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How Powerful Are Promises? A Systematic Review of the Causal Mechanisms and Outcomes of "Free College" Programs in the United States

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Abstract

"Free college" (sometimes called Promise) programs are common in U.S. higher education. Reviewing 88 studies of 25 state and local programs, I provide a nuanced picture of the mechanisms through which these programs may work and their likely effects on students, communities, and colleges. Some commonly-claimed mechanisms for these effects—e.g., improving secondary school environments or impacting residential decisions—lack empirical support or are implausible for most existing programs. Programs are consistently found to shift college-bound students to colleges where they can use more scholarship dollars, increase enrollment at eligible colleges, and (for generous local programs only) increase community school district enrollment. Less consistently, programs boost college participation and thereby degree attainment, but evidence for direct effects on college performance, persistence or completion net of enrollment is weak. There is insufficient or inconsistent evidence for program effects on secondary school performance and graduation, post-college income and debt, community population or property values, and inequality reduction according to gender, race, or socioeconomic status.

Keywords: Financial aid, free college, promise program, college access, college completion

How Powerful are Promises?

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In the mid-2010s, "free college" in the United States seemed on the cusp of possibility. Several states launched tuition-guaranteeing "Promise" programs for community colleges[1], scores of similar programs were appearing yearly at public colleges elsewhere, President Obama proposed a nation-wide free community college program, a major presidential candidate (Bernie Sanders) advocated free public college, and some opinion showed majority support for free public college. This momentum evaporated with the 2016 election of Donald Trump and the COVID-19 pandemic.

Free college remains salient in the US for two reasons. First, there remains substantial public support for tuition-free college (Hartig, 2021). Second, at least sixteen state and over 200 local programs currently make college tuition-free (College Promise, 2021). Some claim that the era of free college has already arrived (Dickler, 2022; Farrington, 2022).

But free college is *not* here in the form most advocates prefer: (at least) a full tuition guarantee for most students attending any in-state public college (e.g., Kanter et al., 2021). Really existing free-college programs are often restricted to community colleges and limit eligibility by residence, age, prior college attendance, academic preparation,

[1] In the United States, public colleges which offer two-year (Associate) degrees, early coursework for transfer to four-year colleges, and shorter vocational credentials are called "community colleges". They are typically open-enrollment and considerably cheaper than four-year colleges.

income, and/or citizenship criteria. Aid is typically provided on a last-dollar basis[2], which, at community colleges, can mean little to no real price reduction for many students (Perna, 2016; Kelchen, 2017; Jones & Berger, 2018; Poutre & Voight, 2018).

Supporters claim free college improves performance and climate in secondary schools, boosts college attendance, performance, and degree completion, economically revitalizes targeted communities, and reduces disparities in educational attainment (e.g., Miller-Adams, 2015, 2021; Iriti et al., 2018; Miller-Adams & Iriti, 2022). However, existing free-college programs vary considerably, and supporters haven't specified whether benefits should be expected from any program or are predicated on certain design features (e.g., four-year applicability).

Below, I first review the recent history of free-tuition programs explain and how existing programs vary. After discussing limitations of prior reviews and summarizing review methods, I summarize evidence on mechanisms through which free college programs are theorized to impact various outcomes. Finally, I review the now-sizeable pool of rigorous evidence on how programs impact students, communities, colleges, and educational disparities. For each effect, I discuss the size and rigor of the evidentiary base, the consistency of findings, and whether effects differ by program features. What emerges is a nuanced picture of what free college programs can be expected to do, what they might do given certain design features, and what they are unlikely to ever do consistently.

[2] Last dollar or gap-funding programs cover tuition remaining after other grants and scholarships are applied.

A Recent History of Free College in the US

There have long been advocates of free public higher education in the United States, and several experiments in providing it during the second half of the 20th century (Miller-Adams, 2021). The contemporary "free college" political movement emerged around 2010, amidst the Great Recession and the Occupy Wall Street movement (Nelson, 2011). But programs in several states and a few score localities were already guaranteeing free tuition, resulting from of two distinct waves of policymaking unrelated to "free college" political projects.

The first was the proliferation of state merit scholarships in the 1990s and early 2000s. The policy model was Georgia's HOPE scholarship, which covered tuition at in-state public colleges (and could be applied to private college tuition) for direct-enrolling high school students with a 3.0 cumulative GPA. HOPE inspired similar programs in Florida, New Mexico, Louisiana, Indiana, Washington, Tennessee, Missouri, and beyond. Not all these fully covered four-year college tuition, and HOPE ceased to do so after 2012 (Lanford, 2017). These programs were often created by Republican elected officials or in Republican-leaning states.

The second was the College Promise movement, inspired by the 2005 launch of the Kalamazoo Promise. The Kalamazoo Promise guarantees full tuition at any public in-state college to graduates of Kalamazoo, Michigan's public schools[3] (Miller-Adams,

[3] Eligibility is restricted by length of attendance in Kalamazoo public schools. To be eligible for any scholarship (65% of tuition), a student must attend continuously from grades 9-12. To be eligible for a full scholarship, a student must attend beginning in kindergarten. For lengths in between, eligibility reduced 5% with each year.

2009). While not the first program of its kind (precursors existed in, e.g., Tangelo Park, Florida, Tamaqua, Pennsylvania, and Philomath, Oregon), the Kalamazoo Promise garnered national attention and inspired imitators, several of which also used the term "Promise". Its influence was built into a network (PromiseNet) and policy movement by the Kalamazoo-based Upjohn Institute (Miller-Adams, 2015).

Despite the retrospective reassessment of Miller-Adams (2021), Promise programs were not clearly oriented to a national "free college movement" until well after 2005 (see, for an exception, Bartik & Miller-Adams, 2009). Instead, they tended to be pitched, understood, and discussed as "place-based scholarships" intended to catalyze the revitalization of distressed municipalities (Miller-Adams, 2006, 2009, 2015). In these programs, scholarships were a tool to spur economic development by attracting families and building human capital. Despite the political preferences of some advocates, Promise programs were not generally discussed as "free college" initiatives until well after 2011. The economic development rationale explains Promise programs' strong support by many conservative politicians and business leaders prior to 2014.

As they proliferated, Promise programs diverged in design. The Kalamazoo Promise was replicated in its main features only once, in El Dorado, Arkansas. Most imitator programs scaled back Kalamazoo's generosity, applicability, and broad eligibility, a trend that intensified over time (Miller-Adams, 2015; Billings, 2018). Last-dollar funding became the rule almost immediately, programs were increasingly limited to community colleges (often a single community college), and eligibility was restricted by income and

academic criteria. While early Promise programs were mostly initiated by private sector actors or political leaders, colleges soon began launching their own programs.

In 2014, Tennessee created the first "statewide Promise program" - a last-dollar community college tuition guarantee. In the following years, several other states launched programs very similar to the Tennessee Promise. Local programs also appeared at a faster rate after 2014, mostly drawing on Tennessee's last-dollar community college model.

The convergence of the Promise policy movement with the emerging free college political movement largely began after 2014. Prior to that, Promise programs were a local affair with little partisan association. Indeed, the Tennessee Promise was proposed by a Republican governor, approved by a Republican legislature, and enjoyed the support of 86% of Tennessee residents (Vanderbilt University, 2014). Then, in 2015, the Obama administration proposed to create a nationwide version of Tennessee's program (America's College Promise). Subsequently, nearly all statewide Tennessee-type programs appeared in states controlled wholly by Democrats (Montana's is the major exception) while Republican states like Arkansas and Indiana turned to more limited "workforce development grants". The nonprofit created to advocate for nationwide free college, College Promise, was founded in 2015 by former Obama education undersecretary Martha Kanter. In polling, since 2016 at least, support for free college policies has split reliably along party lines (e.g., Hartig, 2021).

The relationship between the free college movement, largely populated by people with liberal or social-democratic politics, and existing free college programs is therefore not straightforward. State merit programs are largely ignored by free college advocates and Promise-focused scholars. Since 2018, Promise programs have been equated (as here) with "free college programs" and framed as expanding college access and affordability and thereby addressing educational and economic disparities. Earlier programs created on an economic development rationale have been retroactively drafted into the free college movement (e.g., Miller-Adams, 2021).

What are Free College Programs and How Do They Vary?

The history sketched above should make clear that what counts as a "free college" program is not simple. Indeed, "free college" is better conceptualized as a marketing term than a policy category. What gets called "free college" is more precisely a *full tuition guarantee* (or $0 tuition guarantee). In higher education, a *tuition guarantee* is a policy that assures a student that they will pay no more in tuition than a set amount. For example, the NC Promise limits tuition to $500 per semester for eligible students at specified colleges; it is a tuition guarantee, but not one of $0. So-called "free college" is a tuition guarantee where the guaranteed tuition is $0.

It should already be clear that not all "Promise" programs provide free tuition, let alone free college. For instance, the Buchanan Promise pays "up to $3,750 per year for four years", which is less than the in-district tuition at nearby public two-year Lake Michigan College ($5,265 in 2023-24). This program is not, and does not claim to be, a full tuition

guarantee. Other "Promise programs" that are not tuition guarantees include the Denver Scholarship Foundation Scholarship, Michigan City Promise Scholarship, the Moraine Park Promise, and the Oakland Promise. Even the Kalamazoo Promise is a full tuition guarantee only for students who attended Kalamazoo Public Schools for all K-12 years. Most Promise programs that guarantee full tuition only do so at community colleges.

Meanwhile, several (but not all) "state merit scholarships" *are* full tuition guarantees for eligible students—even at four-year public colleges. This includes the top level of Florida's Bright Futures scholarship (Florida Academic Scholarship), Indiana's 21st Century Scholars, and Washington's College Bound Scholarship. Statewide "Promise programs" typically guarantee full tuition at community colleges only, but others do so at four-year public colleges as well (e.g., Washington's College Grant and the New Mexico Opportunity Scholarship).

