https://twitter.com/hashtag/testoptional

Presently, Bates College reports that 24% of their students are from URM groups (Bates College, 2020). The *U.S. News & World Report* Campus Ethnic Diversity report factors the total proportion of minority students (excluding international students) for each institution and formulates a diversity index from 0 to 1—least to most—diverse campus (U.S. News & World Report, 2020). According to the diversity ranking, Bates has a diversity formula index of .39 (highest in the category is .75; lowest .002).[4] The index for Bates is above the mean for the "National Liberal Arts" campus diversity category (U.S. News & World Report, 2020). The submission of test scores for Bates remains optional; however, non-submitters are required to submit their scores after enrollment for the purpose of evaluation studies (Bates College, 2020).

In a case study featuring Ithaca College and Franklin & Marshall College (F&M), the researcher (former chief enrollment officer for both institutions) reported similar test-optional success. The study demonstrated that during Ithaca's first two years of test-optional admissions between 2012 and 2014, they experienced a 31.8% increase in total applications and a 66% increase within their URM applicant subgroup. After their fourth test-optional year, they reported a 32% increase in URM enrollment (Maguire, 2018). The researcher noted that the increase in applications was anticipated and welcomed, as it aligned with the strategic plans to expand Ithaca's applicant pool beyond the Northeast and (at both institutions) to attract a larger number of URM students (Maguire, 2018).

F&M's case study was slightly different from Ithaca's study. F&M implemented a test-optional policy in 1992 with modest success initially, then sought policy revisions in 2007 to expand their reach. In the process, they removed HSGPA and class rank conditions and introduced the use of graded writing samples to allow all students the opportunity to apply as

[4] Diversity rankings include historically Black colleges, with the lowest index of .002 for Tougaloo College. See https://www.usnews.com/best-colleges/rankings/national-liberal-arts-colleges/campus-ethnic-diversity

test-optional (Maguire, 2018). The study revealed that test-submitters performed 7% better than test-optional students during their first year; however, test-optional students were nearly twice as likely to be eligible for Pell Grants. When F&M coupled a test-optional policy with increased financial aid resources, their Pell-eligible student enrollment percentages increased from 7.8% in 2006 to 17.7% in 2016 (Maguire, 2018). The researcher recognized that test-optional implementation was an appropriate course of action to achieve their goals; though, it was not in isolation as other enrollment and financial aid structures supported the process (Maguire, 2018).

Also contributing to the test-optional literature, NACAC (2008) published a report titled *A Report of the Commission on the Use of Standardized Tests in Undergraduate Admissions*. In the report, an appointed commission consisting of higher education presidents, deans, admission directors, high school counselors, and NACAC members addressed several topics regarding the use and misuse of ACT/SAT scores and predictability. The report provided recommendations regarding the functionality of the ACT/SAT and the future direction of admissions. The first section of the report identified the need to question and reassess the foundations of college admissions exams. The Commission acknowledged that most four-year institutions use standardized test scores as a primary admissions factor. However, the experts provided research-based recommendations that ACT/SAT test-requiring policies are not "one-size-fits-all" and may not be suitable for all colleges (NACAC, 2008). They advised the use of other achievement tests more closely related to specific class curricula, such as AP exams, IB exams, and SAT II Subject Tests. The report noted research from the University of California that curriculum content, high school grades and achievement tests are valid indicators of college performance (Geiser & Santelices, 2007; Geiser with Studley, 2002). The Commission also referenced a research-based

report by Achieve, Inc., a nonprofit education reform organization, which stated that the SAT and ACT do not reflect a full range of high school achievement (Achieve, Inc., 2007).

Next, the Commission referenced the misuse of standardized test scores, articulating that the PSAT, SAT, and ACT were never intended for institutional ranking criteria, bond rating indicators, or to determine merit aid eligibility (NACAC, 2008). Presently, the U.S. News Best Colleges report and other college ranking publications factor ACT and SAT scores into their ranking model indicators. The Commission called attention to the bond rating firms, ranking publications, and the National Merit Scholarship Corporation to cease the use of test scores in their reports, as it creates undue pressure on admissions representatives to seek higher test scores and leads to inequitable merit aid awards. They also recommended periodic usage audits to help limit the misuse of ACT/SAT scores (NACAC, 2008).

In addition to the misapplications reported by the Commission as shared above, the use of ACT/SAT for secondary education reporting is another concern for testing misuse. In accordance with the federal Every Student Succeeds Act (ESSA), all states have the option to allow districts to use nationally recognized exams (such as the ACT/SAT) in lieu of their state high school accountability tests (U.S. Department of Education, 2017). As of 2020, 24 states will use either the ACT or SAT to meet ESSA's high school testing requirements (Olson, 2019). Testing proponents suggest the benefits of ACT/SAT use such as brand-name recognition and shorter testing length than most state-designed exams. Also, if the state utilizes the ACT/SAT for their annual high school testing requirement, then the tests are free for students (Olson, 2019). In contrast, test-optional advocates point to claims by ACT and SAT that their assessments are designed to demonstrate college and career readiness, and they also reference misalignments between the ACT/SAT and state high school standards (Achieve, Inc., 2018).

Further, in New Jersey ACT/SAT scores are used for local and state benchmarking as noted in the annual NJ School Performance Reports section titled PSAT, SAT, & ACT Participation and PSAT, SAT, & ACT Performance (State of New Jersey Department of Education, 2018). The purpose of the K–12 reports, as shared on the website, is to benchmark school performance against other NJ schools and statewide outcomes, identify areas of improvement, and build upon school strengths. The use of ACT/SAT for benchmarking and reporting of secondary school progress is not the intent of the tests. As noted on the College Board's website, "[The SAT] was created to expand access to higher education" and to help students transition to college. This extended use of ACT/SAT scores is in contrast with the intent of test-optional colleges, as they are striving to de-emphasize testing by providing admissions options for students rather than promoting test participation. Moreover, the use of ACT/SAT for benchmarking may cause undue pressure on high school teachers, counselors, and school administrators to increase student participation and "teach to the test" for higher scores.

In the final portion of the NACAC report, the Commission recommended a fundamental training program to inform college admissions professionals and high school counselors about the appropriate use of standardized test scores. They proposed the following program components: institutional objectives for use of scores, ethical standards, admissions test properties, test preparation methods, score disparities, statistical and interpretive concepts, predictive validity, and admissions models (NACAC, 2008). The report concluded with advisement to constituents that standardized tests should not serve in isolation to predict college success and prompted institutions to incorporate alternative tests such as AP, IB, SAT II Subject Tests, or state-level high school exit exams for admissions (NACAC, 2008).

Steven Syverson, author of *The Role of Standardized Tests in College Admissions: Test-Optional Admissions*, and Jonathan Epstein, author of *Behind the SAT-Optional Movement: Context and Controversy*, both offered unique perspectives on the test-optional topic as well as references parallel to the NACAC report and Belasco et al. (2014). Syverson, former vice president of enrollment for Lawrence University and former vice president of NACAC, provided expert commentary on the issue of high school students, counselors, and parents interpreting a college's "average SAT score" as a minimum score rather than a modal tendency of the scores, potentially discouraging students with a lower than average score from applying. Syverson (2007) noted that colleges have recognized this misuse and misunderstanding of test score information and are providing a range of the middle 50% of test scores, which portrays a comprehensive test score profile of the college.

Syverson (2007) critiqued standardized test scores by stating that they do not measure student creativity and should not be used if inconsistent with the institutional mission. He provided examples of test-optional colleges' admissions policies from institutions such as Lewis & Clark College and Guilford College, which offered substantive writing projects and portfolios in lieu of test scores (Syverson, 2007). His conclusion regarding latent outcomes was similar to that of Belasco et al. (2014) in noting that the adoption of test-optional policies would produce a greater number of applicants with lower test scores omitted, leading to enhanced prestige and selectivity (Syverson, 2007). He purported that some institutions use test-optional admissions as means to generate a more diversified applicant pool, while others utilize test-optional policies as a marketing decision in hopes of garnering publicity (Syverson, 2007).

Hiss and Franks (2014) also published a study that analyzed data from 123,000 students and alumni from 33 test-optional colleges and universities (20 private, six public, five minority

serving, and two art institutes). The researchers used multiple regressions of aggregate data, Cohen's d and Chi-square analyses. According to this study, students without test scores enrolled at private and public institutions were more likely to be minorities, women, Pell Grant recipients, first-generation students, and those with learning differences (Hiss & Franks, 2014). Their outcome validated the theoretical framework that test-optional admissions fulfilled a manifest function by supporting URM and low SES enrollment. Hiss and Franks also confirmed that HSGPA predicted college GPA strongly for both test submitters and non-submitters. Further, students with strong HSGPAs but without test scores are likely to succeed in college; students with low HSGPAs and a broad range of test scores are likely to have lower college GPAs and graduation rates (Hiss & Franks, 2014). This sample was able to magnify the necessity to provide test-optional policies, as non-submitters were predominantly students in need of financial and learning assistance, first-generation, and URM. Rooney and Schaeffer (1998) shared similar findings in their case study of five test-optional colleges. They found that relatively few admissions descisions changed with submitted ACT/SAT scores and that high school performance (grades and class rank) was the best applicant screening tool (Rooney & Schaeffer, 1998).

Along with the test-optional momentum, Syverson et al. (2018) published a study as a continuation of the Hiss and Franks (2014) test-optional study. The researchers analyzed "pre-policy" and "post-policy" data submitted voluntarily by 28 institutions of varying selectivity, size, type, location, and rank. The study specified that the term "test-optional" varies between institutions. The findings demonstrated that roughly two-thirds of their test-optional institutions experienced URM student population growth above that of peer test-requiring institutions (Syverson et al., 2018). The researchers also found that all institutions experienced application

growth. These findings theoretically fulfilled both manifest and latent functions. The research also provided two case studies on private, not-for-profit institutions; one represented a large urban school labeled “Institution A” and the other represented a small suburban school labeled “Institution “B.”. The authors reported that Institution A enrolled 15% more URM students after adopting a test-optional policy and a 12% rise in the proportion of students with financial need (Syverson et al., 2018). Institution B saw a similar URM student increase, 17% higher after adopting a test-optional policy; yet, the proportion of students with financial need was 11% lower (Syverson et al., 2018).

The researchers stated, “The experiences of institutions in this study provide evidence that the adoption of a well-executed test-optional admission policy can lead to an increase in overall applications as well as an increase in the representation of URM students (both numeric and proportionate) in the applicant pool and the freshman class” (Syverson et al., 2018, p. 3). This research provided context for the test-optional movement; however, the limitation was the selection of institutions (size and the type) for the case studies. The researchers collected data from a small number of institutions and provided two case studies, both from private institutions. Future analysis with additional case studies to include public institutions would further benefit the test-optional discussion.

In summary, the literature in defense of the test-optional movement has demonstrated significant success with regard to increasing URM and Pell-eligible enrollment, as well as increasing the applicant pool. The literature suggested that both manifest and latent function theories were evident, as referenced in Belasco et al. (2014) and Syverson et al. (2018). The depth and duration of test-optional policy effects have yet to be determined. Questions and gaps in the test-optional admissions policy literature, specifically regarding outcomes over time, still

remain. Therefore, follow-up studies with time series data are needed to either strengthen or challenge past results.

Potential Disadvantages of Test-Optional Policies

ACT/SAT proponents have raised two main issues regarding test-optional policies: the lack of high school grading standardization and the inability to expand diversity. Testing proponents assert that high school course offerings, rigor, and grading differ widely across secondary schools, whereas standardized tests provide uniformity, fairness, and neutrality to assess prospective students for admissions. Proponents have examined issues with the de-emphasis or elimination of ACT/SAT scores and found the lack of grading standardization problematic, specifically when the weight of credentials is placed on high school grades (Shaw, 2018). While there is research reporting that high school grades are better indicators of college grades than standardized tests (NACAC, 2008), it is important to recognize high school grading inconsistencies and "grade inflation." With over 42,000 schools (public and private) providing secondary education in the U.S. (NCES, 2019), one can assuredly predict variations in grading standards, point systems, and rigor of each class in each high school. Also, the ACT conveys the importance of test scores to control for grade inflation and strength of curriculum (Mattern & Allen, 2016). The ACT posits, the removal of test scores and use of HSGPA as the primary criteria for admissions may compel students to take fewer challenging courses with higher grading standards (Mattern & Allen, 2016).

In a study spanning from 2005 to 2016, Seth Gershenson (2018) reported significant findings from North Carolina statewide high school data regarding grade inflation and discrepancies between Algebra I final course grades and the standardized state-required Algebra I end-of-course (EOC) exam. The research found that many students earned top Algebra I final course grades, yet only a few earned top scores on the Algebra I EOC exam (Gershenson, 2018).

Further, only 5% of students who received course grades of "A" (90–100 points) and "B" (80–89 points) achieved the highest score of "superior" on the EOC exam (Gershenson, 2018). The study also reported that 36% of "B" students did not reach EOC proficiency scores and 57% of "B" students did not meet college and career readiness scores on the EOC exam. These findings demonstrated grade inflation, as students who earned considerably "good grades" in the class failed to meet mastery of key skills and knowledge on the state exam (Gershenson, 2018).

