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ABSTRACT

What Limits College Success? A Review and Further Analysis of Holzer and Baum's 'Making College Work'

Holzer and Baum's recent book, 'Making College Work: Pathways to Success for Disadvantaged Students,' provides an excellent up-to-date review of higher education. My review first summarizes its key themes: 1) who gains from college and why? 2) mismatch and the need for more structure; 3) problems with remediation; 4) financial barriers and 5) the promise of comprehensive support. I then critique the book's proposed solutions using some of my own qualitative and quantitative data. Some recommendations are worth considering, while others are too expensive or unlikely to make a meaningful difference without addressing the underlying lack of preparedness and motivation of college students. I argue that making mandatory some existing services, such as application assistance and advice, proactive tutoring and advising, and greater career transition support, has the most immediate potential.

JEL Classification: I2, J24

Keywords: college student achievement, returns to college, higher education policy, signaling

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I. Introduction

To prepare adequately for entering an increasingly competitive labor market, most parents and policy makers in the United States want children to enroll in and complete some kind of college education. Research on the benefits of higher education broadly support these goals, especially when comparing estimated pecuniary and non-pecuniary benefits from a college versus high school degree[1]. Many youth, however, don't get that far. College enrollment rates are levelling off at around 70 percent and, among those who do enroll, completion rates are only around half.[2] The need to improve these numbers, as well as improve the experience within college itself, is considered one of the greatest challenges in education today.

Harry Holzer and Sandy Baum's book, 'Making College Work: Pathways to Success for Disadvantaged Students,' (MCW) lays out a plan for addressing these challenges. Holzer, Professor of Public Policy at the McCourt School of Public Policy at Georgetown University, and Baum, Senior Fellow in the Center for Education Data and Policy at the Urban Institute and previously Professor of Economics at Skidmore College, have dedicated years to this study and are well positioned to offer a definitive guide. Their book provides the first unified set of facts about college attainment and offers a comprehensive summary of where the research rests, so far, about how best to help improve higher education, especially for those from disadvantaged backgrounds. The book's target audience is policy makers and school administrators looking for actionable reforms to try, but any economist interested in higher education will find it a good read for catching up on the most recent issues and the proposals in play for improving achievement outcomes.

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[1] Oreopoulos and Petronijevic (2013).

[2] From the National Center for Education Statistics (NCES, 2017), in 1960, only 45 percent of individuals ages 16 to 24 who graduated from high school or completed a GED went to college, but by 2005, this number was 69 percent. However, by 2016, it had crept up to only 70 percent. Four- and six-year graduation rates among those entering first-time, full-time bachelor's degree programs at 4-year postsecondary institutions in 2010 were 41 and 60 percent respectively. Among those entering 2-year postsecondary institutions, 4-year graduation rates were 30 percent (NCES, 2017).

Holzer and Baum are quick to point out that researchers and administrators have not yet worked out all solutions for helping more youth benefit from higher education, but enough thoughtful and convincing research now exists to make it worthwhile to gather the literature together in one place to promote discussion. Their stated goal is to "bridge the gap between the academics pursuing definitive answers and the policy makers who must make immediate progress on solving these critical problems." (P8). The magnitude of impact of their prescribed reforms is unclear, largely due to uncertainty around how lack of academic preparation limits students' ability to benefit from them. The authors offer cautious optimism that there exists room for improvement even among the less prepared, and especially among those from disadvantaged backgrounds.

The book is divided into two parts, helpfully separating the discussion between causes of and solutions to poor college performance. The first part covers a cohesive list of facts about the college pathway, from entry to graduation. The authors not only gather the relevant research to compile these facts, but produce new descriptive data from the Beginning Postsecondary Students Longitudinal Study (BPS), which allows them to create a united analysis and divide trends into categories of students, such as by family income, dependency status, and race. They offer a comprehensive list of suspects for the causes of poor college performance. These include enrolling in colleges that lack resources for student services, fields of study associated with low financial returns, requiring remediation courses before being allowed to take courses for program credit, family obligations, and a need to work.