Indeed, the conceptual distinction between a Promise program and a state merit scholarship has always been fraught. Early on, commentators noted similarities but insisted that Promise programs had geographic eligibility restrictions to areas "smaller than a state" (Andrews, 2013:2; Miller-Adams, 2015:10). This was because, for commentators like Miller-Adams, essential to a Promise program was an economic development rationale. Never mind that proponents of state merit scholarships had argued that these programs would boost the state economy by stemming "brain drain" (Dynarski 2008). And never mind that there are counties and community college districts (both admissible geographic units for Miller-Adams) which exceed some states

in area and/or population. Very early on, some insisted that Promise programs had to entail "universal eligibility"—no income or merit distinctions (Miller-Adams 2011). But major early Promise programs, such as the Pittsburgh and New Haven Promises, had both. What logic remained to this distinction between Promise programs and state merit scholarships disappeared with the 2014 creation of the (statewide) Tennessee Promise, which exerted tremendous influence on subsequent local and state programs (Monaghan & Attewell, 2023). If Promise programs could (now) be statewide, and could have merit criteria, then why wouldn't state merit scholarships be included? This was tacitly recognized by Perna and Leigh (2018), who included state merit grants in their Promise database (Perna & Leigh, n.d.), as did College Promise (2021). Major analyses of "statewide Promise programs" by Research for Action (Callahan, et al. 2019), the Century Foundation (Mishory, 2018), and Education Trust (Jones & Berger, 2018) have included some state merit scholarships. At this point there is no sound analytical reason for not discussing these two program-sets together.

Therefore, my review will include as a "free college program" *any program, regardless of funding source or administering organization, that includes an explicit full tuition guarantee to a public college on an entitlement basis*. Programs discussed below are funded and/or administered by a combination of states, municipalities, foundations, colleges, and businesses. The provision of a dollar amount that will likely cover tuition at some eligible colleges is insufficient; they must ensure $0 tuition to eligible students. And they must cover any student who qualifies, rather than limiting to a set number of qualifiers or by available funds. Such characteristics ensure a consistent set of

mechanisms through which they may affect students, including those simplifying college pricing.

"Free college" programs nonetheless vary considerably; the typical axes of differentiation noted by scholars are *generosity* (what the program offers), *applicability* (where it can be used), *eligibility* (who can use it) (Miller-Adams, 2015; Iriti et al., 2018). These refer to differentiation in program design; Miller-Adams and Smith (2018) also note differentiation in program funding sources.

Each of these dimensions of variance is quite complicated. For example, *generosity* can and does include 1) the relationship of the scholarship with other grants (i.e., a first- or last-dollar mechanism), 2) what funds can cover (tuition only, tuition and fees, or more), 3) the presence of a maximum award, 4) the presence of a minimum award, 5) whether award is graded by some other factor (e.g., length of targeted school district attendance), 6) whether the award is an entitlement or if the number of recipients is limited, and 7) whether it guarantees the full coverage of some expense (usually tuition). Meanwhile, eligibility can be and is restricted by 1) geographic residence and/or school district attendance, 2) family income, 3) prior college experience (e.g., restriction to first-time students), 4) age/temporality (e.g., use within five years of high school completion), 5) citizenship status, 6) academic achievement (test scores, GPA, form of high school completion), 7) moral criteria (e.g., prior arrests or convictions), 8) enrollment intensity, and 9) various procedural criteria (e.g., early enrollment, applying to other scholarships, etc.). Moreover, there is no guarantee that these various elements of generosity, applicability, or eligibility co-vary; a program may be more generous or universal in

some regards and less in others. While detailed empirical study of program variance is needed, I do not provide it here.

For this review, I distinguish programs usable at four-year colleges from those restricted to community colleges. This is a proxy for a program's cost and per-student award amount, given the tuition difference between two- and four-year public colleges. I also distinguish "local" from "state" programs. Strictly speaking, this is a matter of funding and management. State programs are funded *and* managed by states; local programs are usually funded and/or managed by some entity "smaller than" a state, though this can include a state university. More important for the current analysis, state programs typically have statewide applicability (e.g., usable at *any* in-state college of a given type) and statewide geographic eligibility.

Prior reviews

Prior reviews of Promise/free college programs, while valuable, have been limited in crucial ways. Early reviews mostly introduced the category of "Promise program" to readers, as little empirical material was yet available (Andrews, 2014; Kelchen, 2017; Iriti et al., 2018). Reviews of statewide programs focus nearly entirely on program features rather than outcomes (e.g., Callahan et al., 2019; Jones & Berger, 2018; Perna and Leigh, 2018; Rosinger, 2021). Billings et al. (2021) discuss several statewide and local community college programs, but most of their evidence is descriptive, referencing only a handful of rigorous, quasi-experimental studies (covering Tulsa Achieves, the Oregon Promise, and Knox Achieves).

The three most comprehensive reviews to date are those of Miller-Adams and Smith (2018), Swanson et al. (2020), and Anderson (2021). Swanson et al. draws on research available in 2016 or earlier and restricts to "place-based" programs, excluding research on state programs. They review only sixteen studies, all but one of which cover unusually generous scholarships in Pittsburgh, Kalamazoo, El Dorado, Syracuse, Buffalo, and New Haven. The only community college program covered is Knox Achieves, the forerunner to the Tennessee Promise. Miller-Adams and Smith, who also exclude state programs, cover nearly the same set of studies as Swanson et al. Anderson cites 33 studies, but these too were mostly published by 2017 and cover the same six programs covered in the earlier reviews.

Existing reviews are not only limited but (statistically) biased. The well-studied programs are, as Miller-Adams and Smith (2018:4) write, "the more generous of the locally-based programs" providing at least a last-dollar tuition guarantee to a public four-year college. If generosity and four-year applicability increase the magnitude of program impacts, then reviews restricted to these programs will exaggerate general program effects. This bias derives from the choices of the research community. Indeed, few generous local scholarships have *not* been studied rigorously and intensively. In contrast, there are well over two hundred local community college programs in the United States, only a handful of which have attracted scholarly interest (See Table 1). It is true that the more generous programs were also among the first to appear, and that research takes time. But this does not fully explain the disparity in coverage, as scores of

local community college Promise programs were launched prior to 2010–easily long enough ago to allow for data-gathering, writing and publication.

(*Table 1 about here*)

Additionally, the Promise literature and the state merit scholarship literature have been nearly entirely segregated. Promise researchers discuss statewide programs like Tennessee *and* merit-restricted local programs like Pittsburgh, but studiously avoid discussing programs that are *both* statewide and merit-restricted. The inattention is mutual; even recent studies of statewide merit programs fail to cite research on local or state Promise programs (e.g., Goldhaber et al., 2020). Electing not to follow suit allows me to draw on a much larger set of studies. Still, however, the available literature disproportionately focuses on a small number of unrepresentative programs, and so, too, will my review. To compensate, I clearly distinguish effects by program type (state/local and four-year/community college).

Methods for Literature Review

I searched for all relevant scholarly research and commentary on Promise programs, free tuition/college programs, and state merit scholarships which have the possibility of fully covering tuition. I limited the search to peer-reviewed journals and books, publicly available working papers, policy reviews and commentaries by authors affiliated with educational think tanks and research organizations, and program evaluations; I did not include dissertations or journalism. I identified texts through several strategies. First, I searched Google Scholar using the following terms: "Promise program", "College

Promise", "free college", "free tuition", "free community college", "place-based program", "state merit scholarship", and specific program names (e.g., "Kalamazoo Promise", "Tennessee Promise", "Georgia HOPE"). Second, using identified sources, I engaged in "referential backtracking" (Alexander, 2020) and what could be called referential fore-tracking (since Google Scholar permits searching works that cite a publication). Eventually, working in this fashion, I reached saturation—that is, I was no longer encountering additional texts. Finally, I checked my assembled list against existing Promise literature databases maintained by the Upjohn Institute (2021) and College Promise (2020). I conducted the initial search in late 2022 but have updated subsequently.

My final list was 204 texts. From these, 88 studies involved quantitative estimates of program effects. I class studies as rigorous if they employ a quasi-experimental method: randomized trials, differences-in-differences (or triple differences), regression discontinuity, instrumental variables, or randomized control trial. I do not count regression with controls or matching as rigorous. Table 2 presents the full list of studies, along with the program they cover, research design, outcomes investigated, and groups for whom outcomes are separately calculated (for studying effects on disparities).

(*Table 2 about here*)

The Question of Mechanisms

Researchers have discussed free college programs as strongly influencing both student- and community-level outcomes. This theorization has been most elaborated for Promise programs, and it is on this literature that I draw principally. The most comprehensive discussions are in Miller-Adams (2015) and Miron and Evergreen (2008). Overall, researchers suggest six distinct mechanisms through which free-college programs may generate effects.

1) Programs supply *money* usable to attend college, changing educational behavior in a manner consistent with economic theory (Harris, 2021).

2) Programs alter the *information* according to which students' decision making occurs with relation to college. Scholars have referred to these as "messaging effects" (e.g. Harnisch & Lebioda, 2016).

3) Programs may induce *augmented organizational efforts* supporting targeted students, either at the postsecondary or K-12 levels, and both within schools and/or in the broader community (Iriti et al., 2018).

4) Programs may alter eligible students' *social and educational environments* in a manner that supports college-going (Miron et al., 2011).

5) Programs may alter *residential decisions*, either inducing relocation to the target area or dissuading moving from the target area. It is usually presumed that this will increase a) the population of the area and b) its composition, boosting the share of educated

and relatively prosperous members. These in turn will affect the community's standard of living (Miller-Adams, 2009).

6) In the longer run, programs *increase the human capital* of a targeted community, and thereby its prosperity, through increased educational attainment among residents (through mechanisms 1-4) (Miller-Adams, 2015).

In reviewing these mechanisms, I advance two arguments. First, not all Programs will plausibly activate all the above mechanisms, nor to the same degree, even in theory. Which mechanisms are operative, and with what strength, is depends on program features. Second, these mechanisms vary in the strength of their evidence base.

Monetary grants. Promise programs vary considerably in the amount of money they award to recipients. At the upper end are programs like the Kalamazoo Promise and the El Dorado Promise, which fully cover in-state public four-year college tuition on a first-dollar basis. Some other programs provide flat first-dollar awards which are sizeable (e.g, Arizona Assurance or the Arkadelphia Promise). For first-dollar awards, award size is reasonably straightforward. But most programs are last-dollar programs, which subtract other grant aid from the eligible expense and cover what remains. Such programs' monetary awards will vary considerably across students (and across programs). When the eligible expense is community college tuition (or even tuition and fees), the award amount will be comparatively small. It will be even smaller for low-income students because community college tuition is often less than a full Pell

grant. A lower-income community college student receiving a full- or near-full Pell grant will often have zero unpaid tuition and therefore receive no money from a tuition-only Promise program without a minimum award. In this case, mechanism #1 reduces to zero. This is a reality acknowledged, but rarely emphasized, by leading experts (Miller-Adams, 2015:45).