Robert Laird, former director of undergraduate admissions for the University of California-Berkeley, continued the dialogue regarding rigor and grading inconsistencies, stating that curriculum rigor does not have common meaning for students within or across high schools (Laird, 2005). Without standardization, the variations of grading scales and methods of HSGPA calculations for each individual class across U.S. high schools make student comparisons very difficult. The high school grading variations include but are not limited to the use of varying HSGPA scales, such as 0–4.00 or 60–100; a weighted HSGPA (to reflect rigor); an unweighted HSGPA; and the subjectivity of teacher-assigned grades calculated within HSGPAs. Also concerning to standardization proponents is the difficulty in verifying the authenticity of test-optional application materials such as essays, awards, and extra-curricular activities (Laird, 2005). The evaluation of unstandardized application materials can be time-consuming for the admissions offices, difficult to assess and compare across applicants, susceptible to measurement error, and subjective to the application reader. Therefore, the use of standardized testing is the best approach to alleviate subjectivity and ambiguity in the admissions process (Shaw, 2018).

In addition to the HSGPA inconsistencies discussion, testing proponents also argue that a test-optional policy does not improve campus diversity; rather it favors improving the perception of institutional selectivity. ACT/SAT proponents have reflected on the test-optional institutions

in the Belasco et al. (2014) study, where ethnic, racial, and economic diversity did not improve. Further, the institutions received an increase of approximately 220 applications and an increase of 26 points on reported SAT scores, thus improving the appearance of institutional selectivity (Lucido, 2018). Researchers Hiss and Franks claimed, "while optional testing seems to work as an affirmative action device, the policy also has wide appeal across all ethnic categories, including white students" (Hiss & Franks, 2014, p. 30).

However, their study did not confirm whether test-optional policy implementation increased URM enrollment (Zwick, 2018). Also contributing to the dialogue, Sweitzer et al. (2018) empirically examined the impact of test-optional policies on diversity and admissions using data from over 100 institutions between 1999 and 2014. Their findings revealed that the racial diversity percentage of liberal arts colleges did not change after adoption of test-optional admissions. They found the degree of increased diversity was the same for both test-requiring and test-optional institutions (Sweitzer et al., 2018). The researchers inferred that the test-optional movement will continue to expand and institutions should take heed of the possible unintended consequences (Sweitzer et al., 2018).

Laird (2005) and Gershenson (2018) reported compelling findings regarding the lack of HSGPA standardization and cautioned about the use of unstandardized, test-optional materials. Belasco et al. (2014) and Sweitzer et al. (2018) reported test-optional findings on different measures—diversity and admissions—and cautioned test-optional adopters. While the researchers presented different disadvantages of test-optional policies, they similarly cautioned the test-optional movement. In the section below, several field experts and researchers suggest alternatives to test-optional and test-requiring admissions policies.

Augmenting the ACT and SAT for Admissions

Epstein (2009) added to the test-optional dialogue by providing a possible solution to SAT usage for admissions. He suggested a "dual interpretation method" in which admissions staff access local SAT average data to evaluate an applicant's test score within the context of the applicant's direct peers for a more rational and equitable admissions process (Epstein, 2009). Such information can now be accessed via the College Board's Landscape. The Landscape tool provides admissions representatives with three categories of high school and neighboorhood information: "Basic High School Data"—locale, class size, free/reduced lunch percentage, average SAT scores at colleges attended, and AP participation and performance; "Test Score Comparision"—applicant scores compared to others from the same high school; and "High School and Neighborhood Indicators"—college attendance, household structure, median family income, housing stability, education levels, and crime data (College Board, 2020a).

The need for such augmentation in admissions is due to the variations in secondary schools, academic profiles, and competition of ranked students. For example, a valedictorian from a moderately competitive school may have a lower HSGPA or ACT/SAT score compared to a valedictorian from a highly competitive school where ranking is decided by the ten-thousandth decimal point, yet they may share the same top rank. As mentioned above, with over 42,000 schools providing secondary education in America, the academic profiles of ranked students vary for each school, county, and state. Laird (2005), also in support of augmenting the admissions process, recommended that appropriate admissions criteria should not be absolute. As rigor and grading lack standardization, Laird (2005) suggested that the evaluation of criteria such as courses taken, especially advanced-level, should reference the applicant's high school

course availability, tracking policies, course limitations, and other disclosed conditions affecting course registration, completion, and grades.

The NACAC Commission, Syverson (2007), Epstein (2009), and Laird (2005) shared a similar view for admissions, where the most appropriate and equitable evaluation should include a holistic, multifaceted application consisting of high school performance, standardized test scores, writing samples, recommendation letters, interviews, and other metrics such as auditions and artistic portfolios for specialized programs. From the perspective of Meredith Twombly, former dean of enrollment for Hampshire College (test-blind admissions), and her evaluation of the institution's data, the addition of an application essay in lieu of test scores led to a decline in the number of applicants. Twombly found this favorable, as she reported that incomplete applications demonstrated less engaged students and she prefers yield over other admissions metrics (Twombly, 2017).

From a theoretical viewpoint of augmenting assessments, both Howard Gardner's theory of multiple intelligences (1983) and Robert Sternberg's triarchic theory of intelligence, also known as the theory of successful intelligence (1999), have provided theory-based testing alternatives and supplements. While Gardner acknowleged the utility of intelligence testing, he argued that standarized tests are skewed toward the measurement of linguistic and logical-mathematical intelligences (Gardner et al., 2018). During his research on cognitive development, Gardner deemed the use of a single instrument to measure intelligence as inadequate (Gardner et al., 2018). He developed defining criteria to delineate biological and psychological capacities and pluralized "intelligence" in his multiple intelligences (MI) theory (Gardner et al., 2018). These were original contributions to psychology, however tepidly received by the field (Gardner et al., 2018).

Gardner stated, “An intelligence is the biopsychological capacity to process information in order to solve problems or create products that are valued in at least one cultural setting” (Gardner, 1999, p. 33). Gardner (1983) defined the following intelligences of the MI theory: linguistic (verbal and written language), logical-mathematical (computation and scientific), spatial (geographical and dimensional space), musical (composition and performance), bodily-kinesthetic (movement control or expression), interpersonal (understanding of others), and intrapersonal (understanding of oneself). In later research, Gardner (2018) included “naturalist intelligence” (environmental discernment) to the MI theory list, and has considered but not yet included “existential intelligence” (conceptualization of human existence) and “pedagogical intelligence” (facilitation and dissemination of knowledge).

While psychology and psychometric fields critiqued the MI theory, it was globally accepted within educational and practical settings. Gardner suggested two processes, “individualization” and “pluralization,” to assist educators with conveying content and actualizing educational values (Gardner et al., 2018). Individualization prompts instructors to customize pedagogy and pluralization prompts the presentation of content to engage multiple intelligences (Gardner et al., 2018). Gardner’s processes and the delineation of multiple intelligences seemingly support augmenting standardized tests.

Robert Sternberg’s successful intelligence theory is defined as the ability to achieve success within personal standards and sociocultural context; the ability to capitalize on personal strengths and compensate for weaknesses; the ability to balance skills for environmental adaptation, shaping, and selection; and the ability to balance three aspects of intelligence: analytical, practical, and creative skills (Sternberg, 2004). According to Sternberg (2004), standardized tests demonstrate an intelligence that is relevant to the classroom; however, the tests

lack construct validity and lack the ability to measure tacit and creative intelligence (Sternberg, 2004). Whereas the widespread use of standardized tests spanning many levels of education is based on the purported predicitive validity of academic achievement (Mandelman et al., 2016). Sternberg (2010) posits that while cognitive and academic measurements are important for institutions, such measurements do not account for sociocultural context, personal success, and the three aspects of intelligence: analytical, practical, and creative skills (Sternberg, 2010).

Sternberg analyzed the three aspects of intelligence in his study the Rainbow Project, where supplementary testing was used to augment the SAT in predicting undergraduate performance for admissions (Sternberg, 2004). The SAT was augmented with the Sternberg Triarchic Abilities Test (STAT). The STAT subtests assessed analytical, practical, and creative abilities, with each test comprised of verbal, quantitative, and figural content (Sternberg, 2004). The study included 770 participants from eight four-year colleges, five community colleges, and two high schools with most of the data collected between April and June 2001. The findings demonstrated that the STAT subtests nearly doubled the predictive power of college GPA when compared independently to the SAT (Sternberg, 2004). The findings also indicated that STAT subtests reduced race and ethnic differences for Latino, Black, and Native American students (although this sample was small) relative to the abilities measured by the SAT (Sternberg, 2004). The limitation of the Rainbow Project is the collection of data at one time point; it could be strengthened with comparative data from a longitudinal study.

In alignment with augmenting the ACT/SAT, Sternberg (2018) recommended a shift away from the use of dated assessments that have not changed conceptually, and advised experimenting with a broad range of intelligence measures. The STAT assessments based on Sternberg's theory presented alternatives to standarized testing that identified analytical,

practical, and creative skills (Mandelman et al., 2016). Sternberg's Rainbow Project has provided theoretical grounding for augmenting admissions materials. It may also serve as a theoretical basis for institutions transitioning from a performance-based model to a student capacity model or eligibilty based model.

The complexity of college admissions is evident in the variations of processes and policy models (Hossler & Kalsbeek, 2009). Rigol's (2002) four frameworks provided philosophical perspectives on the college admissions process: eligibility-based models used to provide open access to college, performance-based models in which meritocracy and character guide admissions, student capacity to benefit models used to enhance talent and promote mobility, and student capacity to contribute models used to promote societal development while meeting organizational needs (Rigol, 2002). Standardized tests and test alternatives used as admissions guidelines are performance-based frameworks. Rigol suggested the interchangeable use of the four policy models to meet college admissions goals.

Many have published research and shared institutional perspectives on the advantages and disadvantages of test-optional policies and the concept of augmenting the ACT/SAT. The current literature acknowledges the growth of the test-optional movement and presents both support for and opposition to test-optional policies for undergraduate admissions decisions. Researchers have also identified overt and less overt institutional objectives for implementing test-optional policies. Similar to the critique on test-optional advantages, the notion of augmenting the ACT/SAT is relatively young compared to the inception of standardized testing, and thus would benefit from continued dialogue. Further research of all sides—advantages, disadvantages, and ACT/SAT augmentation—would strengthen or challenge current data and fill the literature gaps.

Standardized Test Industry: Financial Implications and Rebuttals

Empirical studies and reports continue to demonstrate positive correlations between SES and standardized test achievement (Bowen et al., 2018; College Board, 2016; Geiser with Studley, 2002; Zwick & Greif Green, 2007), and also between SES and post-secondary enrollment and persistence (NCES, 2018c). The College Board (2013) data for the mean SAT scores by reported income bands demonstrated near linearity of SAT scores and income. The College Board (2013) documented that within the reported family income band of $40,000 to $60,000 the mean SAT score was 987 (combined Critical Reading and Math), whereas the income band of more than $200,000 the mean SAT score was 1151. The median U.S. household income for 2013 was $52,250 (Noss, 2014). In nearly similar results three years later, the College Board (2016) documented that within the reported family income band of $40,000 to $60,000 the mean SAT score was 983, whereas the income band of more than $200,000 the mean SAT score was 1155. The median U.S. household income for 2016 was $57,617 (Guzman, 2017). The College Board did not publish the reported family income bands and corresponding test scores for subsequent years. The difference in SAT points between the income bands (164 and 172 for 2013 and 2016 respectively) demonstrates a strong positive correlation between SES and standardized test achievement.

The College Board (2017) *Suite of Assessments Annual Report* noted a difference between SAT fee waiver and non-fee waiver test-takers. SAT and ACT fee waivers are available for current eleventh or twelfth grade students testing in the U.S. or U.S. territories who are enrolled in or eligible for one of the following United States Department of Agriculture (USDA) Income Eligibility Guidelines: National School Lunch Program; total family income at or below USDA income levels; receive public assistance, federal, state, or local aid programming; reside in federally subsidized housing or foster home; or identify as a ward of the state, orphaned, or

homeless (ACT, 2019a; College Board, 2019a). The assessment report noted that test-takers without SAT fee waivers scored 109 total points higher than test-takers with fee waivers (College Board, 2017). In both SAT sections, Math and Evidence-Based Reading & Writing (ERW) test-takers without fee waivers had a mean score more than 50 points higher than test-takers with fee waivers, indicating a correlation between SES and test achievement for both sections (College Board, 2017).

The ACT's *Condition of College & Career Readiness 2017* report indicated that less than 25% of underserved learners (criteria identified by ACT as low-income, minority, or first-generation test-takers) met or surpassed three or four ACT College Readiness Benchmarks, compared to 50% not considered underserved who met or surpassed three or four ACT College Readiness Benchmarks. The data also reported disparities in STEM, where only 2% of underserved learners who identified with all three underserved criteria met the STEM benchmark, compared to 31% of those identified as not underserved (ACT, 2017).

The NACAC Commission also discussed economic disparities in the availability of and access to test preparation activities such as high schools with sufficient college counseling; opportunities to repeat tests for higher scores (or "superscore" best sections); and private test preparation resources (NACAC, 2008). While there is little research assessing the effects of test preparation and coaching, the NACAC Commission recognized the prevalence of the ACT/SAT billion-dollar test preparation industry and the advantage of preparation activities. Several for-profit test preparation companies have packages ranging from $150 to $1600 and tutoring ranging from $30 to $150 per hour. The Commission reported that test preparation participants had, although modest, a 20–30 overall point increase (NACAC, 2008). The Commission also noted that family income will continue to determine access to expensive test preparation

activities (NACAC, 2008). Further, Domingue and Briggs (2009) examined data from the Educational Longitudinal Survey of 2002 and found SAT-Math and SAT-Verbal scores increased approximately 11–15 points and 6–9 points respectively for students who took the PSAT and participated in SAT coaching activities (commercial courses and private tutoring).