The second part of MCW details possible solutions. To those familiar with the higher education policy literature, many of the proposals will come as no surprise—proposals to add more structure and simplify administrative processes to make it easier for students to end up at colleges and programs that likely offer greater returns; improve the remediation process; strengthen financial aid; and offer more supports and services. More novel ideas are also discussed, such as paying institutions based on performance and strengthening vocational training for students at risk of failing bachelor's degree programs. The authors never directly compare these options and I was left unsure about which ones they think are more cost-effective or realistically possible to implement. I was also left unsure about the quality

of the evidence for some of the recommendations because the book mostly cites supporting research rather than describes its quality. Nevertheless, I found the book an accurate and comprehensive report about where the mainstream research currently stands on the debate for improving higher education.

For the remainder of this review, I first summarize in more detail a few of the book's key themes that I found especially noteworthy: 1) who gains from college; 2) mismatch and the need for more structure; 3) the unintended negative consequences of remediation and how to avoid them; 4) financial barriers, and 5) the promise of comprehensive support. I then move on to critique the book's proposed solutions using some of my own data. Some recommendations, I think, are highly worth considering: for example, offering more guidance for applications, and improving remediation structure. Others are likely too expensive to expect administrators to take them seriously. I also conclude that some recommendations are unlikely to make a meaningful difference without addressing the underlying lack of preparedness and motivation of college students themselves. I will draw on a large qualitative and quantitative survey of at-risk college students to make this argument. Asking students directly about their own challenges in college, their goals, how they make decisions about where to go, what to study, and what they think would improve their situation, produces fascinating insights for how to think more about limits to college success. Hopefully the reader will find this summary and discussion helpful.

II. Major Themes

Theme 1. Would everyone gain from going to college?

MCW begins with the premise that college completion benefits virtually everyone: "it has become difficult for workers to succeed in the American job market without some type of college credential". [P2] Completion, here, is key. By the author's own estimates using Florida administrative data and conditioning on observables such as race, family background, and high school performance, graduates of bachelor's degrees, associate degrees, and certificates earn 71, 37, and 30 percent more compared to high school

graduates respectively. These estimated returns are in line with a few recent studies, including one using a more quasi-experimental design.[3] However, earnings for those with some college but without completing a program are not that different from those with only a high school degree: "incorporating the return per credit earned, our calculations suggest that average community college non-completers earn just a 4 percent return over what they would earn with a high school diploma." (p.81). Other datasets also find only small differences in earnings between college dropouts and high school graduates, especially comparing the median or lower percentile students from each group (Oreopoulos and Petronijevic, 2013). This is likely why estimated returns from enrolling in college are significantly less than estimated returns from completion, especially for those from disadvantaged backgrounds.[4] Getting students to pick programs they will finish, therefore, is important, and any goal of increasing college attainment should be modified to one of increasing college completion.

Low completion rates are especially concerning at community colleges. MCW displays data from the National Center for Education Statistics that indicate only a quarter of students who first enrolled in 2003-04 in a public two-year program actually finished any program within six years. One possible factor behind these low rates is an overemphasis on encouraging enrollment in general studies programs as an inexpensive path to eventually transferring to 4-year colleges. About 80 percent of those entering community college say they intend to later transfer to a 4-year institution (Horn and Skomsvold, 2011; Jenkins and Fink, 2016; Monaghan and Attewell, 2015). A 4-year degree may be more associated with higher earnings, but if pursuing one from community college makes it more likely to not complete at all, perhaps focusing on a more direct career path from completing a 2-year program would be a better start. Hotzer and Baum agree that more structure and guidance is needed: "Community college leaders with

[3] Ost et al. (2018), Belfield and Bailey (2017), and Altonji and Zimmerman (2017).

[4] Zimmerman (2014) estimates an average return to enrollment at a 4-year college of 22 percent for those at the margin of admission. Backes et al. (2014) conclude that disadvantaged students more likely to end up in general humanities programs at 2-year colleges have both low completion rates and low compensation afterwards. Some of the research cited in MCW on the returns to college is several decades old and likely outdated. More recent evidence that addresses endogenous selection issues is frustratingly sparse. There certainly exists more room for research in this area to get a clearer picture of the extent to which youth gain from college, and distinguishing these gains by type of program and family background.

whom we have spoken about their efforts to improve outcomes are unanimous in pointing to the lack of direction as a central cause of low completion rates. Students who enroll with at least a broad idea of the career to which they aspire are more likely to be on a path to success than those who have only a vague idea that they need some sort of credential". (P43). I'll return to this theme below.