Given this reality, one would expect researchers to carefully collect and report dollar amounts received by students for the programs they study. But with few exceptions, such data is completely lacking from research on free-college programs. Perna et al. (2020) report what administrators of four local Promise programs told them (in interviews) about total costs. Spending on statewide programs is available and is discussed in Perna et al. 2017. But only one study to date reports administrative data on award sizes and number of recipients (Monaghan & Attewell, 2023). Considering this absence of data, it is astounding that the recently-released *Free College Handbook* tells readers that "evidence shows that larger grant amounts lead to greater student impacts on persistence and completion outcomes" (Miller-Adams & Iriti, 2022:12). It is impossible, with the present evidence base, to disentangle the direct effects of monetary awards, let alone their sizes, from other mechanisms (especially messaging).

Information/messaging. One of the most interesting emerging findings is that simply publicizing a free-college scholarship can, by itself, spur enrollment. This is because college price—that is, the dollar amount that a given student will be charged—is both frequently impossible to predict in advance and poorly understood by students and those advising them. The price mechanism in American higher education is exceedingly

complicated and ultimately idiosyncratic, for it is a function of listed prices, need- and merit-based grants, and "institutional aid". Listed prices vary drastically across colleges and change yearly. Federal grants are determined through a complex algorithm, and state grants vary by state and often have multiple and complex eligibility criteria (Levine, 2022). Finally, colleges—particularly private colleges—create highly individualized "aid packages" (in reality, they are setting individualized prices) for admitted students (Cheslock & Riggs, 2021). The baseline situation is thus that the price for student A to attend college C can be at best *estimated* in advance. Estimates can be made with more confidence at community colleges (where institutional aid is marginal) than at private four-year colleges. To complicate matters, people outside of higher education generally don't understand how college pricing works even in principle (Goldrick-Rab, 2016). Listed prices tend to be misunderstood as something close to what a student will have to pay, need-based grants are understood vaguely if at all, and loans are viewed with dread (Monaghan, 2023; Reavis, 2022). As a result, people have very vague estimates of college costs, little confidence in the estimates they make, and these estimates are on average too high (Bleemer & Zafar, 2018; Grodsky & Jones, 2007). Overestimation of college costs is more common and pronounced among lower-income individuals and when estimating the price of lower-cost schools (Bleemer & Zafar, 2018; De La Rosa, 2006).

Given this baseline, speaking of free-college programs as providing *information* is inaccurate. It isn't that people have too little or incorrect information and that programs provide additional facts or clarification. Programs *intervene to alter students'*

and families' conceptions of likely college costs (Monaghan, 2023). Neither the initial nor the new understanding need be "correct" (or incorrect). In fact, a free college program may simply render some of the complexity described above irrelevant. If a program is a guarantee (e.g., a tuition guarantee), it assures the student that they will not have to face the cost in question and so can disregard it. This may be sufficient to change a student's behavior independent of real cost reductions.

That messaging has direct effects is clearest where students are likely not receiving any money – low income "recipients" of last-dollar community college scholarships. Carruthers and Fox (2016) show that Knox Achieves had nearly identical effects on free-lunch eligible students as on ineligible students, despite the former likely receiving no aid from the program. Similarly, Anderson et al. (2023) find that the Milwaukee Area Technical College Promise had larger college attendance effects on lower-income students, despite these students almost certainly being unfunded. And Monaghan and Attewell (2023) document a last-dollar community college program boosting year-on-year enrollment by over 1,000 students despite funding only thirty. These results echo experimental results from the University of Michigan Ann Arbor showing that simply a guarantee of free tuition, absent additional aid, considerably increased application and enrollment rates (Dynarski, et al. 2018). In these cases, students are not responding to money, nor to price changes, nor even to price clarification. They are responding to *apparent price changes*, or to *price simplification*. Students may even *believe* that they are receiving program funds when they are not, thus responding to phantom awards (Monaghan, 2023). Some of this can

be traced to misleading program marketing emphasizing "free" to the exclusion of eligibility restrictions or funding rules (Callahan, et al. 2019; Hodara, et al. 2015); in some cases, this equivocation is intentional on the part of program administrators (Monaghan & Attewell, 2023; Kunkle, 2022).

"Messaging effects" may occur even in the presence of real transfers. Harris (2013) postulated that programs like Kalamazoo, by providing early assurance that college will be affordable, could lead students to invest more in school than they otherwise would have. In this case, the message is about real (future) cost reductions (see also Andrews, 2014). This precise pathway requires students to have reserve stocks of academic effort and to successfully turn this effort into effective performance. If true, we should see impacts of Kalamazoo-type programs on high school academic measures (reviewed below).

In sum, the relationship between an award and its communications, the "objective price situation" and a student's conception thereof, is more complex than is typically assumed. Free college programs may allow us to disentangle the effects of award dollars from the effects of cost-simplification (that is, if researchers measure award amounts). This could help establish whether tuition guarantees are more effective than equally generous flat awards.

Augmenting organizational action. That Promise programs may "catalyze systemic change" has been claimed prominently (e.g. Iriti et al., 2018). For instance, in the *Free College Handbook* we read that "While Promise programs do not offer an easy solution

to the challenge of providing effective student support, their introduction *often catalyzes new support efforts or better alignment of existing resources*" (emphasis added; Miller-Adams & Iriti, 2021:15). The idea is that the announcement of a Promise program will inspire *other actors* (local government, business leaders, foundations, etc.) to create or change organizational practices in a manner that supports the program's goals. Such changes are typically alleged to occur at the community level, supporting K-12 students, but it applies to supports for students after college enrollment as well (created by colleges or other organizations).

In the case of community-level action, this mechanism is most plausible for Kalamazoo-style programs: simple, generous, tightly geographically targeted. This is because the causal connection is essentially emotional or moral: the new program generates enthusiasm and renewed hope, inspiring local elites to get involved. Such community enthusiasm has been documented in the cases of generous place-based programs like Kalamazoo (Miller-Adams, 2009) and Say Yes to Education - Syracuse[4] (Osher et al., 2015) but would likely be muted in the case of less generous or diluted in the case of less-targeted programs, respectively. In the case of additional support programs created by colleges for their own free-college programs, other forces would be at play.

There are three additional problems with this hypothesized mechanism beyond limited applicability. The first is operationalization; researchers have been imprecise when formulating this hypothesis. Iriti and co-authors (2018) write that the launch of a free-

[4] Say Yes to Education is a nonprofit philanthropy that predates the Kalamazoo Promise but which, after 2005, created partial imitator programs in Syracuse, Buffalo, Cleveland, and Guildford County, North Carolina.

college program produces "coordinated and focused efforts across sectors" as well as "within-sector reforms". This phrasing could encompass both minor shifts in practices (e.g., rebranding existing services) as well as sizeable organizational efforts. In some cases, "additional services" can involve as little as reassigning a small number of staff members away from existing programs (Monaghan & Attewell, 2023; Perna et al., 2020, 2021).

Second, we know very little about the substance, prevalence, or endurance of such changes. Evidence is scattered and anecdotal. The initial source for this claim is Miller-Adams' case study (2009). After the Kalamazoo Promise was announced,

> Parents volunteered in the schools, some for the first time. Churches introduced mentoring programs. New opportunities were created for students to recover credits and graduate on time. The local community college and university strengthened their services for first-generation college attendees. Businesses developed programs to support the economic goals of the Kalamazoo Promise. Yet even three years later, these efforts remained diffuse and uncoordinated. (104)

Beyond this list, Miller-Adams provides little detail or documentation. Iriti and coauthors (2018) list examples of program-inspired changes in El Dorado, Pittsburgh, Kalamazoo, and Lynchburg, Virginia (home of Beacon of Hope). Osher et al. (2015) find that the Syracuse school district collaborated actively with aspects that city's Say Yes to Education program that were directly relevant to easing the postsecondary transition,

which it already had as a goal, but was less responsive to initiatives that seemed irrelevant to this end (e.g., afterschool supplements) and resisted attempts by the Say Yes organization to impose program reviews. The *Free College Handbook* offers examples of five local and one statewide program offering some in-house support service (pp. 16-17). This is the extent of support for this claim.

Systematic data on this question is lacking, but available evidence suggests that additional support services are rare. Burkander et al (2019:16) report that "most statewide Promise programs provide few if any student supports". I examined the websites of 314 existing local programs and found that 244 (77%) report no additional voluntary services to students (data available from author upon request). The commonest services offered were additional (or designated) advising (31 programs), priority registration (28 programs), and coaching or mentoring (27 programs). Moreover, when additional programs are created through a rush of enthusiasm, it is likely that many of them are abandoned once the excitement wears off.

Third, this mechanism presumes that additional organizational actions are effective. The effects of common support services, such as tutoring or coaching, are not well-established empirically (Monaghan et al., 2018; Weiss et al., 2022). Effectiveness must be multiplied by uptake rate to determine overall impact. Moreover, if services are made mandatory to improve uptake, this may counteract positive effects by disqualifying students who don't partake. The positive impact on takers, as well as the uptake rate, must be large enough to compensate for this disqualifying effect for the

mandatory service to have a net positive impact. Indeed, *mandatory services* are better conceptualized as *procedural eligibility restrictions*–the scholarship is limited to those who accomplish a given procedure, including (say) attending tutoring services.

Just as with monetary awards, readers should understand the above as an incitement to collect data and measure effects instead of making unsupported assertions. At present the evidence base does not support claiming this mechanism to be operative.

