The Test-Optional Puzzle

By Wouter Dessein and Alex Frankel and Navin Kartik*

Even prior to the Covid-19 pandemic, there was a trend in US colleges making standardized test scores optional for undergraduate applicants. In 2019, one third of the 900+ colleges that accepted the Common Application did not require test scores.[1]

Colleges often state that the purpose of test-optional policies is to help enroll a more diverse class. They argue that de-emphasizing tests avoids disadvantaging students groups—including underrepresented minorities—who score lower on standardized tests. For instance, when University of Michigan announced in February 2024 that it would adopt a test-optional policy for the indefinite future, a vice provost stated: "Our commitment today to a test-optional policy for undergraduate admissions demonstrates our focus on providing access to high-achieving students from all backgrounds."

We find this argument puzzling. Regardless of a (rational) economic agent's objectives, more information should help their decision making. In particular, colleges can choose how much weight to put on tests, and how to adjust test scores for students from different circumstances and backgrounds.[2] Wouldn't a college be better off observing students' scores and deciding how to use them, rather than letting some students not submit scores?

This article formalizes the point via a simple "impossibility result": under certain assumptions, a test-mandatory policy is always (weakly) better for the college. To prove that result, we show that a test-mandatory college can replicate any outcome it could obtain under test optional. Our argument will be straightforward to an economic theorist, as it has the flavor of a "revelation principle" familiar from mechanism design. But we believe there is value in articulating a set of assumptions that assure the result in the present context. In particular, the result holds even when score distributions differ across student groups, students can exert hidden effort towards improving their scores, and when effort costs are unobservably heterogeneous across students.

One interpretation of our impossibility result is that test-optional policies are a mistake (pandemics notwithstanding). Indeed, some colleges have reverted to test mandatory after the Covid-19 pandemic. Another interpretation is that the result sheds light on what is needed to rationalize such policies. We discuss some such considerations in the latter part of the paper.

I. The Impossibility Result

For clarity, we formulate the problem as one of a single student applying to a single college. The logic extends to many students applying to many colleges.

* Dessein: Columbia University, Graduate School of Business (email: wd2179@columbia.edu). Frankel: University of Chicago, Booth School of Business (email: afrankel@chicagobooth.edu). Kartik: Columbia University, Department of Economics (email: nkartik@columbia.edu). We thank Akila Weerapana for helpful comments.

[1] While we emphasize undergraduate admissions, the test-optional movement ranges from kindergarten to graduate school (Forbes magazine, 2022).

[2] The explicit consideration of race in the college admissions process was banned nationwide by the Supreme Court in June 2023, in *Students for Fair Admissions v. Harvard*. But colleges are still allowed to adjust scores based on high school neighborhoods. Indeed, a 2024 Dartmouth report states that "Dartmouth Admissions uses SAT scores within context; a score of 1400 for an applicant from a high school in a lower-income community with lower school-wide test scores is a more significant achievement than a score of 1400 for an applicant from a high school in a higher-income community with higher school-wide test scores."

Model

We are interested in three alternative testing regimes: *test mandatory*, *test optional*, and *test blind*. Under test mandatory, if the student applies to the college, they must submit their standardized test score. Under test optional, the student chooses whether to submit their score. Under test blind, the student cannot submit their score. Given a testing regime, the college publicly commits to an *admission policy*, which—as detailed below—consists both of a message space and a mapping from everything it observes about the student to a probability of admission.

Given a testing regime and admission policy, the student faces the following decision problem:

1) The student's exogenous characteristics, denoted by $x \equiv (z, q)$, are stochastically realized.

   We view the variable q as quality/ability, which is not directly observable to either the college or the student, although each may assess that through correlation with other variables they do observe.

   The variable z captures student characteristics that are known to the student. We think of these characteristics as having both "public" and "private" components. That is, some student features will be seen by the college in the student's application: GPA and other measures of classroom performance, extracurricular achievements, legacy status, etc. Others are known by the student but are never directly observed by the college: family wealth or aspects of the student's interests and upbringing, say. Features such as race or socioeconomic status might or might not be seen by the college, depending on what information it collects on its application.

   To accommodate the range of possibilities, we formally assume the student observes only the component z of x, whereas the college does not observe any component of x. Any information the college has about x will be summarized in a signal—which can reveal arbitrary components of x—described in point (5) below.