Program of study also matters.[5] In fact, some recent research suggests that what students choose to study in college matters more than which college they choose.[6] Using program admissions thresholds for students already going to college, this work finds large earnings gains from marginal acceptance into fields such as science, business, and economics, compared to others. Holzer and Baum provide their own analysis using Florida administrative data. They also estimate that some programs are more lucrative than others. For students at 2-year colleges in particular, those who graduate with associate degrees or certificates specializing in STEM, health, business, and occupational fields fare much better than the larger fraction of students enrolled in humanities or general studies. Holzer and Baum note, "While our analysis cannot totally isolate [selection] factors from the credentials earned as causing the earning differentials, the fact that we are able to control for so many background characteristics suggests that many students could increase their earnings if they chose different fields of study." Preferences may explain some of these choices, as students accept lower earnings in favor of jobs they enjoy more, but a conclusion from this work is that opportunities may exist for setting students on more prosperous career paths by better informing them about these differences in returns.

Largely missing from Holzer and Baum's discussion about the financial benefits of college is what causes them. Skills required for some occupations, such as carpenter, computer programmer, and nurse, can often be directly linked to college courses. Many occupations also rely on more general skills, such as critical thinking, creativity, teamwork, and writing, whose origins are harder to trace and could have been developed prior to postsecondary enrollment. The debate on whether returns to college are more from

[5] Altonji, Blom, and Meghir (2012) provide a more detailed review of this specific topic.
[6] Hastings, Neilson, and Zimmerman (2014), and Kirkeboen, Leuven, and Mogstad (2016).

signaling skills already possessed, than from human capital development, has not been resolved.[7] That may be because college serves more than one type of student—some approach their studies with intellectual curiosity and a goal of mastering material in order to pursue a future satisfying career, while others try to keep up with material enough to graduate, but also emphasize activities outside of class as important for enjoyment and personal growth. There exists evidence of both signaling and human capital models for explaining positive returns to college[8], and it may be impossible to fully discern which of the two matter more and when.[9] Hopefully future research will shed additional light on this problem. However, rather than prescribe less public investment towards college because we don't understand the production function well (which would increase inequality dramatically), I think a more fruitful direction comes from investigating how to further make college more about skill development than a signal. Many of the reforms prescribed in MCW aim in this direction, even for students not expecting top grades.

Theme 2: Mismatch and the need for greater structure

Students face many choices along the college path with thousands of options and significant long-term consequences. Those who plan to attend college must choose schools, complete applications and pay application fees for each, and often must choose to take standardized assessment tests (like the ACT or SAT) and write entrance essays. Those in financial need must complete an application for assistance and may benefit from applying elsewhere for scholarships, awards, and additional financing. Students must choose which offer to accept, decide how to manage their financial aid, register and pay fees. Once in college they must choose only one program they want to complete, and ensure they enroll and pass the

[8] See Caplan (2018) for discussion and evidence of signaling in college. Lange and Topel (2006) discuss evidence in favor of human capital development.

[9] Lange (2007) makes an impressive attempt and concludes that the return to schooling comprises about 30 percent a signaling effect and 70 percent a human capital effect. These values, however, are sensitive to his underlying assumptions about common wage dynamics across different worker types, and rely on decades-old data.

courses required to complete it. Then students have to remember to renew their financial aid and choose how to manage their time to study, work, meet with friends and family, participate in clubs and eventually think about transitioning out of college and finding a career.

A central theme in MCW is that students make these choices often with limited (or misleading) information and lack of guidance. As a result, some apply to only one institution or to non-selective schools because they think, incorrectly, they are less costly. Some fail to consider alternative, more attractive, programs because they are uninformed. Students end up mismatched into less suitable paths that weaken their chances for success. Those from families without college experience, or in high schools with less available help, are especially disadvantaged: "since individuals derive a great deal of information and assistance from their social networks, a lack of effective or knowledgeable social networks related to higher education will deprive them of both." (p 42).