Improving social environments. Researchers and advocates claim that Promise programs impact students through creating or intensifying a "college-going culture" in their school and/or community. By this, what is typically meant are positive peer effects and positive teacher/staff interactions. For peer effects, the logic is that a program will cause more students to believe that college is possible for them (the cognitive/messaging effect discussed above), leading them to commit more intensely to academics. If such effects are widespread, peer environments will better support academic success, producing effects for individuals over and above direct effects (i.e., mechanisms 1 and 2). Similarly, the program is theorized as changing teachers' perceptions of students, seeing them now as "college-bound", and thereby changing their behavior towards students, perhaps encouraging a positive academic identity or even increasing curricular rigor. Other social environment effects involving families or community members would work similarly. School and community environments could additionally be impacted through shifting residential decisions of college-bound children and their parents (see below), though these effects would have to be large to make a measurable difference.

While reasonable, this logic suffers two problems. First, as with organizational mobilization, this mechanism is most plausible for tightly geographically bound and generous (Kalamazoo-type) programs. For less geographically targeted programs, communication networks are likely insufficiently dense to shift interactional environments. For less generous programs (e.g., community college awards), the behavioral effects are likely too small to generate peer effects.

Second, the empirical basis for these claims occurring with free-college programs is extremely sparse. It derives mostly from two papers from early in the Kalamazoo Promise (Miron et al., 2011; Jones et al., 2012). The measurement and conceptualization problems with both papers cast strong doubt on the validity of their findings. The studies purport to examine program impacts on "school climate" (Miron et al., 2011) and teachers' "beliefs, expectations, and behaviors" Jones et al., 2012), but draw on data collected solely *after* the program launch. Accordingly, they do not measure *changes* in anything. "Change" is discussed in interviews conducted after the launch and given to researchers investigating program impacts; thus, priming effects are likely.

Additional indirect support for this mechanism is provided by a quasi-experimental study finding positive effects of Promise programs on college expectations (Odle, 2022), and by findings that the Kalamazoo Promise reduced days students were suspended from school (Bartik and Lachowska, 2014). But college expectations need not translate into behavioral shifts, behavioral shifts must be widespread and large to shift environments, and environmental impacts on academic outcomes are neither large nor reliably found in prior research.

To be clear: that the launch of a hugely generous tuition guarantee in a poor district could change perceptions and behaviors in the district is quite plausible. We simply lack sufficient credible *evidence* to support this claim.

Changing residential decisions. Promise programs are frequently asserted to improve communities. The scholarship pledge is hypothesized to induce some families to relocate to the eligible geographic area, and others to remain in the area rather than relocating elsewhere—particularly families who believe their children to be college-bound. Aggregated, family-level effects are expected to increase enrollment in the target school district, population in the targeted geographic area, and shares of households with higher-earning and educated adults. In turn, such shifts are expected to induce faster economic growth and its correlates (higher tax revenues, improved public services, lower unemployment, reduced crime, etc.), inducing a virtuous cycle.

This mechanism should generate visible impacts, at least on population measures, in relatively short time frames. I review the causal evidence for this claim (there have been several rigorous studies) below. At this point, the main point to make is that, even more so than the organizational infrastructure or school environments mechanisms, this mechanism is plausible only for generous, bounded, Kalamazoo-type programs. It is unlikely many families would relocate to, or remain in, a troubled school district to qualify for free community college. The authors of the *Free College Handbook* seem to agree, writing that "evidence (for this effect) comes from a handful of studies of relatively generous Promise programs and may not be applicable to the Promise movement overall." (P. 30).

Increasing community educational attainment. Finally, Promise programs are expected to increase the human capital of an eligible community's population; as with relocation-based population changes, this should boost economic development. Similarly, statewide merit grants have been pitched by policymakers as both boosting college attainment and dissuading college-bound youth from leaving the state (i.e., brain-drain), stimulating faster growth. I review the research evidence for these claims below. At present, there are two points to make. First, even a successful program will change the composition of the workforce slowly, so effects would accumulate over longer time frames, rendering identification a challenge. Second, attainment effects may be offset by increased mobility. Since education increases propensity to migrate (Bernard & Bell, 2018), communities of origin are unlikely to fully enjoy the program's impacts on attainment. As the likelihood of out-migration is inversely proportional to the size of the catchment, tightly bounded scholarships may face more such attrition than statewide programs.

To review: of the six mechanisms through which Promise/free college programs may impact students or communities, three–improving social environments, inspiring organizational efforts, and influencing residential decisions–are implausible for programs which are not both tightly geographically bounded and strikingly generous *a la* Kalamazoo. And there are but a handful of such programs among the hundreds of existing "free college" endeavors. The evidence base for three mechanisms—organizational efforts, social environments, and (amazingly) the size and extent of monetary awards—is exceedingly thin. At present we only have evidence to evaluate

claims that programs affect outcomes through messaging and through residential decisions (evidence for the latter discussed below). Researchers wishing to make further claims must, in the future, carefully and systematically gather empirical evidence sufficient to permit their assessment.

What do Promise programs accomplish?

Free college/Promise programs are expected to have strong effects on eligible students and targeted communities. They also, though this is less often discussed, may impact the colleges at which they may be used. I now assess the collected empirical evidence supporting such claims.

Students are programs' immediate intervention targets, so student-level effects should be most clear and measurable. Some effects are expected across all types of programs. To the extent that they lower the real or apparent cost of college, programs should *increase college enrollment*. Because the financial strain of paying for college may undermine college outcomes, they are expected to *improve college academic performance and increase both retention and degree completion*. They may *increase wages* by increasing students' human capital. And since program funds displace loans, they are expected to *reduce borrowing and debt*.

Other program effects may depend on design. Programs may have positive impacts on *high school academic performance* by giving students incentive to improve grades and skills in anticipation of applying to college. Such effects may be larger for four-year applicable scholarships, as community colleges accept students regardless of prior

performance. Programs effects on high school achievement through improved high school climates are, as argued above, more plausible when programs are generous and locally targeted.

High school performance and completion. Promise-style programs' effects on high school outcomes are moderately well-studied, but effects are highly inconsistent. Program effects are measured in seventeen studies, of which eleven are rigorous. Ten studies focus on four-year applicable local programs, five on four-year applicable state programs, and one each on a community college state program and local program.

Eight studies examined effects on grades and credits; four find evidence of small positive impacts. Bartik & Lachowska (2014) estimate that the Kalamazoo Promise produced small, nonsignificant increases in GPA and credits earned among all students, and slightly larger and more reliably significant positive effects for African American students. Gonzalez et al. (2014), studying the New Haven Promise, found small increases in the probability of meeting *both* academic requirements for the program (a 3.0 GPA and 90% attendance), but effects on either outcome individually were nonsignificant. Monaghan & Coca (2023), studying the Milwaukee Area Technical College Promise, found significant but very small increases in twelfth-grade GPA. There is descriptive evidence that Georgia HOPE improved high school GPA (Henry & Rubinstein 2002). Nonsignificant or negative effects on grades or credits were measured for the Pittsburgh Promise (Gonzalez et al., 2011), Milwaukee's Degree Project (Harris et

al., 2020), and Washington's College Bound program (Fumia et al., 2018; Goldhaber et al., 2020).

Other high school outcomes are less well-studied. An increase in math test scores (11% of a standard deviation) was observed for the El Dorado Promise using matching (Ash et al., 2021; see also Ritter & Swanson, 2020), with larger effects for students with higher prior academic achievement. Gonzalez et al. (2014) find no increase in state test scores overall caused by the New Haven Promise. Descriptive evidence of positive test score effects has been found for Kalamazoo (Bartik et al., 2010), Georgia HOPE (Henry & Rubenstein, 2002), and Florida's Bright Futures (Harkreader et al., 2008). Five studies examine program effects on high school completion. A study of Knox Achieves found a 3-4 percentage point increase in graduation likelihood (Carruthers & Fox, 2016). Inconsistent or nonsignificant effects were found for Say Yes Syracuse (Bifulco et al., 2017), Say Yes Buffalo (Bifulco et al., 2019), the Degree Project (Harris et al., 2020), and Washington College Bound (Goldhaber et al., 2020). Three studies find null or negative impacts on attendance (Monaghan & Coca, 2023; Gonzalez et al., 2011; Harris, 2020). Two find positive impacts on college aspirations (Odle, 2022; St. John et al., 2004), and one (of the Kalamazoo Promise) finds a negative impact on days suspended from school (i.e., a positive outcome) (Bartik & Lachowska, 2014).

Overall, the research evidence does not allow for the conclusion that Promise-style or free college programs strongly or consistently improve high school outcomes. Most of the evidence comes from programs that fully fund four-year college attendance, and some of these programs (New Haven, Pittsburgh, the Degree Project) have merit

requirements for eligibility. Despite this, the bulk of the evidence suggests at best small, inconsistent impacts on high school behaviors and performance.

Effects on college enrollment and destination. College enrollment and destination are the best studied and most theoretically obvious outcomes for Promise-type programs. There are thirty studies of such effects, and all but four use rigorous design.

Twelve studies provide college participation estimates for four-year applicable local programs. Studies of El Dorado, Kalamazoo, and Say Yes Buffalo find consistent and positive effects ranging from five to fourteen percentage points (Bifulco et al., 2019; Ritter & Swanson, 2020; Bartik et al., 2021; Swanson & Ritter, 2020). Evidence is mixed on the Pittsburgh Promise, but studies that include the years of full implementation suggest positive effects (Page et al., 2019; Page & Iriti, 2016; for null effects see Gonzalez, 2011; Bozick et al., 2015). Studies of the New Haven Promise and the Degree Project find no evidence of an increase in college-going (Gonzalez, 2014; Daugherty et al., 2016; Harris et al., 2020; Harris & Mills, 2021).

Nine studies focus on four-year applicable state programs. Georgia HOPE was estimated to increase college-going by eight percentage points (Dynarski, 2000). For Florida's Bright Futures, Casteman et. al (2014) estimate a 5-8 percentage point increase for qualifiers of the program's 100% tuition guarantee but find null effects for those receiving its 75% scholarship, while Gurantz and Odle (2022) find no impact of the program. One study of Massachusetts' Adams scholarship estimated a 2 percentage point increase (Cohodes & Goodman, 2014), while another found a null impact

(Goodman, 2008). Two studies estimate null effects for Washington's early-commitment College Bound program (Fumia et al., 2018; Long et al., 2021). There are positive descriptive findings for Bright Futures and Indiana's 21st Century Scholars program (Harkreader, 2008; St. John et al., 2004). Studies of community college programs have found positive increases in college participation of between 1.5 and 4 percentage points (Munoz et al., 2016; Anderson et al., 2023; Carruthers & Fox, 2016; Gurantz, 2020; Pluhta & Penny, 2013; Hodara & Childress, 2021), except for a null effect in the first year of the Oregon Promise (Gurantz 2020).