The standardized testing industry is just as lucrative as the test preparation industry. As noted in the book *SAT Wars: The Case for Test Optional Admissions,* the testing industry grosses more than $4 billion annually with great potential to promote college entrance exams (Soares, 2012). The U.S. high school graduating class of 2019 had approximately 1.8 million ACT test-takers (ACT, 2019b) and over 2.2 million SAT test-takers (College Board, 2019b). If each student took the SAT once (without factoring in the optional essay fee, registration-linked fees, additional scoring fees, or fee waivers), the current $52 test fee would yield approximately $114 million. The optional essay, which presently costs $15 per test-taker, yielded approximately 1.4 million students, 64% of the 2019 class (College Board, 2019b). Thus, in 2019 the College Board earned more than $21 million from an essay test, which less than 30 degree-granting colleges in the U.S. require for admissions. Additional investigation of the funding sources that oppose or support standardized testing would provide an interesting context for future test-optional research. If the College Board were to reinstate the reporting of family income bands in the future, review of this information would provide a comprehensive, longitudinal dataset and fill such gap in the test-optional literature.

Rebutting the issue of financial disparities regarding test preparation, the College Board has collaborated with Khan Academy. The Khan Academy website is known for providing thousands of free, online tutorial videos on hundreds of topics in many languages. Khan's motto is "For free. For Everyone. Forever." They have broken barriers to expensive test preparation by

providing free full-length SAT tests for any user to complete, along with results and scoring explanations. The official College Board and ACT websites also offer free practice questions, testing strategies, college planning assistance, and additional benefits associated with fee waivers. There are for-profit test preparation companies that provide free online practice exams and access to free test preparation events. Test preparation materials are also available for loan in high school and public libraries throughout the U.S. for students with limited resources.

Gaps in the Literature

There is a vast amount of research available which focuses on the validity and reliability of ACT/SAT scores for undergraduate admissions with regard to predicting first-year success, retention, and completion (Sackett & Kuncel, 2018). For example, in 2019 the College Board published a national validity study of their product, the SAT, comprised of approximately 223,000 students and 171 four-year institutions; the study reported that SAT scores are predictive of college performance and student retention (Westrick, et al., 2019). This type of information has been used by college admissions representatives as a "sorting device," a predictor of college level achievement, and as a benchmark for a disparate applicant pool (Lucido, 2018).

Several case studies and large-scale studies have contributed to the test-optional policy literature after the Belasco et al. (2014) research, including Maguire (2018), Rubin & Canché (2019), Sweitzer et al. (2018), and Syverson et al. (2018). However, the availability of test-optional panel data currently pales in comparison to the historic and large-scale data on ACT/SAT's validity and reliability. ACT/SAT data is important to many colleges for institutional reporting, rankings, and admissions purposes. However, after decades of institutions implementing test-optional policies, it is equally important to contribute data and dialogue to the test-optional movement. Contributions including panel data with varying sample populations will fill a gap in the test-optional admissions literature.

Chapter III: Methods and Research Design

Qualitative and quantitative inquiries about the test-optional admissions movement guided the design for this study. The methodology and research designs for the qualitative and quantitative analyses are discussed below. The research questions are as follows:

1) How do institutions rationalize their test-optional policies?
2) To what extent does test-optional policy implementation affect the number of admitted students and applications?
    a. How are institutional acceptance rates affected?
3) To what extent does test-optional policy implementation affect the enrollment of Pell Grant recipients and underrepresented minority students?

Method: Sample Selection of Institutions

The institutions selected for the qualitative and quantitative samples met the criteria for the 2020 U.S. News Best Colleges "National Universities" category. The U.S. News Best Colleges methodology adhered to the Carnegie Classification of Institutions of Higher Education's Basic Classification for the ranking categories (Morse & Brooks, 2020). The sample is comprised of top tier institutions, ranked in the top 75% of their category. National institutions were selected for this study, as the current test-optional literature has not yet presented panel data for this group. Compared to liberal arts colleges, national institutions generally provide more research opportunities and more technical or advanced degrees, and typically have larger campuses, whereas liberal arts institutions generally provide a broad range of core curriculum, with most degrees granted in liberal arts disciplines, and tend to have smaller campuses (Fang, 2018). The qualitative and quantitative samples include public and private degree-granting institutions. Also, the samples include institutions within a comprehensive range of 2020 U.S.

News Best Colleges rankings (see Appendix A). The qualitative and quantitative samples are not mutually exclusive.

For the qualitative sample the rankings range from 6 to 281, and for the quantitative sample the rankings range from 25 to 281. The 25th ranking marker was determined by the highest-ranking test-optional institution within the timespan of the study—Wake Forest University ranked 27th—and the closest ranked test-requiring institutions were Carnegie Mellon University and University of Michigan, Ann Arbor, both ranked 25th. The 281st ranking marker was selected because the 2020 U.S. News Best Colleges did not individually rank subsequent colleges; institutions above the top 75% were group ranked as 293–381 (U.S. News & World Report, 2019). Further, the majority of the institutions in the group rankings had acceptance rates greater than 85%. After the institutions were selected, they were arranged into three groups: qualitative test-optional sample; quantitative test-optional sample (treatment group); and quantitative test-requiring sample (control group).

The qualitative sample was comprised of 70 test-optional and test-flexible institutions, with policy implementation dates spanning from 1995 to 2021. This group included institutions with undergraduate enrollment ranging from 1,000 to 53,000 students. The qualitative sample also included test-optional institutions without ranking or panel timespan parameters (see Appendix B).

The quantitative treatment group was comprised of 28 test-optional and test-flexible institutions taken from the qualitative sample. This group included institutions with undergraduate enrollment ranging from 1,000 to 30,000 students. The treatment group had policy implementation dates occurring within the pre-policy and post-policy cut-off years of 2005–2006

and 2015–2016 respectively (see Appendix C). The specifications for the panel timespan are discussed in the research design section below.

The quantitative control group was comprised of 210 institutions with undergraduate enrollment ranging from 1,000 to 59,000 students. This group had test-requiring policies during the panel timespan from 2004 to 2018. Fourteen institutions from this group transitioned to test-optional after 2018. Although the transition did not influence the quantitative dataset, the transition to test-optional allowed for their evaluation in the qualitative analysis as well (see Appendix D).

The qualitative and quantitative treatment groups have test-optional policies that allow first-year, full-time applicants the choice to either submit or withhold ACT/SAT scores without penalty for undergraduate admissions. Also, the policies included are with or without academic, applicant, or program conditions. The institutions' admissions requirements were examined and confirmed that test-optional policies were in practice during the panel data timespan. The institutions have various test-optional strategic plans, such as the University of Delaware's four-year pilot program (in the final year) and long-standing policies as practiced by Chatham University and George Mason University (test-optional for nearly 15 years). The qualitative and quantitative treatment groups also included institutions where test-optional policies are not applicable for prospective National Collegiate Athletic Association (NCAA) athletes, as they are mandated by the NCAA to submit standardized test scores for athletic eligibility (National Collegiate Athletic Association, 2020).

It was necessary to exclude 42 institutions from qualitative sample for the quantitative treatment group to the meet the DD panel design, IPEDS data availability, and the pre-determined ranking marker. The DD timespan evaluated institutions that implemented test-

optional policies between academic years 2005–2006 through 2015–2016. Due to this timespan parameter and the limit of IPEDS data availability, 38 institutions were excluded. Three institutions from the sample identified as "always test-optional," and therefore could not be evaluated for the DD pre or post treatment, nor could they be categorized in the test-requiring control group. Lastly, one institution was excluded due to a ranking position above the marker. The aforementioned exclusions did not apply to the qualitative sample, as test-optional implementation dates, IPEDS data, and rankings did not impact the summative research.

Method: Data Collection

I collected the data from the following publicly available resources: IPEDS, U.S. News Best Colleges, FairTest, the selected institutions' websites, and public records such as institutional governing board documents. I stored and organized the qualitative and quantitative data on spreadsheets. Then, the quantitative dataset was merged into Stata, a statistical software application, where the variables and observations were transformed in preparation for the DD analysis (see Table 1).

Table 1

Descriptive Statistics

Variable	Obs	Mean	Std.Dev.	Min	Max
Admitted students	3696	7802.035	6088.201	0	36088
Applications	3696	13472.29	12274.65	0	97894
Acceptance rate	3694	.648	.165	.143	1
Pell Grant recipient enrollment	2728	3974.511	3613.581	129.157	26294.38
Total enrollment (all students)	3718	16765.83	12406.53	361	68475
First-time undergraduate enrollment	3705	2335.998	1827.531	29	8688
American Indian/Alaska Native total enrollment	3687	87.739	188.263	0	1995

Variable	Obs	Mean	Std.Dev.	Min	Max
American Indian/Alaska Native FT UG enrollment	3674	11.516	25.706	0	329
Black/African American total enrollment	3687	1341.573	1689.595	0	13051
Black/African American FT UG enrollment	3674	179.326	249.576	0	2663
Hispanic/Latino total enrollment	3665	1371.552	2441.198	0	37224
Hispanic/Latino FT UG enrollment	3630	218.168	323.558	0	3222
Native Hawaiian/Pacific Islander total enrollment	2268	29.222	65.416	0	1334
Native Hawaiian/Pacific Islander FT UG enrollment	2260	3.75	6.334	0	61
More than one race total enrollment	2268	495.164	525.197	0	4473
More than one race FT UG enrollment	2224	98.144	95.323	0	595
URM combined total enrollment	2268	3606.466	3947.446	54	45899
URM combined FT UG enrollment	2224	555.791	533.235	0	3788

Note. FT = first-time, UG = Undergraduate, URM combined = total of race/ethnicity variables.

The primary independent variable identified institutions that implemented a test-optional policy within the panel timespan. The dependent variables selected for this study were modeled from the previous research of Belasco et al. (2014), Sweitzer et al. (2018), and Syverson et al. (2018) for the purpose of analyzing test-optional policy effects on undergraduate admissions and enrollment. The data for the dependent variables were collected from IPEDS and included the following: number of admitted students; number of applications; Pell Grant recipient enrollment; total enrollment (all students) and first-time undergraduate enrollment (degree- or certificate-seeking students); total enrollment and first-time undergraduate enrollment of American Indian or Alaska Native, Black or African American, Hispanic or Latino, Native Hawaiian or Other Pacific Islander, and those reporting more than one race; and total enrollment and first-time undergraduate enrollment of URM variables combined. For the variable institutional acceptance

rate, I generated a unique dependent variable by which the number of admitted students was divided by the number of applications.

The variables for first-time undergraduate enrollment captured those affected by test-optional policies, whereas the variables for total enrollment captured those affected and unaffected by test-optional policies. Total enrollment captured all students including the retention of those that may have been affected by test-optional policies, as well as transfer students that often follow unique admissions requirements. While this study did not investigate retention or transfer populations, total enrollment is an important measure for test-optional advocates and challengers. For example, test-optional advocates may argue that the increase in total enrollment demonstrates the successful selection and retention of test-optional applicants.

The study controlled for the following time-variant variables from IPEDS that may have impacted admissions profiles: average institutional grant aid awarded to full-time, first-time undergraduates; average in-state tuition for full-time undergraduates; endowment assets per full-time equivalency (FTE) enrollment; and institution expenditures per FTE (academic support, institutional support, instruction, public service, research, student service, and other core expenses).

Research Design for Qualitative and Quantitative Analyses

The first research question required qualitative data for a summative analysis of admissions policies from the sample of test-optional institutions. The subsequent questions required quantitative data collected from one year prior to the institutions' test-optional implementation, and data after the second year of policy implementation for a pre-post examination. The justification for comparing data after the second year allowed for the test-optional policy to run at least two fall admission cycles and to admit at least two freshman classes, as the first year of implementation may not reach prospective applicants or affect

admission profiles within that same year. Further, during the first year of policy implementation, an institution is very likely addressing administrative and staffing adjustments, along with marketing the admissions changes to the public. Data analysis after the second year also allowed for potential implementation date discrepancies. According to Huberman and Miles (1984), a policy adoption timeline has distinct points: the initial awareness of innovation, development, and the moment of use. In their research on school innovation outcomes and implementation processes, they found that the transition from awareness to utilization typically spanned 14 to 17 months (Huberman & Miles, 1984).

For the first research question regarding test-optional policy rationalization, I performed a summative analysis. The research design was guided by Miles and Huberman's (1984) components of qualitative analysis, which included data collection and three concurrent actions: data condensation, data display, and conclusion drawing and verification. The qualitative method began with an examination of the sample institutions' test-optional policies, as provided on their websites and public records. The extent of publicized information varied within the sample webpages, ranging from minimal text shared on an admissions home page to detailed text found on a separate test-optional content page. Institutions either explicitly stated their rationale, many with content in "frequently asked questions" web sections, or they were less overt with brief test-optional explanations. I documented the webpages and recorded the recurring types of test-optional policies.

Next, I condensed the full policies by extracting "essential text"—key identifiers that summarized the policies—and coded the identifiers as rationale themes. The identification of essential text in qualitative analysis serves as a "point of entry into the meaning of the whole text" (Rapport, 2010, p. 273). The simplification of assembled information, data condensation, is

one of three qualitative data analysis components (Miles et al., 2014). The rationale themes were recorded in frequency tables and organized into three groups: 1) frequency of a singular rationale theme observed, 2) frequency of two or more rationale themes observed, and 3) frequency of each theme separately observed (taken apart from the preceding group). The organization of the rationale themes addressed Miles and Huberman's (1984) second component of analysis, data display. Lastly, I evaluated and discussed the themes in the data analysis section of this study, fulfilling Miles and Huberman's (1984) third component, conclusion drawing and verification.