MCW describes how consequential mismatches can be. For example, colleges differ substantially by how many students they admit from low-income backgrounds and how well their attendees end up doing in the labor market. Some admit many disadvantaged students who also go on to thrive in the labor market. Other colleges observe far fewer of these entrants placed in high-paying jobs. (Chetty et al, 2017). The book provides corroborating evidence that students with similar academic achievement but low-income family backgrounds end up at colleges and fields of study with lower completion rates than those with high income family backgrounds. More research is needed to determine the extent to which students could benefit from being redirected to different colleges or programs, but the evidence MCW offers is highly suggestive. The authors note that "even some stronger students face two obstacles to making the choices in college that will lead to the best financial outcomes. They do not know which associate degrees and certificates the labor market rewards, or whether they would enjoy and succeed in employment in those fields. In other words, these students lack sufficient information about relative rates of compensation, as well as about the nature of the work in different fields, to make fully informed decisions." (P 87)

To redirect students towards actions associated with better outcomes, Holzer and Baum recommend nudging. Nudging, a term commonly used in behavioral economics, refers to restructuring an individual's

environment to make some outcomes more likely than others while not significantly altering options or costs. The college application process provides the best example. Several studies demonstrate how making it easier to apply—offering assistance filling out the form, providing time during class to work on it, sending reminders—makes the difference for some in whether they end up enrolled in college or not (e.g. Bettinger et al., 2012, Page and Gelbach, 2017, Oreopoulos and Ford, 2019).

Some recent policy reforms move in this direction, but there certainly seems to be more room for simplification and better information. Students could be made better informed about alternative college pathways, including STEM majors and vocational programs. Particularly promising, I think, is the potential to offer more advice about where to go. Research and machine learning methods are getting better at predicting where students would have the best chance for academic and labor market success based on preferences and past performance. Students could use this information to consider when and where to apply, including colleges and programs they might not have considered otherwise. Also promising, the authors note, is the practice of simplifying the message to low-income families about the affordability of college: "Preliminary evidence suggests that the simple message that college will be paid for has a significant impact among students who might not otherwise enroll." (P134) One idea the book proposes is automatically determining Pell Grant eligibility for students about to graduate high school, as a means to make the opportunity of attending college seem more of a possibility. Governments or administrators could even direct attention to colleges that students are likely to get into, cost little, and exhibit high completion rates.[10]

Evidence of successful nudging in education comes more from encouraging one-time actions, such as completing an application, than from affecting habits, such as increasing studying (Oreopoulos and Petronijevic, 2019). Cost-effective nudges are usually due to small costs rather than large benefits. I am, therefore, skeptical whether nudging can meaningfully address the low college completion rate problem.

[10] Dynarski et al. (2018) conducted a randomized controlled trial with the University of Michigan to try this for a sample low-income, high-achieving SAT takers, and found markedly increased college enrollment the following year.

A more promising approach, also emphasized in MCW, is to create a more "guided pathway" to the college process by making desirable actions more required or, at least, more difficult to avoid.[11] Louisiana and Texas, for example, now require each graduating high school senior to complete a college financial aid application or have a parent submit a statement of nonparticipation. Guttmann Community College also offers an excellent example of how greater structure might improve academic outcomes. The school requires applicants to attend a lengthy information session and one-on-one counselor interviews before being even considered for acceptance. Those accepted must enroll full-time, meet with an advisor regularly, choose from a limited number of programs, and take a fixed set of courses in their first year, including a Summer Bridge Program. No study has evaluated the effectiveness of Guttmann's program, but it is worth noting that the three-year graduation rate of its inaugural class was 49 percent, significantly higher than the three-year national graduation rate average of 22 percent at 2-year public colleges.[12] Colleges could also consider incorporating mandatory tutoring or advising into their course curriculums, or require students to first choose a full set of courses that would put them on track to graduate on time and later give them the option to drop some courses if necessary.

Finally, MCW mentions the need for more structure around the transition out of college: "[M]ost community colleges tend to have relatively unstructured environments in which students are able to make a very wide range of choices with very little guidance. Students receive too little advising about both academics and the labor market to make well-informed decisions. The lack of structure likely generates low labor market earnings among many of those who complete degree programs, as well as low completion rates." (P87). More guidance about how to effectively search for jobs could help shorten unemployment and generate matches with better long-term career trajectories. More opportunity to explore different careers might also lead to better decisions and generate more mature attitudes around what students want out of their college experience.

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[11] This approach restricts choice, so is less of a nudge and more of a shove. For more details on the case for more structure in college, see Scott-Clayton (2015).

[12] https://nces.ed.gov/programs/digest/d17/tables/dt17_326.20.asp

Some caution may be needed in thinking about these reforms. Colleges may begin to look more like high schools. More structure may reduce some of the benefits of providing students with more independence. Some students thrive with more freedom to choose what they learn and how. A trade-off may exist, therefore, from imposing fewer choices, more guidance, and more routine in order to promote higher education to youth who require more assistance.