College destination effects can be summarized succinctly: programs shift students to applicable colleges and away from non-applicable colleges. The slight nuance here is that programs applicable at *both* two- and four-year public colleges shift students from the former to the latter. Four-year applicable programs estimated to shift students from two- to four-year colleges include the Pittsburgh Promise (Bozick et al., 2015; Page & Iriti, 2016; Page et al., 2019; but see Gonzalez, 2011), Say Yes Syracuse (Bifulco et al., 2019), Kalamazoo (Bartik et al., 2021; Andrews, 2010), and Georgia HOPE (Dynarski, 2000). Programs for which estimates are null or mixed include the New Haven Promise (Daugherty et al., 2016), the Degree Project (Harris, 2020), Florida's Bright Futures (Castleman et al., 2014; Zhang et al., 2016; Gurantz & Odle, 2022), and Washington College Bound (Fumia et al., 2018; Long et al., 2021). Community college programs, on the other hand, divert students from four- to two-year colleges (Carruthers & Fox, 2016; Anderson et al., 2023; Munoz et al., 2016; Gurantz, 2020). Programs restricted to in-state public colleges tend to divert students to these schools and away from out-of-state and

private colleges (Andrews, 2010; Gonzalez et al., 2011; Page & Iriti, 2016; Daugherty et al., 2016; Bifulco et al., 2019; Page et al., 2019; Bartik et al., 2021; Dynarski, 2000; Goodman, 2008; Cohodes & Goodman, 2014; Zhang, et al. 2016; Long et al., 2021; Gurantz & Odle, 2022).

Taken as a whole, there is moderately consistent evidence that Promise-style programs increase college participation. There is very strong and consistent evidence that programs shift college-bound students to colleges where they can use more scholarship dollars. This means that four-year applicable programs shift students from community colleges to four-year schools (even if the scholarship can be used at a community college), while community college programs do the opposite.

College performance and completion. The effect of Promise-style programs on college performance, persistence, and degree completion is well-studied: 29 studies, 24 of which are rigorous. However, findings are not consistent.

The most consistent findings are for some four-year applicable local programs. Both the El Dorado and Kalamazoo Promise programs increased bachelor's degree attainment, and overall degree attainment, by between 6 and 11 percentage points (Bartik et al., 2021; Swanson & Ritter, 2021; Ritter & Swanson, 2020). The Pittsburgh Promise increased the share of high school completers still enrolled after two years (Page & Iriti, 2016; Page et al., 2019), but degree completion effects haven't been estimated for this program. The Degree Project increased two-year degree completion

by less than one percentage point (Harris & Mills, 2021), but didn't impact overall or four-year completion.

State four-year programs have inconsistent effects. The effects of Georgia HOPE and Florida's Bright Futures programs on degree completion are unclear, with some studies finding positive effects (Rubenstein, 2003; Henry et al., 2004; Castleman, 2014) and others null effects (Sjolquist & Winters, 2013, 2015a). HOPE's GPA requirement to retain the scholarship appears to have induced some students to take and complete fewer courses (Cornwell et al., 2005). The retrenchment of HOPE due to budget shortfalls in 2011 didn't seem to impact retention or degree completion (Jones et al., 2020). Washington's College Bound scholarship doesn't appear to have increased completion (Fumia et al., 2018; Long et al., 2021), and Massachusetts' Adams scholarship reduced completion by encouraging students to attend less-selective colleges (Cohodes & Goodman, 2014).

Fewer studies investigate the impacts of community college programs. Knox Achieves increased the completion of postsecondary credentials and associate degrees but decreased bachelor's degree completion (Carruthers & Fox, 2016). This is consistent with findings regarding college destinations summarized above. Hodara and Childress (2021) estimate that qualification for the Oregon Promise boosted college GPA. Bell (2020) and Bell and Gandara (2021) investigate the effects of qualification for Tulsa Achieves *after enrollment* (they use college administrative data). Compared to non-qualifiers at Tulsa Community College, recipients were more likely to complete a degree within three years, to transfer to a four-year college, and to complete a bachelor's

degree. However, they didn't earn higher GPAs, accumulate more credits, or remain enrolled for more semesters (Bell, 2020). And given that their data doesn't permit the authors to estimate diversion effects of the scholarship before enrollment, findings regarding bachelor's completion are questionable.

Overall, there is little evidence that Promise-style programs boost the academic performance of recipients once they are in college. In most studies enrollment effects are much larger than persistence or degree completion effects, suggesting that Promise-style programs increase completion through getting more students into college rather than by increasing retention rates among those who enroll. For instance, Bilfulco et al. (2019) estimate an 8-10pp increase in initial college enrollment, and a 5-9pp increase in enrollment at two years; clearly the persistence increase was driven by the enrollment effect. Bell's Tulsa Achieves study presents some of the only evidence we have that Promise-style programs positively impact academic progress net of enrollment, but even here null findings for GPA, credit accumulation, and retention are telling.

Post-college effects on students. We know, to date, very little about how Promise programs might affect students beyond college. Only four studies report such effects (all rigorous). Hershbein (2021) uses linked state wage data to study the impact of the Kalamazoo Promise on earnings. He finds mostly null effects, but suggestions of slight positive impacts near the middle of the wage distribution. Comparatively, Carruthers et al. (2020) find that Knox Achieves did boost wages (by about $1000) seven years after high school. Borg et al. (2021) examine the impact of Florida's Bright Futures program

on student loan debt. Overall, the program appears to have slightly increased debt levels (perhaps by inducing longer enrollment), but there are suggestions that for lower-income students the effect may be to reduce debt. Finally, Odle et al. (2021) find that the Tennessee Promise reduced the share of students taking on debt by 10 percentage points and reduced the average loan by about $300.

Effects on schools and communities. Sixteen studies examine program effects on communities or schools, thirteen of which are rigorous. Eleven studies examine four-year applicable local programs, three examine four-year applicable state programs, and two examine local community college programs.

The strongest evidence for community impacts is on enrollment in targeted school districts. This is descriptive evidence, but it is very clear. The Kalamazoo Promise seems to have induced a dramatic increase in district population in the program's first year, resulting both from a jump in new entrants and a decline in district exits (Bartik et al., 2010). This is particularly striking because it reversed decades of district population decline. Over the next few years, district enrollment continued to increase slightly and then stabilized. By 2009 (four years after launch), the district population had increased by roughly 2,400 students, or 25%, over projected (declining) population. Because Michigan funds districts in part based on enrollment, this resulted in roughly $6 million in additional school funding to the district. There is additional evidence that the program brought more academically prepared, and less economically disadvantaged, students to the district, though this effect is small (Hershbein, 2013). This, too, is in keeping with the economic development strategy. It doesn't seem that enrollment

gains were concentrated at higher-performing schools (Hershbein, 2013; Miller, 2018). A proportionally large increase in enrollment also followed the launch of the El Dorado Promise. This program boosted district enrollment over projected trends (also declining) by roughly 600 students, or by 15% (Ritter & Swanson, 2020).

Enrollment effects elsewhere have been more muted. The Say Yes programs in Syracuse and Buffalo seem to have increased school enrollments by between 3% and 8%, and in these cases enrollment gains were concentrated at previously higher-performing schools (Bifulco et al., 2017; Sohn et al., 2017). Similarly, in a study of twenty-two four-year applicable place-based programs, LeGower and Walsh (2017) found an average enrollment increase of 4%, with larger effects for less restrictive programs and smaller effects for merit-based programs. Billings' (2020) study of Michigan Promise Zones (which mostly offer community college scholarships) identified small (less than 2%) and inconsistently statistically significant impacts on out-migration; in-migration effects were positive but less than 1%. There was no clear increase in enrollment caused by the Pittsburgh Promise (Gonzalez et al., 2011).

Evidence of community development effects beyond school district population increases is slight. Bartik and Sotherland (2015), studying eight generous local programs, found slightly reduced out-migration for the first three years after program launch, but no effect on in-migration. Overall "migration area" population (which includes areas beyond scholarship eligibility boundaries) increased by 2.7%, with larger increases among households with children. Leigh and Gonzalez-Canche (2021) find no impacts of the Say Yes programs in Buffalo and Syracuse, or of the Lacrosse Promise, on

target area population. LeGower and Walsh (2017), studying twenty-two local programs, find increases in home values of between 4-12%, depending on specification, with higher increases in prices in more expensive areas and in areas with "quality" elementary schools. Conversely, there was no evidence found of program effects on home prices in Kalamazoo (Miller, 2018) or in Bartik and Sotherland's (2015) study of eight generous programs.

Residence-restricted tuition guarantees could boost the share of the area's population with postsecondary training, and thereby (in theory) earning higher wages. This is the second, less-direct means through which these programs are hoped to increase an area's "human capital" and therefore its economic growth. Most studies of this matter are of four-year applicable state scholarships. Dynarski (2008), in a study Georgia HOPE and a similar program in Arkansas, found that these scholarships boosted the share of young workers with a college degree by 3 percentage points (but see Sjoquist & Winters, 2012). Hickman (2009) finds that cohorts eligible for Florida's Bright Futures scholarship were 4 percentage points more likely to settle in-state, and that this was solely found among bachelor's holders. Conversely, Sjoquist and Winters (2013) found that HOPE increased the probability of a student going to college in-state, but reduced the share of graduates who settle in-state. Hershbein (2013) found positive impacts of the Kalamazoo Promise on the probability of residing in the Kalamazoo area four to six years after high school graduation. Finally, a study of local community college programs found null or negative program effects on the share of residents with at least some college education (Ruiz et al., 2020).

Effects on colleges

Less commented on in the Promise literature is that the launch of a Promise program can impact the colleges where it could be used. We would expect such effects to be minimal in the case of broadly applicable local programs, since these programs cover relatively few students and disperse them across many colleges. We would expect them to appear in the case of statewide programs and of local programs applicable to single (or a few) colleges. Effects on colleges are the subject of nineteen studies, all but two of which use rigorous causal design. Twelve of these are studies of state-level programs.