For the subsequent quantitative research questions, cross-sectional panel data was used to investigate test-optional institutions (treatment group) and test-requiring institutions (control group). The quasi-experimental technique, difference-in-differences or "double difference" regression, is a suitable design for two time points, before and after, with a qualification variable where one group is treated at some point and the other is not treated during the panel timespan (Lee, 2016). The difference-in-differences (DD) technique was employed to analyze the groups at two time points: 1) one year prior to test-optional implementation and 2) after the second year of test-optional implementation.

The treatment group consisted of institutions that implemented test-optional or test-flexible policies, with or without conditions, and transitioned to test-optional admissions between academic years 2005–2006 through 2015–2016. Specifically for this study, DD analyzed variables pre-policy treatment (one year prior) occurring no earlier than 2004–2005, and post-policy treatment (two years after) occurring no later than 2017–2018. IPEDS 2018–2019 enrollment and diversity outcome data was not yet available for this research. The treatment cut-off date was 2015–2016 to meet the post-policy analysis date, 2017–2018. This cut-off date was a limitation, as 29 institutions implemented a test-optional policy after such time and thus were

excluded from the analysis. For this time series design, the pre-policy and post-policy variables were generated with lag operators, n + 1 and n − 2 respectively (Hamilton, 2009).

The DD technique examined the strongly balanced panel data and cross-sections at two time points with a time-constant qualification. A panel dataset is considered strongly balanced when each panel contains the same number of observations and the same time points (StataCorp, 2019). Within the design of DD, an appropriate counterfactual scenario estimates a casual effect, or counterfactual causality (Lee, 2016). Specific to the Stata software, the fixed-effects (within) regression estimator was employed. To infer causality, this study compared the treatment group to a similarly profiled control group. The formal expression of the DD regression model for this study aligns with models demonstrated by Belasco et al. (2014), Kelchen (2019), Lee (2016), and Torres-Reyna (2020). The equation is as follows:

$$Y_{it} = \beta_0 + \beta_1 (\text{Treat} * \text{Post})_{it} + \beta_2 Exp_{i(t-1)} + \beta_3 X_{it} + \lambda_i + \mu_i + \epsilon_{it}$$

where Y represents the outcome variables, i = institution and t = year, β_1 is the coefficient for the independent variable (test-optional treatment) over two time points, *Exp* and *X* are the controls for expenditures, λ_i is the entity for institutional fixed effects, μ_i is the entity for year fixed effects, and ϵ_{it} is the removal of the unobserved confounder effect (error term).

A counterfactual scenario and Wooldridge test checked for serial correlation in the fixed effects, panel data model (Drukker, 2003). The counterfactual causality for the DD analysis addressed the causal and response variables to estimate the causal effect (Lee, 2016). The Wooldridge test was employed to investigate the following in the fixed effects design: sample size and structure; evaluation of the null hypothesis of no serial correlation, the test's power against levels of autoregressive and moving-average correlation; and conditionally homoscedastic and heteroscedastic idiosyncratic errors (Drukker, 2003). When executed, the

Wooldridge test results demonstrated no first-order autocorrelation; therefore, there were no significant concerns and the null hypothesis was rejected with high confidence.

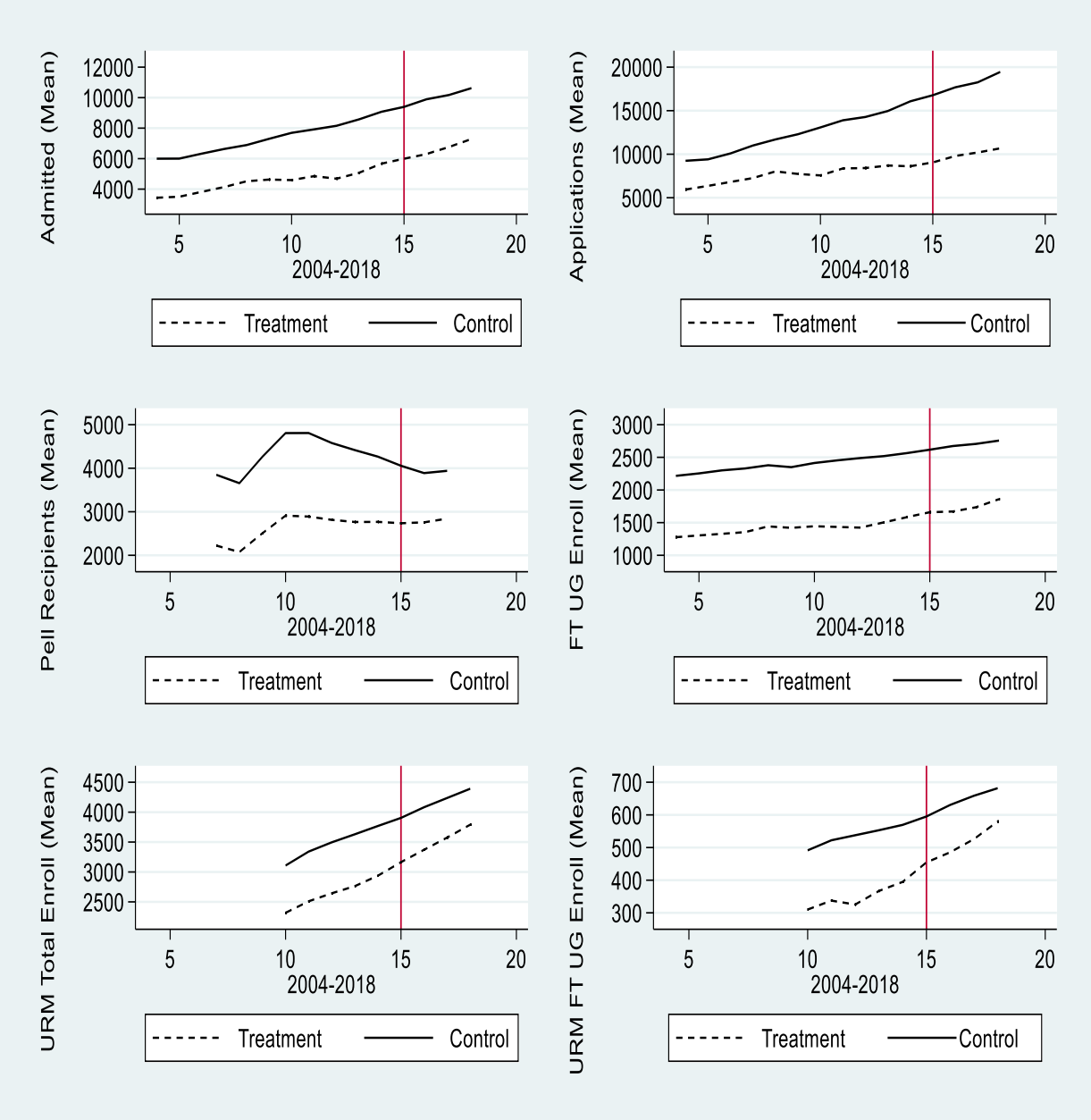
To secure the internal validity of the DD model, the parallel trends or common trends assumption must demonstrate that in absence of treatment, the difference between the two groups is constant over time (Angrist & Pischke, 2009). While the parallel trends assumption is not statistically tested, two-way graphs were used for visual evaluation, as illustrated in Figure 1. In addition to the graphs, this study factored additional measures that allowed the parallel trends assumption to hold, such as the examination of data at two time points, and the disaggregated sample of institutions with similar admissions, enrollment, ranking, and classification profiles. To reduce biased estimates and to allow the assumption of parallel trends to hold, I reserved the sample to similarly profiled institutions. Explicitly, the national colleges and universities selected for this study were ranked in the 2020 U.S. News Best Colleges report. Within the specificity of national institutions, the sample was inclusive of private and public classifications with undergraduate enrollment ranging from 1,000 to 59,000 students.

The parallel trends assumption for this study examined the trajectories of the test-optional, treatment group and the test-requiring, control group on the mean number of admitted students, applications, Pell Grant recipient enrollment, first-time undergraduate enrollment, URM combined total enrollment, and URM combined first-time undergraduate enrollment (see Figure 1 below). The graphs exhibit the subset of institutions that adopted test-optional policies in 2015. The solid line represents the control group and the dashed line represents the treatment group. The vertical (y) axis represents the outcome variable and the horizontal (x) axis represents the panel timespan, 2004 to 2018. The vertical line at the year 2015 represents the treatment group's test-optional implementation date. As illustrated, the parallel trends assumption graphs

demonstrate that the difference between groups is constant from 2004 to 2018 and infers that the treatment and control groups would have parallel trajectories without treatment.

Figure 1

Parallel Trends Assumption Graphs



Note. FT = first-time, UG = Undergraduate, URM combined = total of race/ethnicity variables.

Institutional fixed effects controlled for pre-existing and unobservable variables collected from IPEDS, and they controlled for year-specific factors that affect all colleges. To assess distribution normality of financial measures (grant aid awards, in-state tuition, endowment assets, and institution expenditures) and outcome variables (admitted students, applications, acceptance rate, undergraduate enrollment, and enrollment of Pell Grant recipients and URM students), skewness-kurtosis and Shapiro-Wilk tests were executed (Hamilton, 2009). To achieve normal distribution and to reduce the effects of outliers, the variables were logarithmically transformed (Berry, 1987). Further, a correlation matrix test checked the log-transformed variables for multicollinearity (see Appendix F). The correlation matrix revealed two pairs of strongly correlated variables: average in-state tuition with average grant aid (0.67) and instructional support with academic support (0.62). Current research varies on whether to remove or retain strongly correlated variables. For this study, I ran the regressions with and without the correlated pairs and found insignificant changes in the outputs. Since the changes were negligible, I retained all variables for the final regressions, discussed in the results section below.

Lastly, the financial measures were adjusted for inflation using the *Consumer Price Index for All Urban Consumers: Tuition, Other School Fees, and Childcare in U.S. City Average* (CPI) to reflect 2018 dollars (FRED® Federal Reserve Bank of St. Louis, 2020). To control for heteroscedasticity and serial correlation, both robust-variance and cluster standard error estimation commands were executed (Angrist & Pischke, 2009; Hamilton, 2009).

Study Limitations

Institutional policy changes such as test-optional admissions are susceptible to many observable and unobservable factors occurring in tandem such as economic conditions, societal climate, and other local, state, or federal changes. Individual studies may not have the capacity to control for all conditions, and are therefore subject to limitations. I have identified the limitations

of this study to include limitations in the sample, controls, and design. The sample size was limited, as several institutions were excluded due to the test-optional implementation dates occurring prior to or after IPEDS data availability. Also, the sample included institutions that adopted test-optional policies with and without conditions.

Policy conditions presented a limitation, as they are exclusive to select majors and/or academic thresholds, or require alternative application materials. Many policy conditions also restrict applicants who are homeschooled, international, ELL, or students with narrative high school transcripts or GEDs. The conditions limit the effectiveness of test-optional policies as the exclusions limit the test-optional population. Specific to this study, 71% of the institutions have test-optional policies that exclude homeschooled students and those with a narrative transcript or GED, 57% have academic thresholds, 96% require standardized testing for international or ELL students, 20% require alternative application materials, and only two institutions in this study are without conditions. Broadly, there are less than 20 ranked national institutions without test-optional policy conditions.

In previous research, the U.S. News Best Colleges rankings and position changes were found to affect admissions outcomes (Monks & Ehrenberg, 1999), and also to impact SES and racial demographics (Meredith, 2004). This study did not control for ranking position or categorical changes that institutions may have experienced during the panel timespan; therefore it is considered a limitation. The decision to omit this control variable was due to the numerous U.S. News Best Colleges methodology changes that occurred and the challenge to accurately normalize the rankings. Research on continual methodological changes and their impact on rankings and admissions would serve as a suitable framework to expand on the Meredith (2004) research.

The qualitative design included limitations in regard to data collection and review. The study presented data by means of textual evidence; however, it lacked interpersonal examination of admissions processes. The perspective from admissions offices collected by qualitative methods such as interviews, surveys, and observations would address a limitation and fill a gap in the test-optional policy literature. The summative analysis for this study would have benefited from a co-researcher or research team to provide additional review, categorization, and interpretation as well as the opportunity to elevate the analysis to hermeneutic phenomenology (Rapport, 2010).

Limitations for the quantitative analysis included missing or unknown institutional data and the exclusion of institutions that were identified as “always test-optional.” Although the always test-optional group would have been facinating to investigate, their exclusion was necessary as they were not applicable for a pre-post evaluation. Lastly, the unknown number of test-optional applicants compared to test-submitting applicants was also a limitation. Access to this data was not readily available through public resources. A future study regarding this comparision would make a fine addition to the literature.

Chapter IV: Qualitative and Quantitative Data Analysis and Results

This chapter was structured to first discuss the qualitative analysis and qualitative results in response to the research question: How do institutions rationalize their test-optional policies? Then the quantitative analysis and quantitative results respond to the research qestions: To what extent does test-optional policy implementation affect the number of admitted students and applications? How are institutional acceptance rates affected? To what extent does test-optional policy implementation affect the enrollment of Pell Grant recipients and underrepresented minority students?

Qualitative Data Analysis

The collection of qualitative data demonstrated variation in the availability of publicized information as well as variation in the frameworks for test-optional implementation. From the analysis, I extracted nine rationale themes and definitions that summarized the intitutions' test-optional policies. Based on the institutions' descriptions, I defined the rationale themes as such:

- Academic reflection: to allow applicants to submit admissions materials that best demonstrate or predict academic success, which may not be accurately projected on standardized tests.
- Assured, automatic, or guaranteed admissions: to abide by state laws or institutional policies that secure admissions for applicants who meet requirements other than test scores.
- Either/or: applicants must either meet thresholds such as minimum HSGPA or submit test scores.
- Flexibility: to allow students to choose the most suitable test(s) for admissions.
- Holistic review: to evaluate applications with concentration on factors such as personal essays, interviews, recommendation letters, academic rigor, and extracurricular activities.