2) The student chooses effort e, which is not directly observed by the college. We think of e as effort towards preparation for a standardized test, although it can also capture actions that affect other aspects of a student's application.

3) The student privately obtains a test score t, which can stochastically depend on the characteristics x and effort e.

4) The student chooses whether to apply to the college, $a \in \{0, 1\}$, where 1 denotes applying. If the student applies, then in the test-optional regime, the student chooses whether to disclose their test score t. The test score is automatically disclosed under test mandatory, and cannot be disclosed under test blind. The student may also send the college a supplementary "cheap talk" or payoff-irrelevant message m; the set of available messages is chosen by the college as part of its admission policy. We think of m as capturing responses to application questions concerning "soft" information.

5) If the student applies, the college observes a stochastic signal h—which we refer to as a "holistic" signal—that can depend on the preceding exogenous and endogenous variables (x, e, t, and m). The signal h captures everything the college observes beyond the test score and the student's supplementary message. Among other things, h can subsume recommendation letters, the college's assessment of the student's match, etc.

6) Finally, if the student applies, admission is determined by the college's admission policy, which maps h, t (if disclosed), and m into an admission probability.

Let o be a binary variable indicating whether the student is admitted by the college. The student's preferences are given by two utility functions: one if they apply,

which can depend on (x, e, t, h, o), and another if they don't, which can depend on (x, e, t). The college's utility is normalized to 0 if the student does not apply and is some function of (x, e, t, h, o) if the student applies.

These preference assumptions rule out either party's utility depending directly on the testing regime or admission policy, and on whether the student discloses their score or which supplementary message they send. There is also, implicitly, no cost to generating a (possibly very low) test score. Otherwise, our formulation is quite general. In particular, the student's cost of improving their test score (i.e., exerting effort e) and the score distribution conditional on effort can vary with the student's characteristics (x), in ways that are either observable or unobservable to the college. On the college's side, it could care about whether the student applies even if it will reject the student, and factors like preferences over yield (how likely the student is to matriculate) can be subsumed by making yield a component of the holistic signal h.

We assume the student knows all the relevant stochastic distributions (i.e., of x, t, and h), and that none of those distributions depends on either the testing regime or the admission policy. Given any regime and policy, the student best responds, i.e., chooses their (possibly randomized) actions at steps (2) and (4) in the sequence above to maximize their expected utility.[3]

Result

We will show below that for any test-optional admissions policy, there exists a test-mandatory admissions policy that "replicates" it: this test-mandatory policy leads to the same outcomes of student effort e, distribution of test scores t, student application choice a, distribution of holistic signal h, and admission probability. The college is then exactly as well off under the replicating test-mandatory policy. (This is true even if the college cares intrinsically about the size of its "applicant pool", i.e., directly about whether the student applies.) Hence, the replication result implies our central point that for any test-optional policy there is some test-mandatory policy—which need not be a replication—that makes the college (weakly) better off. An analogous point holds for why the college is better off under test optional, and hence also test mandatory, than test blind.

Formally, we say that an admission policy α' (in some testing regime) *replicates* another admission policy α (in a possibly different regime) if:

i) the set of student-optimal effort and application decision pairs (e, a) are the same under both policies; and

ii) given any optimal (e, a), and any optimal supplementary message m under α, there is an optimal message m' under α' such that for any realizations of the student characteristics x, test score t, and holistic signal h, the student's probability of admission under both policies is the same.

PROPOSITION 1: *For any test-optional admission policy, there is a replicating test-mandatory policy. For any test-blind admission policy, there is a replicating test-optional policy.*

PROOF:

We first show how any test-optional admission policy can be replicated by some test-mandatory policy.

Take any test-optional admission policy with a message space M and admission probability function $\alpha(h, \hat{t}, m)$. Here, $\hat{t}$ is the test score t if submitted and null, denoted ϕ, otherwise. Consider a test-mandatory policy with message space $M' := M \times \{0, 1\}$ and admission probability function $\alpha'(h, t, m')$ given by $\alpha'(h, t, (m, 0)) := \alpha(h, \phi, m)$ and $\alpha'(h, t, (m, 1)) := \alpha(h, t, m)$. In other words, the college sets its test-mandatory admission probability equal to what a student with the same holistic signal, test score, and supplementary message *would have gotten* under the test-optional policy.