The most consistent effect of programs in this regard - and indeed, one of the most consistent effects overall - is on enrollment at eligible colleges. This is the college-level manifestation of the consistent tendency of programs to shift college-going to eligible colleges, and their less-consistent tendency to boost aggregate college participation. Studies of statewide four-year programs - Georgia HOPE, Florida Bright Futures, and Massachusetts' Adams scholarship - show consistent enrollment increases at in-state public colleges (Cornwell et al., 2006; Singell et al., 2006; Zhang et al., 2011; Cohodes & Goodman, 2014). HOPE also increased enrollment at in-state private colleges; the scholarship could be used there as well but covered a smaller share of tuition (Cornwell et al., 2006). Positive enrollment effects were estimated at between 6% and 42%, depending on the program and sector. The only countervailing result in this regard is a null finding for enrollment effects of New York's Excelsior Scholarship (Nguyen, 2019). That state community college programs boost enrollment at applicable schools has been found mostly in studies of the Tennessee Promise (Nguyen, 2020; House &

Dell, 2020; Bell, 2021; Lee et al., 2022) and of its adult extension, Tennessee Reconnect (Collum, 2022). The estimated effects of the Tennessee Promise on community college enrollment range up to 40% (Nguyen, 2020). Michigan's Promise Zones, which mostly create local community college scholarships, boosted enrollments at eligible schools by an average of 2-5 percentage points (Billings, 2020). Using a national sample of 33 local community college programs, Li and Gandara (2020; Gandara and Li, 2020) estimate enrollment increases of 22%; they estimate that 9-16% represents increases in new enrollment (relative to less proximate colleges). Monaghan and Attewell (2023), using descriptive methods, find that the introduction of a single-institution community college program doubled first-year enrollment at the applicable college. Conversely, using a national sample of local four-year and community college programs, matched to applicable and geographically proximate colleges, Delaney and Hemingway (2020) estimate null to negative enrollment effects.

Other college-level effects are less consistent and less well-studied. Studies of Georgia HOPE and of Florida's Bright Futures Scholarship find that the programs boosted degree production at applicable colleges by 1-7%, and STEM degree production by 5-10% (Zhang, 2011; Zhang et al., 2013). Studies do not show consistently that colleges take advantage of statewide programs to increase tuition. In the case of Georgia HOPE, public colleges increased tuition more slowly than comparison colleges but increased room and board more rapidly. Private colleges eligible for HOPE funds raised tuition more rapidly, but not room and board (Long, 2004). Bell (2021) estimates that in-state community colleges raised tuition in response to the Tennessee Promise, but lowered

fees in relative terms. Inconsistent effects of local programs on college tuition are found in Delaney and Hemenway (2020). Studies of the Tennessee Promise also suggest that the program caused declines in per-student spending on instruction, student services and academic supports (Odle & Monday, 2021; Lee et al., 2022). These findings are not reflected in studies of the Oregon Promise (Lee et al., 2022) or of local programs (Delaney and Hemenway, 2023).

Do Promise programs lessen inequality? Eight studies examine differential effects by gender. Most of them find that programs compound pre-existing disparities. Studies find larger college enrollment and academic achievement effects on females than on males for the Kalamazoo Promise (Bartik et al., 2016), Georgia HOPE (Dynarski, 2000), Florida's Bright Futures (Zhang et al., 2011, 2013) and larger effects on earnings for males of Knox Achieves (Carruthers et al., 2020). Conversely, Henry and Rubenstein (2002) document larger academic performance increases (in high school) due to Georgia HOPE for males. Hershbein (2013) finds no difference in wage effects of the Kalamazoo Promise by gender. Effects on STEM production have been found to favor women (reducing disparity) for Florida's Bright Futures (Zhang et al., 2011) and men (aggravating disparity) for Georgia HOPE (Sjolquist & Winters, 2015b).

Fifteen studies estimate differences in program effects by race. Six find that programs narrow racial disparities, four find that they expand disparities, and the rest find no significant differences. The Kalamazoo Promise had larger college enrollment and completion effects on Black than on White students (Bartik et al., 2016) but larger earnings effects on Whites (Hershbein, 2013). Odle (2022) estimated that local four-year

Promise programs nationally increased the college aspirations of minoritized students more than White students, and of lower-income minoritized students most of all. The Pittsburgh Promise did not have racially differential effects on high school performance or college access (Gonzalez, 2011). Studies of Georgia HOPE are mixed in terms of whether they increase White or non-White enrollment more (Dynarski, 2000; Cornwell, 2006), and Florida Bright Futures did not have differential effects (Zhang et al., 2013; Gurantz & Odle, 2022). Bell & Gandara (2021) find that Tulsa Achieves had larger degree completion and vertical transfer effects on Black and Latinx students than on Whites.

Twelve studies reported differences in program effects by socioeconomic status - seven for four-year local programs, three for four-year state programs, and two for local community college programs. Three studies find larger effects on key outcomes for lower-income students (closing disparities), four find larger effects for higher-income students (exacerbating disparities), and six find no substantial differences in effects by family income. Generous local programs appear to boost college aspirations disproportionately among lower-income students (Odle, 2022), and the Kalamazoo Promise increased the likelihood of sending scores to state universities, but not the local community college, more for lower-income students (Andrews et al., 2010). However, college enrollment effects didn't differ by family income for the Pittsburgh Promise (Gonzalez et al., 2011; Page & Iriti, 2016), and Say Yes Buffalo produced larger effects for students from low- and mid-poverty schools than for those from high-poverty schools (Bifulco et al., 2019). For Georgia HOPE, there are findings suggesting

larger effects for higher-income students (Dynarski, 2000) and for lower-income students (Singell et al., 2006); for Florida Bright Futures, differences by income are small and nonsignificant (Gurantz & Odle, 2022). The Kalamazoo Promise seems to have generated larger gains in college completion for higher-income students (Bartik et al. 2016), though this didn't translate into larger income gains (Hershbein, 2021). Tennessee Promise forerunner Knox Achieves increased high school completion and overall initial college enrollment more sharply for free-lunch eligible than for ineligible students. It also produced a negative effect on four-year enrollment (recall that this is a community college scholarship) only for higher-income students. Over a longer time frame, though, the effect produced a slight increase in associate degree attainment only for non-FRL students and no measurable changes in earnings for any income group (Carruthers et al., 2022).

Finally, a few studies differentiate program effects by prior academic achievement, and findings are inconsistent. Studies of the El Dorado Promise reveal larger gains in college enrollment among lower-GPA students, but higher gains among higher-GPA students in math achievement scores and in bachelor's completion (Ash et al., 2021; Swanson & Ritter, 2021). The studies of Georgia HOPE and MA Adams which identified unintended negative program consequences (increasing course withdrawal and reducing bachelor's completion, respectively) find that such effects are localized among lower-performing students (relatively, since both are merit scholarships). Studies of Knox Achieves show larger initial enrollment gains among lower-achieving students, but increases in associate degree attainment only among higher-performers (Caruthers &

Fox, 2016; Carruthers et al., 2022). Bell and Gandara (2021) find that Tulsa Achieves produced larger increases in bachelor's completion among high-GPA minoritized students than among lower-GPA minoritized students, though estimates were positive for both groups. The contrasting finding is that Washington's College Bound scholarship had larger effects on college-going among lower-GPA students (again, relatively, since this is a merit scholarship).

Overall, the evidence does not suggest that free college-style tuition guarantee programs consistently reduce pre-existing disparities. Whether one looks at studies that examine differing program effects by gender, race, or class, a minority of studies in each case show clear disparity-reduction effects. Such studies are matched nearly one-to-one by studies showing the opposite, and the plurality of studies find no effects in this regard. On the other hand, the bulk of the evidence finds that programs produce stronger positive impacts on more academically prepared students. We are looking at program impacts among *recipients*, of course. When programs target eligibility to disadvantaged populations, their total effects may still be to reduce disparities (by race, class and academic achievement, not gender). Whether this is so is, however, an empirical matter not presently addressed by the literature.

Summarizing findings. To make the results of this review clear, though possibly overly simplified, I draw together results by outcome in Table 3. Admittedly somewhat arbitrarily I am calling an outcome "well-studied" if it is the subject of at least five rigorous studies, and I am classing the consistency of findings as "inconclusive" if fewer than half show expected results, as "moderate" if between half and two-thirds show

expected results, and "consistent" if two-thirds or greater show expected results. By "expected results", I mean results that align with theory (usually positive and statistically significant). For studies with mixed findings, I class them as showing "expected" results as long as one major finding was in the expected direction. That is, this summary allows draws to count as wins for free-college programs.

(*Table 3 about here*)

On the strength of existing research and my criteria, there are only three well-studied outcomes with consistent positive findings: school district enrollment, postsecondary destination, and enrollment at eligible colleges. Results for school district enrollment are restricted to four-year applicable programs with tight geographic eligibility requirements. Postsecondary destination effects depend on program design but are easy to summarize: programs shift students to colleges where they can use more scholarship dollars. College enrollment effects are a corollary of destination effects, but from the perspective of the college. Programs increase enrollment at eligible and decrease it at ineligible colleges. College enrollment effects are consistent for both four-year applicable and community college programs. There are effects for local community college programs (but not local four-year programs), and for statewide programs of all types.

Program effects on postsecondary outcomes are well-studied, but findings are only modestly consistent. Between a half and a third of studies do not show positive impacts on college attendance, performance, persistence, or degree completion. There is the

most evidence (fourteen studies, out of twenty-two rigorous ones) to support the prediction that a free-college program increases any college attendance. While most of the research for these outcomes is on four-year programs, positive findings are neither restricted to nor universal among such programs. Free-college programs also moderately consistently appear to improve persistence and completion, but this appears to be entirely a function of their impact on enrollment. Evidence for program effects on performance, persistence, and completion *net of enrollment* is weak. Further research is needed to understand *when* free-college programs improve postsecondary outcomes.

Other program effects are either insufficiently studied, or too inconsistent, for confident statements to be made about them. We cannot say with any confidence that free-college programs improve academic performance before college. We would expect this to occur mostly with four-year applicable programs, but even for such programs, effects are at best small and often null. There is also not consistent evidence that free college programs reduce existing educational disparities by gender, race, or socioeconomic status. In fact, the dimension of inequality that is most consistently reduced by free college programs is prior academic achievement. But even here, we are drawing on just four studies (out of seven), and two are of one program (Knox Achieves).