- Improve access: to eliminate test score barriers as a means to advance equitable pursuit of higher education.
- Improve diversity: to eliminate test score barriers to advance applicant and enrollment diversity (diversity on a college campus includes but not is limited to race, ethnicity, nationality, age, genetic information, gender, gender expression or identity, sexual orientation, physical or cognitive ability, language, learning style, economic status, geographical representation, military or veteran status, political view, religious or spiritual belief, and other identities or ideologies) (Drake University, 2020; University of Rochester, 2020).
- Institutional use: to utilize test scores for purposes such as internal research, student course placement, or external reporting.
- Unspecified: policy simply provides an option for students to either voluntarily submit or withhold test scores, without further rationalization.

Immaculata University's undergraduate admissions webpage provides an example of an "unspecified" policy, where the following test-optional information is posted: "Official SAT or ACT test scores are optional, except for some programs [listed]. Please submit your test scores to be considered for our full-tuition presidential scholarship and for our Honors Program" (Immaculata University, 2020). In this case, Immaculata did not publicize additional test-optional rationalizations on the webpage; therefore, the rationale theme "unspecified" was recorded.

Qualitative Results

In a summative analysis of 70 national institutions, 31 provided limited information with only one rationale theme observed. Thirty-nine institutions provided detailed information with two or more rationale themes observed. Nine rationale themes were extracted, organized, and

displayed in frequency charts as three groups for analyses: 1) frequency of a singular rationale theme observed, 2) frequency of two or more rationale themes observed, and 3) frequency of each theme separately observed. The frequency charts are illustrated in Table 2, Table 3, and Table 4 respectively.

Table 2

Frequency of Singular Rationale Theme Observed

Rationale Theme Observed	Count
Academic reflection	11
Assured/automatic/guaranteed admissions	8
Either/or	8
Flexibility	2
Holistic review	0
Improve access	0
Improve diversity	0
Institutional use	0
Unspecified	4

Table 3

Frequency of Two or More Rationale Themes Observed

Rationale Two or More Themes Observed	Count
academic reflection, flexibility, holistic review	1
academic reflection, flexibility, holistic review, improve diversity	1
academic reflection, holistic review	11

Rationale Two or More Themes Observed	Count
academic reflection, holistic review, improve access	9
academic reflection, holistic review, improve access, improve diversity	4
academic reflection, holistic review, improve diversity	2
academic reflection, holistic review, institutional use	2
academic reflection, improve access	2
academic reflection, improve diversity	3
academic reflection, institutional use	1
assured/automatic/guaranteed admissions, holistic review	1

Table 4

Frequency of Rationale Themes Separately Observed

Rationale Theme Observed	Count
Academic reflection	47
Assured/automatic/guaranteed admissions	9
Either/or	8
Flexibility	4
Holistic review	31
Improve access	15
Improve diversity	10
Institutional use	3
Unspecified	4

The analysis revealed that "academic reflection" was the most frequent singular rationale theme to emerge, as 11 institutions provided "academic reflection" as their only framework for implementing a test-optional policy. For example, Brandeis University noted the following on their test-optional webpage: "This policy allows applicants to decide for themselves whether their test results accurately reflect their academic ability and potential and is consistent with recommendations from the National Association for College Admission Counseling" (Brandeis University, 2020). The rationale theme extracted from this text was "academic reflection" and was recorded in the frequency chart for singular rationale theme observed.

The most frequent two or more rationale themes to emerge were "academic reflection and holistic review," with 11 institutions reporting both rationalizations. George Mason University's test-optional policy is an example of this case, as they provided the following information on their freshman admissions webpage: "We take a holistic approach to reviewing each application with great care. We understand some students may not wish to submit standardized test scores as a component of the application process because they may believe the SAT or ACT test scores do not adequately reflect their level of academic achievement and/or predict their potential" (George Mason University, 2020). As such, the rationale themes extracted from this text were "holistic review" and "academic reflection." The observations were recorded in the frequency chart for two or more rationale themes observed.

I also recorded the frequency of the rationale themes separately, taken apart from the groups, to demonstrate the overall number of each theme. The theme observed most frequently overall was "academic reflection," with 47 observations, and the least frequent theme was "institutional use," with three observations. Examples of "institutional use" are found in the test-optional policies for the University of Saint Joseph (USJ), University of San Francisco (USF),

and St. John's University (SJU). The policies for USJ and USF require admitted applicants to submit ACT/SAT for advising or registration purposes and the policy for SJU strongly encourages all applicants to submit test scores for research and course placement.

As Table 5 illustrates, the rationale themes "improve access" and "improve diversity" had 15 and 10 observations overall, respectively. "Improve access" was nearly equal to the mean frequency of observations and "improve diversity" was slightly higher than the median. The themes "improve access" and "improve diversity" were not observed as singular themes; rather they were coupled with other test-optional frameworks. For example, "improve access" was observed along with "holistic review" and "academic reflection" in the following test-optional policy from Maryville University: "Students who feel their SAT or ACT scores are an accurate reflection of their academic abilities are welcome to submit them for admission consideration, scholarship consideration and/or course placement; however, students who do not submit test scores will not be viewed negatively. In support of our strategic plan as it relates to access and in alignment with our admissions philosophy of holistic review, each applicant will be reviewed based upon their academic record, extracurricular activities, recommendations, and essay for evidence of potential for success in college" (Maryville University, 2020).

Table 5

Analysis of Each Rationale Theme Separately Observed

Result	Total
Mean	14.55
Median	9
Range	44
Mode	4, appeared twice

Result	Total
Sum	131
Count	9

I was considerate of a priori assumption that the most frequent test-optional admissions rationalization could have been a framework aligned with improving access and improving diversity. The assumption was based on recognition of substantial literature and publicity across media forums on improving access and diversity by means of test-optional implementation. To protect the research from this preconception, I collected the data systematically in Excel, recorded all methodological decisions, and utilized three distinct categories.

Quantitative Analysis

The purpose of the statistical analyses for this research was to examine whether the number of admitted students, applications, acceptance rates, Pell Grant recipient enrollment, undergraduate enrollment and URM enrollment (first-time and total) differed as a result of implementing test-optional admissions policies. The sample population of national colleges and universities for the quantitative analysis included 28 test-optional (treatment) institutions and 210 test-requiring (control) institutions. The panel dataset included 3,780 observations and a total of 178 variables, with test-optional as the primary independent variable.

The DD quasi-experimental technique was employed to evaluate the impact of test-optional implementation on the dependent variables at two time points. Parallel trends assumption for the DD analysis demonstrated that the average outcome change for the treated group in the absence of treatment is equivalent to the average outcome change for the control group. The dependent variables were pre and post lagged ($n + 1$ and $n - 2$) for the DD design and log transformed for distribution normality. A correlation matrix test checked the log-transformed

variables for multicollinearity and skewness-kurtosis tests were executed. Robust-variance and cluster standard error estimation commands controlled for heteroscedasticity and serial correlation.

Quantitative Results

To begin the results discussion, Table 6 provides a summary of data where each variable row is the result of a separate regression. The summary illustrates statistically significant results for the enrollment of Pell Grant recipients, institutional acceptance rate, first-time undergraduate enrollment, Hispanic or Latino total enrollment, and Native Hawaiian or Other Pacific Islander first-time undergraduate enrollment. The summary provides the coefficient, standard error, t-value, p-value, 95% confidence interval, and significance level for each outcome variable. The test-optional policy treatment served as the independent variable with year fixed effects.

Table 6

Summary of Regression Results

Outcome variable	Coef.	St.Err.	t-value	p-value	[95% Conf.	Interval]	Sig.
Admitted students	0.057	0.051	1.13	0.261	–0.043	0.158	
Applications	-0.055	0.05	-1.11	0.27	-0.154	0.043	
Acceptance rate	0.07	0.021	3.39	0.001	0.029	0.111	***
Pell Grant recipient enrollment	0.146	0.04	3.65	0	0.067	0.226	***
Total enrollment	0.062	0.038	1.61	0.11	-0.014	0.137	
First-time undergraduate enrollment	0.11	0.049	2.25	0.026	0.013	0.207	**
American Indian/Alaska Native total enrollment	0.073	0.113	0.64	0.521	-0.151	0.297	
American Indian/Alaska Native FT UG enrollment	0.163	0.151	1.08	0.281	-0.134	0.461	
Black/African American total enrollment	0.157	0.11	1.43	0.154	-0.059	0.374	
Black/African American FT UG enrollment	0.209	0.151	1.38	0.168	-0.089	0.508	

Outcome variable	Coef.	St.Err.	t-value	p-value	[95% Conf.	Interval]	Sig.
Hispanic/Latino total enrollment	0.119	0.07	1.69	0.093	-0.02	0.258	*
Hispanic/Latino FT UG enrollment	0.135	0.087	1.55	0.124	-0.037	0.307	
Native Hawaiian/Pacific Islander total enrollment	0.128	0.163	0.79	0.432	-0.193	0.45	
Native Hawaiian/Pacific Islander FT UG enrollment	0.393	0.169	2.32	0.022	0.058	0.728	**
More than one race total enrollment	-0.072	0.127	-0.57	0.571	-0.322	0.178	
More than one race FT UG enrollment	0.078	0.104	0.76	0.451	-0.126	0.283	
URM combined total enrollment	0.012	0.039	0.29	0.769	-0.066	0.089	
URM combined FT UG enrollment	0.077	0.058	1.33	0.186	-0.037	0.192	

Note. FT = first-time; UG = undergraduate; URM combined = total of race/ethnicity variables. *** p<0.01, ** p<0.05, * p<0.1

For the number of admitted students outcome, the coefficient was 0.057, inferring that as a college goes test-optional, the number of admitted students increased 5.7% (see Table 7). The results for admitted students was insignificant and the regression failed to reject the null hypothesis with a t-value less than 1.96 and p-value greater than 0.1. The R-squared for the admitted total was 52%, indicating that approximately half of the variation can be explained by the model.

Table 7

Regression Results, Admitted Students

Admitted students	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Test-optional	0.057	0.051	1.13	0.261	-0.043	0.158	
Average grant award	0.072	0.034	2.09	0.038	0.004	0.139	**
Average UG in-state tuition	0.041	0.038	1.10	0.271	-0.033	0.115	

Admitted students	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Endowment assets	-0.007	0.011	-0.65	0.516	-0.029	0.015	
Academic support	-0.084	0.049	-1.71	0.089	-0.181	0.013	*
Instructional support	0.039	0.075	0.52	0.602	-0.109	0.188	
Institutional support	-0.010	0.038	-0.25	0.799	-0.086	0.066	
Public service	0.004	0.038	0.11	0.910	-0.070	0.078	
Research	0.010	0.022	0.47	0.640	-0.033	0.054	
Student service	-0.065	0.052	-1.24	0.218	-0.168	0.039	
All other core expenses	-0.011	0.007	-1.50	0.135	-0.026	0.003	
Constant	8.609	0.942	9.14	0.000	6.748	10.470	***

Mean dependent var	8.900	SD dependent var	0.701
R-squared	0.520	Number of obs	1567.000
F-test	22.726	Prob > F	0.000
Akaike crit. (AIC)	-1909.703	Bayesian crit. (BIC)	-1797.208

Note. UG = undergraduate

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Interestingly, the coefficient for the number of applications was -0.055, inferring a negative correlation. Meaning, as a college goes test-optional, the number of applications decreased 5% (see Table 8). The regression failed to reject the null hypothesis with a t-value less than 1.96 and p-value greater than 0.1. The R-squared for the applicant total indicated that the model explained 64% of the variance.

Table 8

Regression Results, Applications

Applications	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Test-optional	-0.055	0.050	-1.11	0.270	-0.154	0.043	
Average grant award	0.039	0.034	1.13	0.261	-0.029	0.107	
Average UG in-state tuition	0.031	0.032	0.96	0.339	-0.032	0.094	
Endowment assets	-0.001	0.014	-0.06	0.952	-0.028	0.026	
Academic support	-0.086	0.045	-1.94	0.055	-0.174	0.002	*
Instructional support	-0.007	0.081	-0.09	0.927	-0.167	0.152	
Institutional support	-0.038	0.037	-1.02	0.309	-0.112	0.036	
Public service	0.015	0.028	0.52	0.603	-0.041	0.070	
Research	0.002	0.028	0.07	0.947	-0.053	0.057	
Student service	-0.089	0.049	-1.82	0.070	-0.185	0.007	*
All other core expenses	-0.021	0.009	-2.40	0.017	-0.038	-0.004	**
Constant	10.298	0.869	11.86	0.000	8.583	12.013	***

Mean dependent var	9.353	SD dependent var	0.771
R-squared	0.643	Number of obs	1567.000
F-test	29.787	Prob > F	0.000
Akaike crit. (AIC)	-2055.602	Bayesian crit. (BIC)	-1943.106

Note. UG = undergraduate

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

For the institutional acceptance rate, the coefficient was 0.070, inferring a positive correlation. As a college adopts a test-optional policy, the acceptance rate increased by 7% (see Table 9). The regression rejected the null hypothesis with a t-value greater than 1.96 and p-value

less than 0.01, indicating statistically significant results. The R-squared for acceptance rate indicated that 12.2% of the variation can be explained by the model.