[3] In fact, it should become clear from the subsequent logic that expected utility is not essential.

The nuance is that the student is now also asked to indicate whether they would have submitted their score under test optional. Formally, this is the second component of their test-mandatory message m', with a 0 indicating nonsubmission under test optional and 1 indicating submission. The college's test-mandatory policy mimics the corresponding test-optional outcome.[4]

Thus defined, the test-mandatory policy ensures that the incentives for the student to choose effort, to apply, to choose the first component of their message m', and to (indicate whether they would) submit a test score are identical to those under the test-optional policy. It is thus a best response for the student to act the same as under test optional, and the outcome is replicated.

For the proposition's second statement, observe that a test-blind admission policy is replicated by a test-optional (or test-mandatory) policy that simply ignores any submitted test score and otherwise uses the same message space as under test blind and the same admission mapping, $(h, m) \mapsto [0, 1]$. ■

Note that a test-mandatory admissions policy might also be replicated by a test-optional policy that simply rejects any student who does not submit a test score. We do not consider this interesting because always rejecting students who do not submit scores defeats the spirit of test optional, as it is de facto test mandatory.

Let us reiterate that we do not propose that a college switching from test-mandatory to test-optional should attempt to design an admissions policy that replicates its test-optional outcomes. We would generally expect that the college, now observing additional test score information, can do even better with a non-replicating policy (so long as the test-optional policy was not already rejecting all nonsubmitters). Replication is a simple and general theoretical construction to make the point that, under our assumptions, a college cannot be harmed by being test mandatory.

That said, we do not interpret Proposition 1 as implying that colleges in the real world cannot benefit from going test optional or test blind. Rather, our model and result point us to the assumptions that must be violated for a college to in fact benefit from not observing test scores.

II. Ways Out of the Puzzle

We now turn to discussing how breaking some of Proposition 1's underlying assumptions might—or might not—lead the college to prefer test optional to test mandatory.

Lack of Commitment

Suppose the college lacks commitment power, and instead admits students according to what it finds ex-post optimal given the information provided. We expect that under reasonable monotonicity assumptions, the college still cannot do better under test optional than test mandatory. The logic is now quite different from that of Proposition 1, however. The issue now is that a test-optional policy unravels, as in classic voluntary-disclosure models (e.g., Paul R. Milgrom, 1981). Despite the college being nominally test optional, all students end up submitting their scores because not submitting will, in equilibrium, be met with the skepticism of a low score and hurt admission. Such unraveling suggests that a lack of college commitment power is unlikely, on its own, to explain why colleges might go test optional.[5]

[4] We only need the student to indicate whether they would have submitted under test optional if the college cannot perfectly predict that based on what else it observes. Albeit in a different model, Nathan Hancart (2024, Section 2.1) shows that a form of test optional can do strictly better than test mandatory in the absence of cheap talk; when cheap talk is permitted, however, there would be no benefit from going test optional.

[5] In practice, test-optional colleges see a significant fraction of their applicants not submitting scores; according to one source, 43% of students using the Common Application in 2022-23 did not submit scores. This may indicate that colleges' claims about how they will treat nonsubmitters are credible—for example that "applicants will not be penalized or put at a disadvantage if they choose not to submit SAT or ACT scores" (University of Southern California).

Additional Costs

We allowed for the students to have arbitrary type-dependent costs of studying for the test and of applying to the college. However, we did not allow for a direct cost of sitting for the test—formally, there was no (lower cost) option to not generate a test score—nor of submitting a test score. Adding either of these costs breaks the replication argument and can flip the result. A student who applies can avoid these costs only if the college is test optional or test blind. In the presence of such costs, colleges potentially face a genuine tradeoff: requiring test scores deters applications while yielding more information about students who do apply (cf. Nikhil Garg, Hannah Li and Faidra Monachou, 2021).[6]

There is, of course, a large cost of sitting for the test during a pandemic—even infinite, when test centers are shut down. Our view is that this cost is not otherwise particularly large.[7] (This test-sitting cost would be separate from any costs of studying and preparing for test, which we view as significant but are already part of the model.) That said, students may still perceive these costs as significant (cf. Sarena Goodman, 2016).