Finally, there is insufficient evidence to claim that free college programs are effective economic development tools. These claims are most plausible for four-year, locally targeted programs, and it is mostly these programs that have been investigated. There are but a handful of studies, and findings are inconsistent and small at best.

Conclusions and further research

If we have entered the "era of free college", it certainly is so in radically attenuated form. Free-college programs are available in much of the country, but usually restricted to community colleges and to specific groups of potential students. This may help explain why the expansion of tuition-guarantee programs has occurred simultaneously with an historically unprecedented decline in college-going nationwide. Indeed, it is possible that enrollment declines have increasingly led colleges to offer "free college", while at the same time colleges' restricted revenue ensures that the new programs are minimally generous. We may be, paradoxically, in an era of both free college and of advanced austerity in college funding.

There is a large gulf separating statements made by free-college advocates (and by many researchers) and the research record on program effects (e.g., Miller-Adams & Iriti 2022). This is understandable. Program advocates want sets of policy changes, and so selectively and optimistically interpret the empirical base to support their goals. Further, their optimistic program claims may be based on best-case scenarios, like universal eligibility for coverage of most or all college costs at any public college, a situation approximated best by only a handful of the most generous existing free-college programs (e.g., the Kalamazoo Promise). At a statewide level, New Mexico's new universally available scholarship comes closest to free-college ideals. However, *most* really existing free college programs come nowhere near this model. One should not expect tremendous results from severely limited programs.

But, even the most generous programs fall far short of the high hopes of designers and advocates. The Kalamazoo Promise did not clearly revolutionize public schools in Kalamazoo, nor did it bring about a clear turnaround in the city's economic fortunes. Instead, it modestly increased college-going and degree completion by city youth while stabilizing, at least temporarily, the school district's enrollment. The importance of these outcomes should not be underestimated, but nor should the program's impacts be overstated. That researchers based in Kalamazoo have, after studying the program intently in its early years, essentially abandoned inquiry into it is highly telling. We do not even know if higher rates of college attendance are still to be found in Kalamazoo nearly two decades into the program.

Researchers, at the very least, should be cautious and qualified in their descriptions of free-college program effects. We can say with high confidence that a tuition guarantee will shift the enrollment destinations of those who were already college-bound. Where it shifts them depends on what colleges the program covers. This is straightforward and obvious enough but is, in itself, little to celebrate. We can also say that locally targeted four-year programs are likely to increase enrollment in the target school district (relative to enrollment in absence of the program). Such effects have only been investigated in struggling, disinvested districts, and it isn't clear what would happen in a different environment. The gains were large enough in Kalamazoo and El Dorado to stabilize district enrollments and likely district funding; gains were much smaller in other studied localities like Buffalo and Syracuse.

Promise programs were initially billed as economic revitalization tools, and after nearly twenty years, there is little evidence to support this characterization. Beyond stabilizing school district enrollment, there is simply little evidence of notable positive economic change resulting from even the most generous locally targeted programs. These programs certainly do not hurt anyone, and they likely help many, but they are clearly insufficient in themselves to reverse a struggling community's fortunes. This reality seems generally, if quietly, acknowledged, even by strong advocates.

Today, free college programs are mostly expected to increase postsecondary attainment. There is moderately consistent evidence for this, but many programs appear to have little to no impact. This may be owing to program design. Programs affect behavior if they alter perceptions of what is possible. To do so, they must be clear and striking. Programs which are overly complicated, which restrict eligibility too tightly, or which are insufficiently communicated to their target audiences are unlikely to generate much impact. But even when effects are positive, they are not very large. The most generous programs (and not all of them) tend to boost college attendance by around 10 percentage points, while less generous programs have effect sizes between 2 and 5 percentage points. Persistence and degree completion effects are more modest. This, I suspect, is because cost isn't the most impactful barrier to educational attainment (Voss et al. 2022). Even when college is "free", many remain either disinclined or unable to take it up. If the greater problem is one of adequate academic preparation, then investments in cognitive skills earlier in the life course (e.g., through prekindergarten) may be more efficient at boosting college enrollment than are tuition waivers.

The other outcome most expected for free college programs is inequality reduction. But here the research base is simply not supportive. We do not have clear or consistent evidence that free college closes gaps by gender, race, or socioeconomic status. There is little reason to expect tuition guarantees to close gender gaps (favoring women) among new high school graduates, and if anything a tuition guarantee aimed at adults is likely to boost female enrollment faster given lower average female incomes. That free college programs would reduce socioeconomic gaps is more intuitive, since reducing costs should have a larger effect on those for whom that cost reduction is greater relative to available resources. The expected reduction of race-based gaps is mostly a function of minoritized groups' lower average SES; otherwise we would have to postulate greater expected relative returns to education for minoritized groups.

It is interesting, then, that free college programs do not seem to consistently have a larger impact on lower-income students. To be clear, they don't consistently have a smaller effect either. I think there are three reasons for this finding. The first is mostly a data issue. Free-college *main effects* on outcomes are not particularly consistent or large in the first place. The data requirements for finding differences *between groups* in outcomes is considerably greater than for finding overall effects. The second has to do with program design and what has been researched. Plenty of free-college programs restrict eligibility by income, but few of these have been researched. Those which have, such as Washington's College Bound scholarship, have onerous early-commitment requirements that probably severely limit effective eligibility. If inequality reduction is

best brought about by income targeting, researchers simply haven't studied the correct programs to see if this is working.

The third reason is likely that it is very difficult to reduce educational inequality. Socioeconomic inequality begets unequal educational outcomes by numerous channels; differential resources become embodied in individuals themselves, built into the neighborhoods in which they live and encoded in the memories and dispositions of those who surround them. Waiving a single cost, even if it is large, may do little to equalize educational outcomes as consequential as college attendance and completion.

The purpose of this review is not to dismiss free-college programs or the free college movement's overall objective. To the extent that greater college attendance and its positive effects on individuals, communities, and society (e.g., McMahon 2009) is impeded by unclear college costs and upwardly biased cost estimates, free college represents a clear solution. To the extent that individuals underestimate individual returns to education, and underestimate or don't account for social returns, it makes sense to reduce college costs to individuals and families, perhaps even to zero. Intuitively it would seem likely that free college would equalize college access by socioeconomic status, but at present the research doesn't clearly support this conclusion. Cross-national evidence similarly challenges this commonsense notion. Murphy et al. (2019) show that the substitution of universal free tuition with an income-based grant-and-loan system in the United Kingdom did not expand socioeconomic disparities in participation, nor did it notably lessen participation rates

overall (Azmet & Simion 2017; Murphy et al. 2019). Similarly, the replacement of a means-tested system with a universal free-tuition system by Ireland did not lessen disparities in participation by social class, nor did it increase college participation (Denny 2010). In the United States, no-loan policies have had very small impacts on the socioeconomic diversity of selective colleges (Hillman 2013; Rosinger et al. 2019; Waddell & Singell 2011; Zhu et al. 2021).

On the other hand, to the extent that individual graduates can profit privately off their college-going, there are reasons to expect them to pay a share of the cost, perhaps through income-based loan repayments. And there are certainly good arguments against expecting those who do not attend college to subsidize others' college going and the increased incomes it will allow them to accrue.

My goal is to reassess claims against the accumulated evidence, not evidence cherry-picked to provide support for any given policy preference. Researchers interested in higher education policy, including free college or Promise programs, will hopefully find this of use.

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Tables

Table 1: List of promise/free college programs subject to empirical effect estimation, with number of studies and outcome effects estimated.

Program	Studies	Outcomes
State four-year		
Georgia HOPE	15	HS GPA, test; PS participation, destination, performance, persistence, completion; residential decision, community educational attainment; college enrollment, revenue, spending, price, degree production
Florida's Bright Futures	8	HS test; PS participation, destination, performance, persistence, degree, debt; residential decisions; college enrollment, degree production
Indiana 21st Century Scholars	3	PS aspirations, participation, persistence, completion
Washington College Bound	3	HS GPA, graduation, discipline; PS participation, destination, performance, persistence, completion
Massachusetts Adams Scholarship	2	PS participation, destination, persistence, completion; College enrollment
New York Excelsior	1	College enrollment
West Virginia PROMISE	1	PS performance, completion
Local four-year		
Kalamazoo Promise	11	HS attendance, test, credits, GPA, graduation, discipline, teacher & student perceptions; PS application, participation, destination, persistence, completion, income; SD enrollment; residential decisions, home prices,
Pittsburgh Promise	4	HS attendance; PS participation, destination, persistence; SD enrollment
New Haven Promise	3	HS attendance, GPA, test, graduation; PS participation, destination; residential decisions
El Dorado Promise	3	HS test; PS participation, completion; SD enrollment
Say Yes, Buffalo	3	HS graduation; PS participation, destination, persistence; SD enrollment, residential decisions, home prices
Say Yes, Syracuse	2	HS graduation; SD enrollment, home prices
La Crosse Promise	1	Residential decisions
The Degree Project	2	HS attendance, GPA, test, graduation; PS aspiration, participation, destination, completion
Multiple	2	SD enrollment, residential decisions, home prices

National Sample	3	PS aspirations; college revenue, spending, price
State community college		
Tennessee Promise/ Reconnect	7	PS debt; college enrollment, spending, price, retention rate
Oregon Promise	3	PS participation, destination, persistence; college enrollment, spending, retention rate
Missouri A+	2	PS participation, destination, performance, completion
Oklahoma's Promise	1	PS persistence
Local community college		
National Sample	4	College enrollment, revenue, spending, price
Knox Achieves	2	HS graduation; PS participation, destination, performance, completion, income
Tulsa Achieves	2	PS performance, persistence, degree
Milwaukee Technical College Promise	2	HS attendance, GPA; PS participation, destination, completion
Michigan Promise Zones (multiple)	1	SD enrollment; college enrollment
Anonymous	1	PS participation, persistence
Multiple	1	Community educational attainment
Public college four-year		
Illinois Promise	1	PS completion