Table 9

Regression Results, Acceptance Rate

Acceptance rate	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Test-optional	0.070	0.021	3.39	0.001	0.029	0.111	***
Average grant award	0.019	0.013	1.46	0.146	-0.007	0.045	
Average UG in-state tuition	0.004	0.018	0.22	0.826	-0.032	0.040	
Endowment assets	-0.004	0.005	-0.78	0.434	-0.014	0.006	
Academic support	-0.004	0.019	-0.20	0.838	-0.041	0.033	
Instructional support	0.031	0.033	0.93	0.355	-0.034	0.095	
Institutional support	0.018	0.012	1.50	0.137	-0.006	0.043	
Public service	-0.004	0.011	-0.39	0.694	-0.026	0.017	
Research	0.007	0.012	0.56	0.576	-0.017	0.030	
Student service	0.020	0.020	1.02	0.310	-0.019	0.060	
All other core expenses	0.006	0.004	1.61	0.108	-0.001	0.013	
Constant	-0.120	0.357	-0.34	0.737	-0.824	0.584	

Mean dependent var	0.656	SD dependent var	0.156
R-squared	0.122	Number of obs	1567.000
F-test	5.191	Prob > F	0.000
Akaike crit. (AIC)	-4305.556	Bayesian crit. (BIC)	-4193.060

Note. UG = undergraduate

*** p < 0.01, ** p < 0.05, * p < 0.1

The coefficient for Pell Grant recipient enrollment was 0.146, inferring a strong positive correlation. As the number of colleges going test-optional increased, the number of Pell Grant enrollment increased nearly 15% (see Table 10). The regression rejected the null hypothesis with a t-value greater than 1.96 and p-value less than 0.00, indicating statistically significant results. The R-squared for Pell Grant recipient enrollment was 45.6%, indicating that nearly half of the variation can be explained by the model.

Table 10

Regression Results, Pell Grant Recipient Enrollment

Pell Grant enrollment	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Test-optional	0.146	0.040	3.65	0.000	0.067	0.226	***
Average grant award	0.047	0.033	1.40	0.163	-0.019	0.113	
Average UG in-state tuition	-0.015	0.025	-0.60	0.547	-0.063	0.034	
Endowment assets	-0.014	0.026	-0.53	0.596	-0.064	0.037	
Academic support	-0.041	0.046	-0.91	0.365	-0.131	0.049	
Instructional support	0.026	0.074	0.34	0.731	-0.121	0.172	
Institutional support	0.056	0.029	1.92	0.057	-0.002	0.114	*
Public service	0.020	0.027	0.75	0.455	-0.033	0.073	
Research	0.001	0.025	0.04	0.966	-0.049	0.051	
Student service	0.014	0.048	0.30	0.765	-0.081	0.110	
All other core expenses	-0.004	0.010	-0.38	0.702	-0.024	0.016	
Constant	7.423	0.862	8.61	0.000	5.720	9.126	***

Mean dependent var	8.359	SD dependent var	0.748
R-squared	0.456	Number of obs	1162.000

F-test	102.202	Prob > F	0.000
Akaike crit. (AIC)	-1527.059	Bayesian crit. (BIC)	-1436.017

Note. UG = undergraduate
*** p < 0.01, ** p < 0.05, * p < 0.1

Also inferring a positive correlation, the coefficient for the number of first-time undergraduate enrollment was 0.110. The regression results indicated that colleges going test-optional correlates with an increase of 11% for first-time undergraduate enrollment (see Table 11). The the null hypothesis was rejected with a t-value greater than 1.96 and p-value less than 0.05, indicating statistically significant results. The R-squared for first-time undergraduate enrollment had a variance of 24.6%.

Table 11

Regression Results, First-time Undergraduate Enrollment

First-time enrollment	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Test-optional	0.110	0.049	2.25	0.026	0.013	0.207	**
Average grant award	0.050	0.028	1.77	0.079	-0.006	0.107	*
Average UG in-state tuition	-0.028	0.031	-0.89	0.374	-0.089	0.034	
Endowment assets	-0.023	0.007	-3.03	0.003	-0.037	-0.008	***
Academic support	-0.052	0.035	-1.48	0.140	-0.120	0.017	
Instructional support	-0.010	0.058	-0.17	0.865	-0.124	0.104	
Institutional support	0.043	0.030	1.43	0.156	-0.017	0.103	
Public service	0.002	0.024	0.10	0.918	-0.045	0.050	
Research	-0.009	0.020	-0.44	0.663	-0.048	0.031	
Student service	-0.019	0.038	-0.49	0.627	-0.094	0.057	

First-time enrollment	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
All other core expenses	-0.012	0.007	-1.77	0.079	-0.025	0.001	*
Constant	8.239	0.613	13.44	0.000	7.029	9.449	***

Mean dependent var	7.832	SD dependent var	0.700
R-squared	0.246	Number of obs	1573.000
F-test	6.787	Prob > F	0.000
Akaike crit. (AIC)	-2989.906	Bayesian crit. (BIC)	-2877.331

Note. UG = undergraduate

*** p < 0.01, ** p < 0.05, * p < 0.1

For the number of Hispanic or Latino total enrollment, the results were marginally significant (see Table 12). While the t-value was 1.69, the regression rejected the null hypothesis with a p-value less than 0.1, indicating statistically significant results. The coefficient was 0.119, inferring a positive correlation as number of Hispanic or Latino total enrollment increased nearly 12%. The R-squared for total Hispanic or Latino enrollment indicated that 39.5% of the variation can be explained by the model.

Table 12

Regression Results, Hispanic or Latino Total Enrollment

Hispanic/Latino total enroll	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Test-optional	0.119	0.070	1.69	0.093	-0.020	0.258	*
Average grant award	0.044	0.100	0.44	0.662	-0.154	0.242	
Average UG in-state tuition	0.039	0.049	0.80	0.428	-0.058	0.136	
Endowment assets	0.001	0.022	0.06	0.956	-0.042	0.044	
Academic support	-0.219	0.076	-2.89	0.004	-0.369	-0.070	***

Hispanic/Latino total enroll	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Instructional support	0.139	0.224	0.62	0.535	-0.303	0.582	
Institutional support	-0.035	0.138	-0.26	0.798	-0.308	0.237	
Public service	0.001	0.035	0.02	0.985	-0.069	0.070	
Research	-0.265	0.101	-2.62	0.010	-0.465	-0.065	**
Student service	0.017	0.086	0.19	0.847	-0.154	0.187	
All other core expenses	-0.012	0.023	-0.52	0.603	-0.058	0.034	
Constant	8.596	1.586	5.42	0.000	5.463	11.728	***

Mean dependent var	6.733	SD dependent var	1.182
R-squared	0.395	Number of obs	1520.000
F-test	52.252	Prob > F	0.000
Akaike crit. (AIC)	1308.162	Bayesian crit. (BIC)	1420.017

Note. UG = undergraduate

*** p < 0.01, ** p < 0.05, * p < 0.1

Lastly, the regression results for Native Hawaiian or Other Pacific Islander, first-time undergraduate enrollment also demonstrated a positive correlation with a coefficient of 0.393. The results infer that as a college goes test-optional, the number of Native Hawaiian or Other Pacific Islander first-time enrollment increased nearly 39% (see Table 13). The regression rejected the null hypothesis with a t-value greater than 1.96 and a p-value less than 0.05, indicating statistically significant results. The R-squared for Native Hawaiian or Other Pacific Islander first-time undergraduate student enrollment regression had a variance of 2.6%. This is a small proportion of variation explained by the model, therefore it is a caveat for imprecise predictions. The amount of unexplainable variability coupled with the small sample size for this

population is a concern. However, there is no cause to discount the findings as the coefficient and p-value strongly identify the relationship.

Table 13

Regression Results, Native Hawaiian or Pacific Islander FT UG Enrollment

Hawaiian/Islander FT enroll	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Test-optional	0.393	0.169	2.32	0.022	0.058	0.728	**
Average grant award	0.125	0.259	0.48	0.630	-0.386	0.636	
Average UG in-state tuition	-0.136	0.093	-1.47	0.144	-0.320	0.047	
Endowment assets	0.092	0.131	0.70	0.483	-0.166	0.350	
Academic support	-0.459	0.181	-2.53	0.012	-0.817	-0.101	**
Instructional support	0.223	0.277	0.80	0.423	-0.325	0.771	
Institutional support	0.030	0.211	0.14	0.885	-0.386	0.447	
Public service	-0.047	0.126	-0.37	0.711	-0.297	0.203	
Research	-0.008	0.152	-0.05	0.960	-0.308	0.292	
Student service	0.316	0.276	1.14	0.255	-0.230	0.861	
All other core expenses	0.041	0.060	0.69	0.489	-0.076	0.159	
Constant	-0.404	5.080	-0.08	0.937	-10.440	9.632	

Mean dependent var	1.314	SD dependent var	0.975
R-squared	0.026	Number of obs	728.000
F-test	1.411	Prob > F	0.154
Akaike crit. (AIC)	1007.709	Bayesian crit. (BIC)	1076.564

Note. FT = first-time; UG = undergraduate

*** p < 0.01, ** p < 0.05, * p < 0.1

Given the statistically significant results and coefficients for Pell Grant recipient enrollment, first-time undergraduate enrollment, and two URM groups—Hispanic or Latino and Native Hawaiian or Other Pacific Islander—it is reasonable to conclude that test-optional policy implementation positively affects these dependent variables. Examination of the remaining URM groups—American Indian or Alaska Native, Black or African American, and those reporting more than one race—indicated that the results were not statistically significant. Given the negative coefficient for the number of applications and the insignificant results for number of admitted students, it is reasonable to conclude that test-optional policy implementation decreases the applicant pool and has little impact on admitted students. Given the statistically significant results for the institutional acceptance rate, and the decrease in applications (calculated against admitted students for the acceptance rate variable), it is reasonable to conclude that test-optional policy implementation affects acceptance rates.

Chapter V: Discussion

Qualitative and Quantitative Results Summary and Explanations of Findings

The outcome of the qualitative research demonstrated variation in test-optional policy rationalization and variation in availabilty of information. Through the process of data condensation and data display, nine rationale themes emerged and observations were recorded. The data was analyzed for frequency to answer the following research question: How do institutions rationalize their test-optional policies? It is plausible, based on inductive reasoning, to infer that the majority of national institutions frame their policies on "academic reflection," detailed as allowing applicants to submit admission materials that best demonstrate or predict academic success, which may not be projected accurately on standardized tests. It is also plausible to conclude that "institutional use" is the least common test-optional policy framework. The rationale theme "improve access" was nearly equal to the mean number of observed themes, and "improve diversity" was slightly above the median.

Based on the vast amount of literature and publicity on improving access and diversity by means of test-optional implementation, the a priori assumption for this analysis was that access or diversity improvement would emerge as the most frequent rationalization. While improving access and diversity themes were not the most frequent, they were observed four times together with "academic reflection." The qualitative outcome from this analysis is not absolute, rather it is open to infer additional conclusions and theoretical implications. Overt, publicized frameworks may not operate in isolation and may indirectly impact other test-optional rationales. For example, it is plausible to infer that the framework "academic reflection" as a manifest function (prevalent, publicized motive) could also fulfill a latent function (unpublicized motive) such as to improve access. In other words, as test-optional institutions place greater emphasis on academic accomphishments, there is less emphasis on test scores. Therefore, applicants without the

financial means for test preparation or the opportunity to "superscore" their ACT/SAT results may have greater access to the pursuit of post-secondary education via test-optional admissions.

While the qualitative analysis inferred that "improving access" was not the most frequent theme, the regression results for Pell Grant recipients in the quantitative analysis do infer that test-optional policies improve access for applicants with financial challenges. A working hypothesis to further this qualitative research could inquire whether an institution's rationalization fulfills a manifest or latent function and whether the fulfillment aligns with quantitative results.

Further, my interpretation of policies with conditions that exclude homeschooled students or those with GED or narrative transcripts are contradictory to "improving access" as a strategic goal. For example, George Washington University (GW) reported the following on their undergraduate admissions webpage: "This [test-optional] policy aligns with our admissions philosophy of holistic review, supports the university strategic plan on access, reflects the most current data analysis regarding the use of testing in admission and is clear and easy to communicate and understand" (George Washington University, 2020). In this example, GW referenced the test-optional policy as supporting their strategic plan on access, yet the policy excludes homeschooled applicants and those with narrative transcripts. The most recent data from NCES reported that the number of U.S. 9th through 12th grade equivalent homeschooled students in 2016 was approximately 525,000 (NCES, 2018a). NCES also reported the number of passing GEDs in 2013 as 540,535, and the number of passing HiSETs and TASCs in 2015 as 27,318 and 26,060 respectively (NCES, 2018b). While test-optional policies with conditions may affect a small number of applicants, in my opinion the conditions are not inclusive and therefore do not support the rationale of improving access.

Qualitative analysis is interpretive, and I acknowledge that the conclusion drawing for this research is a result of interpreting rationale themes, definitions, and patterns from uncategorized information. The purpose of this analysis was to fill a gap in the qualitative literature by presenting the results of a procedural, summative evaluation. Also, the findings may raise awareness about the type of institutional messaging made available to the public and the interpretation of such information. Lastly, the findings may prompt further dialogue and serve as a foundation for future studies.