Non-equilibrium Behavior

The impossibility result can fail if students don't follow our predictions of equilibrium behavior. Students may make different application or test-preparation decisions when facing a test-optional college rather than a test-mandatory college with the same acceptance probabilities. For instance, colleges would certainly want to switch from test mandatory to test optional if many students happened to follow the behavioral rule that they will not apply to test-mandatory colleges.[8] Even a student who plans on taking the test and submitting their score to test-optional colleges might, for reasons of principle, be unwilling to apply to a test-mandatory college.

Signaling

In practice, students may try to infer a college's values from its admission policy. Being test optional could then be a credible signal that the college cares about diversity or about aspects of a student's character that can't be measured by tests.[9] Likewise, if students do not blindly trust admission policy pronouncements, then test optional could serve as a credible signal that the college will not put much weight on test scores.[10]

Constraints on Admission Rules

Our replication argument assumes that the college is able to choose any admission policy. If the college is instead constrained, the impossibility result could fail. As an extreme case, imagine that the college has no flexibility at all: it is required to evaluate students with a test score by one rule, and students without a test score by another rule. If the admission rule for students with test scores were to put too much weight on tests, the college might very well

[6] Relatedly, Yucheng Liang and Wenzhuo Xu (2024) suggest that "procedural fairness"—which they conceptualize as a reduced-form cost of observing test scores—may be a reason a college prefers to not see scores.

[7] For instance, the SAT takes about 3 hours to sit—about half a day of school, while a typical U.S. student is expected to go to school for about 180 days a year for 12 years prior to college. The SAT currently has a monetary cost of $60, but low income students in the US can get this fee waived; fee waivers are automatic for students eligible for federally subsidized school lunches. Students can then submit their SAT scores to four colleges at no cost and they pay $12 per submission after that, but again these fees are waived for low income students. (Fees link.)

[8] In the context of applications to graduate schools, Dr. Kim Yi Dionne, a professor at UC Riverside, writes on X (formerly Twitter): "Students at the minority-serving institution where I work are ABSOLUTELY taking schools off their list if they require the GRE."

[9] When George Washington University went test optional in 2015, a school official stated "We hope the test-optional policy *sends a message* to prospective students that if you are smart, hard-working and have challenged yourself in a demanding high school curriculum, there could be a place for you here." (emphasis added)

[10] Writing on Inside Higher Ed, David Blobaum pushes this logic even further: "If a college does not value SAT or ACT scores, then the college would not use those scores. It would be SAT/ACT-blind, not SAT/ACT-optional."

prefer not to see tests at all. Such an exogenous admission rule might be imposed by the government or by stakeholders with different preferences from the college.

The approach in Wouter Dessein, Alex Frankel and Navin Kartik (2024) of college decisions under social pressure is a milder form of constraints on admissions. In that model, the college is free to choose any admission policy it wants, but it faces costs of making admission decisions that a third party disagrees with. Not seeing scores allows the college to reduce disagreement, which can outweigh the loss of information.

Agency Issues

Admission policies may also be limited by a college's admissions officers. These officers might put more weight on test scores than the college seeks, owing to differences in preferences or beliefs. The salience of test scores may also subconsciously influence how officers process, interpret, or attend to other more subjective parts of an application. Finally, officers may put excess weight on test scores due to incentives and moral hazard: officers may only find it worthwhile to conduct a costly holistic assessment when they lose access to test scores.

Gaming Rankings

Finally, some commentators have suggested that colleges may go test optional simply to report higher average (submitted) standardized test scores, which mechanically improves their rankings from organizations like the U.S. News. Michael Conlin, Stacy Dickert-Conlin and Gabrielle Chapman (2013) provide evidence of strategic admission decisions by test-optional colleges to manipulate their rankings.

III. Conclusion

Many colleges state reasons for going test optional that boil down to a claim that they can make "better" decisions with less information. This paper makes a simple point: Even if test scores are correlated with unobservable student characteristics unrelated to college performance, and even if scores depend on hidden test prep behavior that disadvantages certain student groups, test-score information should still help colleges.

Of course, that conclusion requires assumptions. By making explicit a set of assumptions under which the result holds, and discussing how the result can fail when those assumptions are violated, we hope to have contributed to understanding why colleges may (or may not) actually benefit from test-optional admissions.

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