HS=high school; PS=postsecondary; SD=school district; GPA=grade point average

Table 2: Studies included in this review, chronologically by program type, with methodology, program, outcomes, and outcome comparisons

Study	Year	Method	Program	Outcomes	Comparisons
State four-year					
Dynarski	2000	DiD	GA HOPE	PS attendance, destination	SES, race/ethnicity
Henry & Rubenstein	2002	Regression	GA HOPE	HS GPA, test scores	Gender
Rubenstein	2003	Descriptive	GA HOPE	PS performance, persistence, degree	
St. John et al.	2003	Regression	Indiana 21st	PS persistence	
Long	2004	DiD	GA HOPE	PS performance, persistence, degree	
Henry et al.	2004	Regression, matching	GA HOPE	College spending, price	
St. John et al.	2004	Regression	Indiana 21st	PS aspirations, attendance	
St. John et al.	2005	Descriptive	Indiana 21st	PS destination, persistence, degree	
Cornwell et al.	2005	DiD	GA HOPE	PS performance	Prior achievement
Cornwell et al.	2006	DiD	GA HOPE	College enrollment	Race/ethnicity
Singell et al.	2006	DiD	GA HOPE	College enrollment, revenue	SES
Harkreader et al.	2008	Regression	Bright Futures	HS test scores, PS attendance	
Dynarski	2008	DiD	GA HOPE & Arkansas	Community educational attainment	Gender

Goodman	2008	DiD; RD	MA Adams	PS attendance, destination	Prior achievement
Hickman	2009	DiD	Bright Futures	Residential decisions	
Zhang et al.	2011	DiD	Bright Futures & GA HOPE	College degree production	Gender
Scott-Clayton	2011	RD	WV Promise	PS performance, degree	
Sjolquist & Winters	2012	DiD	GA HOPE & Arkansas	PS degree	
Mendoza & Mendoza	2012	FE regression	Oklahoma's Promise	PS persistence	
Zhang et al.	2013	DiD	Bright Futures	College enrollment, degree production	Gender, race
Sjolquist & Winters	2013	DiD	GA HOPE	PS destination, residential decision	Prior achievement
Castleman et al.	2014	DiD	Bright Futures	PS attendance, destination, performance, persistence, degree	
Cohodes & Goodman	2014	RD	MA Adams	PS attendance, destination, persistence, degree; College enrollment	SES, race/ethnicity
Sjolquist & Winters	2015a	DiD	GA HOPE; other merit scholarships	PS degree	
Sjolquist & Winters	2015b	DiD	GA HOPE	PS major	Gender
Zhang et al.	2016	RD	Bright Futures	PS destination	
Fumia et al.	2018	DiD, IV, matching	WA College Bound	PS attendance,	Prior achievement

				destination, performance, persistence, degree	
Nguyen	2019	DiD	NY Excelsior	College enrollment	
Jones et al.	2020	RD	GA HOPE	HS GPA, graduation, disciplinary incidents	
Goldhaber et al.	2020	Tdiff	WA College Bound	PS debt	
Borg et al.	2021	Quantile regression	Bright Futures	PS attendance, destination, persistence, degree	
Long et al.	2021	Tdiff	WA College Bound	PS attencand, destination	SES, race/ethnicity
Gurantz & Odle	2022	RD	Bright Futures	PS attendance, persistence	
Local four-year					
Andrews et al.	2010	DiD	Kalamazoo Promise	college application destination	SES
Bartik et al.	2010	Descriptive	Kalamazoo Promise	HS test scores, school district enrollment	race/ethnicity
Miron et al.	2011	Descriptive	Kalamazoo Promise	HS teacher & student attitudes	
Gonzalez et al.	2011	Descriptive; DiD	Pittsburgh Promise	HS attendance, GPA; PS attendance, destination, persistence; SD enrollment	SES, race/ethnicity
Jones et al.	2012	Descriptive	Kalamazoo Promise	HS environment	
Hershbein	2013	Descriptive	Kalamazoo Promise	SD enrollment	

Bartik & Lachowska	2014	DiD & FE	Kalamazoo Promise	HS GPA, credits, disciplinary incidents	
Gonzalez et al.	2014	Regression; DiD	New Haven Promise	HS GPA, attendance, test scores, graduation, PS attendance	
Bozick et al.	2015	DiD	Pittsburgh Promise	PS attendance, destination	
Bartik & Sotherland	2015	DiD	8 programs	Residential decisions, home prices	
Bartik et al.	2016	Benefit-cost analysis	Kalamazoo Promise	PS degree,	gender, SES, race/ethnicity
Page & Iriti	2016	Regression, RD	Kalamazoo Promise	PS attendance, destination, persistence	SES
Daughtery et al.	2016	Descriptive, RD, DiD	New Haven Promise	PS attendance, destination	
Bifulco et al.	2017	Synthetic control	SY Syracuse	HS graduation, SD enrollment	
Sohn et al.	2017	DiD	SY Syracuse & Buffalo	SD enrollment, home values	Race/ethnicity
LeGower & Walsh	2017	DiD	22 programs	SD enrollment, home values	Race/ethnicity
Miller	2018	Reg, FE, DiD	Kalamazoo Promise	SD enrollment, home values	
Bifulco et al.	2019	DiD & cross-cohorts	SY Buffalo	HS graduation, PS attendance, destination, persistence	SES

Page et al.	2019	RD & DiD	Pittsburgh Promise	PS attendance, destination, persistence	
Collier & McMullen	2020	Descriptive	Kalamazoo Promise	PS persistence	
Ritter & Swanson	2020	DiD, matching,	El Dorado Promise	HS test scores, PS attendance, degree, SD enrollment	
Harris et al	2020	RCT	Degree Project	HS GPA, attendance, graduation, PS attendance, destination, degree	
Harris & Mills	2021	RCT	Degree Project	HS GPA, attendance, graduation, test; PS aspiration, attendance, destination, degree	
Bartik et al.	2021	DiD	Kalamazoo Promise	PS attendance, destination, degree	
Hershbein et al.	2021	DiD	Kalamazoo Promise	Employment, wages, residential decisions	gender, SES, race/ethnicity
Ash et al.	2021	Matching	El Dorado Promise	HS test scores	Prior achievement
Swanson & Ritter	2021	DiD	El Dorado Promise	PS attendance, degree	Race/ethnicity, prior achievement
Leigh & Gonzalez-Canche	2021	DiD	New Haven Promise, SY Buffalo, Lacrosse Promise	Residential decisions	

Odle	2022	DiD	National Sample	PS aspirations	SES, race/ethnicity
State community college					
Anderson et al.	2023	Interrupted time-series	MATC Promise	College enrollment	Race/ethnicity
Billings	2020	DiD & IV	Michigan Promise Zones	College enrollment	
Jochems et al.	2006	Descriptive	MO A+	PS attendance, destination	
Munoz et al	2016	DiD	MO A+	PS debt	
Nguyen	2020	DiD, synthetic control	TP	College enrollment, price	
House & Dell	2020	DiD	TP	College spending	
Gurantz	2020	DiD	OP	PS attendance, persistence	
Odle et al.	2021	DiD	TP	College enrollment	
Bell	2021	DiD	TP	College retention rate, enrollment, spending	
Hodara & Childress	2021	Descriptive	OP	PS participation, performance	
Odle & Monday	2021	DiD & synthetic control	TP	PS degree	
Collom	2022	DiD	TRct		
Lee et al.	2022	Descriptive	TP & OP		
Local community college					
Pluha & Penny	2013	descriptive	Anonymous LD schol	HS graduation, PS attendance, destination	SES, prior achievement
Caruthers & Fox	2016	DiD, matching,	KA	PS performance,	Gender, SES, race/ethnicity,

				degree, wages	prior achievement
Carruthers et al.	2020	FE, matching	KA	College enrollment	
Li & Gandara	2020	DiD	National Sample	PS performance, persistence, degree	
Gandara & Li	2020	DiD	National Sample	PS degree	Race/ethnicity, prior achievement
Ruiz et al.	2020	DiD	Multiple programs	HS attendance, GPA	Gender, race/ethnicity
Bell	2021	DiD	Tulsa	PS attendance, destination, degree	SES
Bell & Gandara	2021	DiD	Tulsa	SD enrollment, college enrollment	
Monaghan & Coca	2023	DiD	MATC Promise	PS attendance, destination	
Anderson et al.	2023	Interrupted time-series	MATC Promise	College enrollment	Race/ethnicity
Local four-year & local community college					
Delaney & Hemenway	2020	DiD	National Sample	College enrollment, tuition	
Delaney & Hemenway	2023	DiD	National Sample	College spending	Race/ethnicity
Public college four-year					
Gershenfeld et al	2019	Matching	Illinois Promise	PS degree	

HS=high school; PS=postsecondary; SD=school district; GPA=grade point average
DiD=differences-in-differences; RD=regression discontinuity; IV=instrumental variable; Tdiff=triple differences; FE=fixed effects regression
GH=Georgia HOPE; FBF=Bright Futures;

Table 3: Summary of findings for outcome estimates

Outcome	Studies	Rigorous	Rigorous & expected direction	Conclusion
Student, pre-college				
GPA/credits	8	7	3	Well-studied but inconclusive
Test scores	6	2	1	Insufficiently studied
Graduation	6	5	2	Well-studied but inconclusive
Student, PSE				
Attendance	26	22	14	Well-studied, moderate
Destination	21	19	15	Well-studied, consistent
Performance	9	7	4	Well-studied, moderate
Persistence	17	9	5	Well-studied, moderate
Graduation	20	15	9	Well-studied, moderate
Community				
School district enrollment	9	5	4	Well-studied, consistent
Residential decisions	4	4	3	Insufficiently studied
Home prices	4	4	2	Insufficiently studied
Community educational attainment	3	3	2	Insufficiently studied
Colleges				
Enrollment	13	12	11	Well-studied, consistent
Revenue	2	2	1	Insufficiently studied
Tuition/price	4	4	4	Insufficiently studied
Inequality				
Gender	8	6	2	Well-studied but inconclusive
SES	11	10	4	Well-studied but inconclusive
Race/ethnicity	15	13	6	Well-studied but inconclusive
Prior achievement	8	7	4	Well-studied, moderate

PSE=postsecondary education; GPA=grade point average; SES-socioeconomic status