The outcome of the quantitative research demonstrated significant results with respect to the enrollment of Pell Grant recipients, institutional acceptance rates, first-time undergraduate enrollment, and two URM groups—Hispanic or Latino and Native Hawaiian or Other Pacific Islander. As referenced in the chapters above, past literature has inferred various effects of test-optional policy implementation on applicant pools, admitted students, URM enrollment, Pell Grant recipient enrollment, and acceptance rates. The results of this study provided answers to the research questions: How do institutions rationalize their test-optional policies? To what extent does test-optional policy implementation affect the number of admitted students and applications? How are institutional acceptance rates affected? To what extent does test-optional policy implementation affect the enrollment of Pell Grant recipients and underrepresented minority students? The results suggest that test-optional policy implementation has little impact on the number of admitted students; minimally decreases the applicant pool, thus impacting the increase in acceptance rates; and significantly increases the enrollment of first-time undergraduates, Pell Grant recipients, Hispanic or Latino total enrollment, and Native Hawaiian or Other Pacific Islander first-time undergraduate enrollment.

To some degree this study converges with the prior research of Hiss and Franks (2014), Maguire (2018), and Syverson et al. (2018), which demonstrated significant increases in URM and Pell Grant recipient enrollment. However, this study diverges from the findings of Belasco et al. (2014) and my hypothesis. The results of this research demonstrated a decrease in the number of applications, whereas Belasco et al. (2014) reported an increase in applicants. Uniquely, this study infers an increase in first-time undergraduates, the financially disadvantaged group, two underrepresented groups, and an increase in the institutional acceptance rate. Perhaps the explanation for the enrollment increases in the undergraduate, Pell, and URM groups is a result of the sample population. The national institutions selected for this research compared to those in Belasco et al. (2014) have the capacity to increase enrollment, as national schools are generally larger than liberal arts colleges. Further, the mean undergraduate enrollment for the institutions in this study was 27,000, whereas the liberal arts colleges sampled in Belasco et al. (2014) enrolled no more than 3,000 undergraduate students.

The theoretical implications suggest that this study satisfied Merton's manifest function of social action—the intended factor that motivates institutions to implement a test-optional policy is to diversify enrollment. This study did not fulfill a latent function of improving selectivity as the acceptance rates increased. In relation to the Belasco et al. (2014) findings, the latent function for this study was not entirely actualized, as applications decreased. In summary, implications of the findings suggest that significant positive correlations exists between test-optional policy implementation and the enrollment of first-time undergraduates, Pell Grant recipients, Hispanic or Latino total enrollment, Native Hawaiian or Other Pacific Islander first-time undergraduate enrollment, and institutional acceptance rates.

Recommendations for Future Research

The researchers in the reports, articles, and theories referenced in this literature review contributed rich dialogue and provided interesting perspectives on the test-optional movement. Within the landscape of many different institutions serving millions of students, the research seems to confirm that neither test-optional nor test-requiring admissions is a "one-size-fits-all" solution. Institutions must proceed with policies most suitable for their constituents. The researchers presented above reported a range of outcomes and viewpoints. They proved that the test-optional movement is vibrant with historical data and current debates, and replete with topics to examine further. The limitations of this study and previous research suggest that gaps in the literature still remain. To fill such gaps, I recommend the following for future research:

- Homeschooled students and high school equivalency diploma recipients: As these students have nontraditional learning environments and nonstandard transcripts, there may be some concern about biased grades, strength of curriculum, and/or reliability of equivalency tests. These concerns may motivate institutions to continue the use of ACT/SAT for homeschooled and GED applicants. As noted above, 71% of institutions in this study have test-optional policies that exclude homeschooled students and those with a narrative transcript or GED. While the information emerged as a limitation for this study, it can be used to prompt future research to strengthen or challenge the application requirements for homeschooled and GED students.
- Admissions staff perspectives on the test-optional movement: Many test-optional policies require supplementary application documents such as substantive writing portfolios, in-depth review of high school classes, and letters of recommendation, as well as time to interview applicants. This holistic evaluation of applicants may increase the workload for admissions offices. Presently, research is not available regarding the perspectives of

admissions staff on test-optional implementation and use of holistic review. Also, data on admissions staff training, workload, satisfaction, and the retention of employees may prepare prospective test-optional schools and address a literature gap.

- Additional theoretical frameworks: This study was guided by Merton's manifest and latent functions of social action, and referenced Gardner's multiple intelligences theory and Sternberg's successful intelligence theory. These frameworks were appropriate for this research; however, the review of other psychological theories such as Daniel Goleman's (1998) mixed model of emotional intelligence and Hossler and Gallagher's (1987) three-phase model of college choice may provide greater understanding of the student profile to optimize admissions policies.
- High school grading inconsistencies: As referenced in the arguments above, Laird (2005) and Gershenson (2018) cautioned about the use of test-optional admissions materials due to the lack of HSGPA standardization. High school curriculum (availability and rigor) and grading procedures differ across classrooms, districts, counties, and states, therefore presenting concern about removing standardized tests for admissions. Additional research on this topic will strengthen or challenge the previous testing debates.
- Unknown data: The number of test-optional applicants compared to the number of test-submitters for the sample group in this study is unknown. Also, the percentage of applicants needed for an institution to qualify as "test-optional" is unknown. I recommend the collection of this type of data from admissions offices to address these gaps and further the test-optional dialogue.

Conclusion

This study referenced the advantages and disadvantages of test-optional policies and the concept of augmenting the ACT/SAT. The three positions have many strengths and weaknesses

including the prospect of increasing access and diversity; concerns about grade inflation and unstandardized application materials; test preparation and test-taking financial disparities; and the rationalization of assessing multiple intelligences for holistic admissions. Though the opportunities and challenges for each position are significant and vary widely, there is an outstanding element to the argument: option. As institutions continue to investigate alternative admissions procedures and policies that best suit their strategic goals, new options will arise. Options to either employ standardized measures, eliminate test scores, or augment criteria have an outstanding beneficiary: the applicant pool. The availabilty of options will assist applicants in search of the most appropriate admissions evaluation based on their own reflection of cognitive, analytical, practical, and creative skills. The development of admissions options will be fascinating to follow.

I look forward to dialogue that will expand, debate, or strengthen the findings of this study. I am especially interested in future research from the perspectives of students and admissions offices. Students are essentially the core of higher education and the offices of admissions are tasked with the evaluation and establishment of each new class. As students and admissions offices are directly associated with test-optional policies, I believe it is imperative to include their perspectives when implementing or managing admissions changes.

I also look forward to future studies in other admissions arenas such as graduate, law, business, medical, and engineering schools. Research on graduate test-optional admissions policies, popularly identified on Twitter as #GREexit, will fill a test-optional literature gap. Elements of this study may be duplicated to investigate graduate school test-optional admissions compared to schools requiring the following standardized examinations: Graduate Record Exam (GRE), Miller's Analogy Test (MAT), Law School Admission Test (LSAT), Graduate

Management Admission Test (GMAT), Medical College Admission Test (MCAT), and Graduate Aptitude Test in Engineering (GATE). While this study featured national undergraduate institutions, it will serve as a foundation for future studies featuring regional institutions, graduate institutions, and the perspectives of students and admissions staff. Such contributions will be fine additions to test-optional admissions policy evaluation, implementation, and practice.

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Appendix A

Classification of Institutions

Category	Count
Institution Type	
Private	39
Public	31
Undergraduate Enrollment	
Fewer than 3,000 students	12
3,000 to 9,999	27
More than 10,000	31
2020 U.S. News Best Colleges	
Acceptance Rate	
Fewer than 50% of applicants admitted	10
50% to 70%	21
71% to 85%	32
More than 85%	7
2020 U.S. News Best Colleges	
National Universities Rankings	
1 to 100	17
101 to 200	26
201 to 281	27

Note. The categorization was modeled from NACAC (2018). The acceptance rates and ranking positions were collected from the *2020 U.S. News & World Report Best Colleges* rankings (U.S. News & World Report, 2019).

Appendix B

Qualitative Sample: Test-Optional Institutions

Qualitative Sample: Test-Optional Institutions

National College/University- Campus if applicable (State)	U.S. News 2020 Rank
University of Chicago (IL)	#6 (tie)
Wake Forest University (NC)	#27
New York University (NY)	#29 (tie)
University of Rochester (NY)	#29 (tie)
Brandeis University (MA)	#40 (tie)
The University of Texas- Austin (TX)	#48 (tie)
Worcester Polytechnic Institute (MA)	#64 (tie)
George Washington University (DC)	#70 (tie)
Texas A&M University- College Station (TX)	#70 (tie)
American University (DC)	#77 (tie)
Indiana University- Bloomington (IN)	#79 (tie)
Marquette University (WI)	#84 (tie)
Clark University (MA)	#91 (tie)
University of Delaware (DE)	#91 (tie)
Drexel University (PA)	#97 (tie)
University of Denver (CO)	#97 (tie)
University of San Francisco (CA)	#97 (tie)
Creighton University (NE)	#104 (tie)

National College/University- Campus if applicable (State)	U.S. News 2020 Rank
Temple University (PA)	#104 (tie)
Arizona State University- Tempe (AZ)	#117 (tie)
University of Arizona (AZ)	#117 (tie)
DePaul University (IL)	#125 (tie)
University of New Hampshire- Main Campus (NH)	#125 (tie)
Drake University (IA)	#130 (tie)
Duquesne University (PA)	#132 (tie)
University of LaVerne (CA)	#132 (tie)
Catholic University of America (DC)	#139 (tie)
University of Saint Joseph (CT)	#147 (tie)
The University of Texas- Dallas (TX)	#147 (tie)
George Mason University (VA)	#153 (tie)
The New School (NY)	#153 (tie)
Quinnipiac University (CT)	#153 (tie)
Hofstra University (NY)	#162(tie)
Kansas State University (KS)	#162 (tie)
Virginia Commonwealth University (VA)	#162 (tie)
Montclair State University (NJ)	#166 (tie)
Rowan University (NJ)	#166 (tie)
St. John's University (NY)	#179 (tie)
University of Massachusetts- Lowell (MA)	#179 (tie)

National College/University- Campus if applicable (State)	U.S. News 2020 Rank
Chatham University (PA)	#185 (tie)
University of Houston (TX)	#185 (tie)
Ball State University (IN)	#192 (tie)
Bellarmine University (KY)	#197 (tie)
Maryville University of Saint Louis (MO)	#202 (tie)
Pace University (NY)	#202 (tie)
California State University- Fresno (CA)	#211 (tie)
Immaculata University (PA)	#211 (tie)
Mississippi State University (MS)	#211 (tie)
University of Hartford (CT)	#211 (tie)
Hampton University (VA)	#218 (tie)
Sacred Heart University (CT)	#218 (tie)
Texas Tech University (TX)	#218 (tie)
University of Massachusetts- Dartmouth (MA)	#218 (tie)
Western New England University (MA)	#218 (tie)
Azusa Pacific University (CA)	#228 (tie)
Indiana University- Purdue University (IN)	#228 (tie)
The Sage Colleges (NY)	#228(tie)
University of Massachusetts – Boston (MA)	#228 (tie)
Lesley University (MA)	#246 (tie)
University of New England (MA)	#246 (tie)

National College/University- Campus if applicable (State)	U.S. News 2020 Rank
The College of St. Scholastica (MN)	#254 (tie)
Southern Illinois University- Carbondale (IL)	#254 (tie)
Daemen College (NY)	#263 (tie)
Old Dominion University (VA)	#263 (tie)
University of Missouri- Kansas City (MO)	#263 (tie)
University of South Dakota (SD)	#263 (tie)
South Dakota State University (SD)	#272 (tie)
Tennessee Technological University (TN)	#272 (tie)
Sam Houston State University (TX)	#281 (tie)
University of North Texas (TX)	#281 (tie)

Note. This list is inclusive of institutions with test-optional and test-flexible policy implementation dates spanning from 1995 to 2021. The ranking positions were collected from the *2020 U.S. News & World Report Best Colleges* rankings (U.S. News & World Report, 2019).

Appendix C

Quantitative Treatment Group: Test-Optional Institutions

Quantitative Treatment Group: Test-Optional Institutions

National College/University- Campus if applicable (State)	U.S. News 2020 Rank	Test-Optional or Test-Flexible Adoption Year
Wake Forest University (NC)	#27	2009
New York University (NY)	#29 (tie)	2010
University of Rochester (NY)	#29 (tie)	2012
Brandeis University (MA)	#40 (tie)	2013
Worcester Polytechnic Institute (MA)	#64 (tie)	2007
George Washington University (DC)	#70 (tie)	2015
American University (DC)	#77 (tie)	2009
Clark University (MA)	#91 (tie)	2012
Temple University (PA)	#104 (tie)	2014
Drake University (IA)	#130 (tie)	2015
Duquesne University (PA)	#132 (tie)	2014
Catholic University of America (DC)	#139 (tie)	2015
University of Saint Joseph (CT)	#147 (tie)	2015
George Mason University (VA)	#153 (tie)	2006
The New School (NY)	#153 (tie)	2007
Hofstra University (NY)	#162(tie)	2014
Virginia Commonwealth University (VA)	#162 (tie)	2015

National College/University- Campus if applicable (State)	U.S. News 2020 Rank	Test-Optional or Test-Flexible Adoption Year
Montclair State University (NJ)	#166 (tie)	2015
Rowan University (NJ)	#166 (tie)	2015
University of Massachusetts – Lowell (MA)	#179 (tie)	2015
Chatham University (PA)	#185 (tie)	2006
Maryville University of St. Louis (MO)	#202 (tie)	2015
Hampton University (VA)	#218 (tie)	2014
Sacred Heart University (CT)	#218 (tie)	2009
Western New England University (MA)	#218 (tie)	2015
The Sage Colleges (NY)	#228(tie)	2010
Daemen College (NY)	#263 (tie)	2009
Old Dominion University (VA)	#263 (tie)	2014

Note. This list is inclusive of institutions with test-optional and test-flexible policy implementation dates during the regression parameters, 2005-2016. The ranking positions were collected from the *2020 U.S. News & World Report Best Colleges* rankings (U.S. News & World Report, 2019).

Appendix D

Quantitative Control Group: Test-Requiring Institutions

Quantitative Control Group: Test-Requiring Institutions

National College/University- Campus if applicable (State)	U.S. News 2020 Rank
Carnegie Mellon University (PA)	#25 (tie)
University of Michigan- Ann Arbor (MI)	#25 (tie)
University of Virginia- Main Campus (VA)	#28
Georgia Institute of Technology- Main Campus (GA)	#29 (tie)
Tufts University (MA)	#29 (tie)
University of North Carolina at Chapel Hill (NC)	#29 (tie)
University of California- Santa Barbara (CA)	#34 (tie)
University of Florida (FL)	#34 (tie)
University of California- Irvine (CA)	#36
Boston College (MA)	#37 (tie)
University of California- San Diego (CA)	#37 (tie)
University of California- Davis (CA)	#39
Boston University (MA)	#40 (tie)
Case Western Reserve University (OH)	#40 (tie)
College of William and Mary (VA)	#40 (tie)
Northeastern University (MA)	#40 (tie)
Tulane University (LA)	#40 (tie)
University of Wisconsin- Madison (WI)	#46 (tie)

National College/University- Campus if applicable (State)	U.S. News 2020 Rank
Villanova University (PA)	#46 (tie)
University of Illinois at Urbana- Champaign (IL)	#48 (tie)
Lehigh University (PA)	#50 (tie)
Pepperdine University (CA)	#50 (tie)
Rensselaer Polytechnic Institute (NY)	#50 (tie)
University of Georgia (GA)	#50 (tie)
Ohio State University- Main Campus (OH)	#54 (tie)
Santa Clara University (CA)	#54 (tie)
Syracuse University (NY)	#54 (tie)
Florida State University (FL)	#57 (tie)
Pennsylvania State University- Main Campus (PA)	#57 (tie)
Purdue University- Main Campus (IN)	#57 (tie)
University of Miami (FL)	#57 (tie)
University of Pittsburgh- Pittsburgh Campus (PA)	#57 (tie)
Rutgers University- New Brunswick (NJ)	#62 (tie)
University of Washington- Seattle Campus (WA)	#62 (tie)
Loyola Marymount University (CA)	#64 (tie)
Southern Methodist University (TX)	#64 (tie)
University of Connecticut (CT)	#64 (tie)
University of Maryland- College Park (MD)	#64 (tie)
University of Massachusetts- Amherst (MA)	#64 (tie)

National College/University- Campus if applicable (State)	U.S. News 2020 Rank
Clemson University (SC)	#70 (tie)
University of Minnesota- Twin Cities (MN)	#70 (tie)
Fordham University (NY)	#74 (tie)
Stevens Institute of Technology (NJ)	#74 (tie)
Virginia Polytechnic Institute and State University (VA)	#74 (tie)
Brigham Young University- Provo (UT)	#77 (tie)
Baylor University (TX)	#79 (tie)
Binghamton University- SUNY (NY)	#79 (tie)
Gonzaga University (WA)	#79 (tie)
Indiana University- Bloomington (IN)	#79 (tie)
University at Buffalo- SUNY (NY)	#79 (tie)
Colorado School of Mines (CO)	#84 (tie)
Elon University (NC)	#84 (tie)
Marquette University (WI)	#84 (tie)
Michigan State University (MI)	#84 (tie)
North Carolina State University at Raleigh (NC)	#84 (tie)
University of California- Santa Cruz (CA)	#84 (tie)
University of Iowa (IA)	#84 (tie)
Miami University- Oxford (OH)	#91 (tie)
Stony Brook University- SUNY (NY)	#91 (tie)
University of California- Riverside (CA)	#91 (tie)

National College/University- Campus if applicable (State)	U.S. News 2020 Rank
University of San Diego (CA)	#91 (tie)
New Jersey Institute of Technology (NJ)	#97 (tie)
Saint Louis University (MO)	#97 (tie)
Texas Christian University (TX)	#97 (tie)
University of Denver (CO)	#97 (tie)
University of San Francisco (CA)	#97 (tie)
Yeshiva University (NY)	#97 (tie)
Auburn University (AL)	#104 (tie)
Howard University (DC)	#104 (tie)
Loyola University Chicago (IL)	#104 (tie)
Rochester Institute of Technology (NY)	#104 (tie)
University of California- Merced (CA)	#104 (tie)
University of Colorado- Boulder (CO)	#104 (tie)
University of Oregon (OR)	#104 (tie)
University of South Carolina- Columbia (SC)	#104 (tie)
University of South Florida- Main Campus (FL)	#104 (tie)
The University of Tennessee- Knoxville (TN)	#104 (tie)
University of Utah (UT)	#104 (tie)
Clarkson University (NY)	#117 (tie)
Illinois Institute of Technology (IL)	#117 (tie)
Iowa State University (IA)	#121 (tie)

National College/University- Campus if applicable (State)	U.S. News 2020 Rank
SUNY College of Environmental Science and Forestry (NY)	#121 (tie)
University of Tulsa (OK)	#121 (tie)
University of Vermont (VT)	#121 (tie)
Chapman University (CA)	#125 (tie)
DePaul University (IL)	#125 (tie)
Simmons University (MA)	#125 (tie)
University of New Hampshire- Main Campus (NH)	#125 (tie)
University of the Pacific (CA)	#125 (tie)
University of Kansas (KS)	#130 (tie)
Rutgers University- Newark (NJ)	#132 (tie)
University of Dayton (OH)	#132 (tie)
University of Illinois at Chicago (IL)	#132 (tie)
University of Kentucky (KY)	#132 (tie)
University of LaVerne (CA)	#132 (tie)
University of Oklahoma- Norman Campus (OK)	#132 (tie)
Oregon State University (OR)	#139 (tie)
Seattle University (WA)	#139 (tie)
Seton Hall University (NJ)	#139 (tie)
University of Cincinnati- Main Campus (OH)	#139 (tie)
University of Missouri- Columbia (MO)	#139 (tie)
University of Nebraska- Lincoln (NE)	#139 (tie)

National College/University- Campus if applicable (State)	U.S. News 2020 Rank
University of St. Thomas (MN)	#139 (tie)
Michigan Technological University (MI)	#147 (tie)
Samford University (AL)	#147 (tie)
San Diego State University (CA)	#147 (tie)
University at Albany- SUNY (NY)	#147 (tie)
Louisiana State University (LA)	#153 (tie)
Mercer University (GA)	#153 (tie)
Thomas Jefferson University (PA)	#153 (tie)
The University of Alabama (AL)	#153 (tie)
University of Arkansas (AR)	#153 (tie)
Valparaiso University (IN)	#153 (tie)
University of Mississippi (MS)	#162 (tie)
Adelphi University (NY)	#166 (tie)
Belmont University (TN)	#166 (tie)
Colorado State University- Fort Collins (CO)	#166 (tie)
Rutgers University- Camden (NJ)	#166 (tie)
Saint John Fisher College (NY)	#166 (tie)
University of Alabama at Birmingham (AL)	#166 (tie)
University of Central Florida (FL)	#166 (tie)
University of Hawaii at Manoa (HI)	#166 (tie)
University of Maryland- Baltimore County (MD)	#166 (tie)

National College/University- Campus if applicable (State)	U.S. News 2020 Rank
University of Rhode Island (RI)	#166 (tie)
Washington State University (WA)	#166 (tie)
Gallaudet University (DC)	#179 (tie)
Missouri University of Science and Technology (MO)	#179 (tie)
University of Detroit Mercy (MI)	#179 (tie)
University of Idaho (ID)	#179 (tie)
Biola University (CA)	#185 (tie)
Ohio University- Main Campus (OH)	#185 (tie)
Pacific University (OR)	#185 (tie)
Union University (TN)	#185 (tie)
University of North Carolina- Wilmington (NC)	#185 (tie)
Misericordia University (PA)	#192 (tie)
Oklahoma State University- Main Campus (OK)	#192 (tie)
Seattle Pacific University (WA)	#192 (tie)
University of Louisville (KY)	#192 (tie)
Bellarmine University (KY)	#197 (tie)
Bethel University (MN)	#197 (tie)
Illinois State University (IL)	#197 (tie)
Loyola University New Orleans (LA)	#197 (tie)
Towson University (MD)	#197 (tie)
Edgewood College (WI)	#202 (tie)

National College/University- Campus if applicable (State)	U.S. News 2020 Rank
Florida Institute of Technology (FL)	#202 (tie)
Pace University (NY)	#202 (tie)
Regis University (CO)	#202 (tie)
Robert Morris University (PA)	#202 (tie)
University of Maine (ME)	#202 (tie)
University of St. Francis (IL)	#202 (tie)
Widener University (PA)	#202 (tie)
Georgia State University (GA)	#211 (tie)
Kent State University (OH)	#211 (tie)
Wilkes University (PA)	#211 (tie)
Clarke University (IA)	#218 (tie)
Florida International University (FL)	#218 (tie)
Gannon University (PA)	#218 (tie)
Lipscomb University (TN)	#218 (tie)
University of New Mexico- Main Campus (NM)	#218 (tie)
CUNY City College (NY)	#228 (tie)
East Carolina University (NC)	#228 (tie)
Indiana University- Purdue University (IN)	#228 (tie)
St. Catherine University (MN)	#228 (tie)
University of Indianapolis (IN)	#228 (tie)
University of North Carolina at Charlotte (NC)	#228 (tie)

National College/University- Campus if applicable (State)	U.S. News 2020 Rank
University of Wyoming (WY)	#228 (tie)
West Virginia University (WV)	#228 (tie)
Central Michigan University (MI)	#240 (tie)
Harding University (AR)	#240 (tie)
Long Island University (NY)	#240 (tie)
Oklahoma City University (OK)	#240 (tie)
University of Findlay (OH)	#240 (tie)
University of Nevada- Reno (NV)	#240 (tie)
Bowling Green State University- Main Campus (OH)	#246 (tie)
George Fox University (OR)	#246 (tie)
Lesley University (MA)	**#246 (tie)**
Montana State University (MT)	#246 (tie)
Nova Southeastern University (FL)	#246 (tie)
Western Michigan University (MI)	#246 (tie)
Baker University (KS)	#254 (tie)
D'Youville College (NY)	#254 (tie)
Florida Agricultural and Mechanical University (FL)	#254 (tie)
Lincoln Memorial University	#254 (tie)
Southern Illinois University- Carbondale (IL)	#254 (tie)
The University of Montana (MT)	#254 (tie)
University of Colorado- Denver Campus/Anschutz Medical Campus (CO)	#254 (tie)

National College/University- Campus if applicable (State)	U.S. News 2020 Rank
Utah State University (UT)	#254 (tie)
New Mexico State University- Main Campus (NM)	#263 (tie)
Shenandoah University (VA)	#263 (tie)
University of Alabama in Huntsville (AL)	#263 (tie)
University of Alaska- Fairbanks (AK)	#263 (tie)
University of Missouri- Kansas City (MO)	#263 (tie)
University of North Dakota (ND)	#263 (tie)
Campbell University (NC)	#272 (tie)
Louisiana Tech University (LA)	#272 (tie)
Mary Baldwin University (VA)	#272 (tie)
Tennessee Technological University (TN)	#272 (tie)
University of Memphis (TN)	#272 (tie)
University of North Carolina at Greensboro (NC)	#272 (tie)
University of the Incarnate Word (TX)	#272 (tie)
Concordia University- Wisconsin (WI)	#281 (tie)
Dallas Baptist University (TX)	#281 (tie)
Florida Atlantic University (FL)	#281 (tie)
Gardner-Webb University (NC)	#281 (tie)
North Carolina Agricultural and Technical State University (NC)	#281 (tie)
North Dakota State University (ND)	#281 (tie)
Regent University (VA)	#281 (tie)

National College/University- Campus if applicable (State)	U.S. News 2020 Rank
University of Missouri- St. Louis (MO)	#281 (tie)
University of North Florida (FL)	#281 (tie)
William Carey University (MS)	#281 (tie)

Note. The institutions listed were not test-optional during the panel timespan, 2004-2018. Fourteen institutions (in bold) transitioned to test-optional after 2018. The ranking positions were collected from the *2020 U.S. News & World Report Best Colleges* rankings (U.S. News & World Report, 2019).

Appendix E

Tabulation of Test-Requiring and Test-Optional Institutions, 2004-2018

Year 2004-2018	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Test-requiring	252	252	250	248	248	244	242	242	240	239	234	224	221	216	209
Test-optional	0	0	2	4	4	8	10	10	12	13	18	28	31	36	43
Total															252

Appendix F

Matrix of Correlations: Institutional Expenditure Variables (Controls)

Variables per FTE	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Average grant award	1.000									
(2) Average tuition*	0.677	1.000								
(3) Academic support	0.249	0.298	1.000							
(4) Endowment assets	0.377	0.380	0.365	1.000						
(5) Instructional support	0.312	0.399	0.626	0.482	1.000					
(6) Institutional support	0.424	0.485	0.453	0.361	0.568	1.000				
(7) Public service	-0.107	-0.117	0.257	0.214	0.300	0.005	1.000			
(8) Research	-0.068	-0.172	0.356	0.289	0.438	0.076	0.532	1.000		
(9) Student service	0.414	0.541	0.348	0.220	0.359	0.463	-0.044	-0.031	1.000	
(10) Other core expense	-0.365	-0.479	-0.066	-0.080	-0.022	-0.188	0.275	0.350	-0.273	1.000

Note. FTE = full-time equivalency.

* In-state, undergraduate tuition