Theme 3: Problems with remediation

Many community colleges provide open access, meaning that they admit any applicant into at least a general studies program with a high school degree. This level of access increases opportunity for all graduating high school seniors to pursue higher education at a relatively low cost. The downside is that many entrants are not well prepared to handle the academic standards of their program. The same colleges therefore often require entrants to take remedial math and English courses before being allowed to take courses that would contribute towards a degree or certificate in their desired program. "About 68 percent of students entering public two-year and 40 percent of those entering public four-year colleges in 2003-04 took at least one remedial class by 2009." (P 21) Freshmen find themselves feeling stuck working on subjects they covered earlier and concerned about the longer road they face to completion.

College dropout rates for those taking remediation courses are shockingly high—Jaggars and Stacey (2014) report a 72 percent dropout rate among community college students who take a remedial education course. Adams et al. (2012) use data from 33 participating states and find a 65 percent overall dropout rate by sixth year for students taking remedial courses. Those who require remediation are obviously less prepared and less likely to graduate compared to those who don't require it, but a consensus of policy researchers agree that reform is needed to avoid discouraging these marginal students facing long delays to complete.[13]

[13] Bailey et al. (2013).

MCW mentions several recommendations: “Abandoning remediation for all college bound students may not be a constructive approach. It is likely to be more successful with students with moderate gaps in preparation than with those whose skills are far below those required for college-level work.” (P 141). Instead, “A constructive approach may be to move away from general policies applying the same requirements to all students, instead determining the need for developmental coursework in the context of what students intend to study.” (P 140). Students preparing to become child care workers, for example, may require remedial English but not remedial mathematics, so there is less need to require it.

The book mainly recommends minimizing disruption by allowing students to receive remediation alongside other required courses or as complements. Many colleges are moving in this direction already. The California State University System (CSU) replaced traditional remedial classes with two-semester-long versions of credit-bearing courses, designed to be taken alongside a support class, rather than sequentially. Also new, high school transcripts are used for determining remediation rather than single-day tests that are often taken with little or no preparation or familiarity. The CUNY START program offers another example for assisting unprepared students. Those with large gaps in preparation postpone college entry for one semester and instead participate in an intensive reading, writing, and mathematics program, combined with academic advising, tutoring, and skill building for a nominal fee.

The traditional remediation system slows down students’ path to completion, but is it the main factor for explaining early exit behavior? If it were, we should observe lower dropout rates among students who do not take remediation, especially given a selection bias towards more qualified and able students. The limited sources of data that exist suggest that dropout rates for students not taking remedial courses are indeed lower, but not substantially so. Jaggars and Stacey (2014) report a 72 percent dropout rate among community college students who take a remedial education course compared to a 57 percent rate for students who do not take any remediation. Adams et al. (2012) use data from 33 participating states and find a 65 percent overall dropout rate by sixth year for students taking remedial courses and a 44 percent dropout rate for students not taking remediation. Rates remain high for students not taking remediation, whether traditional or nontraditional, vocational or non-vocational. Selection bias is also a major challenge:

those who end up requiring remediation are likely less motivated already than those not requiring it, and holding this and other characteristics constant to isolate the remediation effects is difficult. More credible research is needed to determine the kinds of reforms that best balance the dual goals of improving skills and completion rates.

Theme 4: Financial barriers

Chapter 4 of MWC covers financial barriers to college success. It nicely details, with better clarity than earlier summaries I have come across, the complete costs of different college options, factoring in not only tuition and fees, but also books and supplies, transportation, and living expenses. On the revenue side, the reader is struck by the many different sources of financial aid, and how available amounts depend crucially on the type of college being considered. Low-income students attending more selective 4-year colleges must rely more heavily on direct assistance from the college itself to offset the often very large sticker price. For public 2-year and 4-year colleges, grant aid from federal and state sources likely covers costs of tuition and fees, but not living expenses. The book notes that the largest component of the true cost of going to college is often foregone wages and work experience, putting pressure on some students to maintain active employment while trying to get by with their studies.

Would increasing the amount of grant aid increase access and completion? MWC interprets correctly that "[r]eviews of the literature on this subject usually conclude that the evidence is inconsistent but that well-designed student aid programs hold promise for improving college completion." Many previous studies on the effects of grant aid have found small or no impacts, but more recent research suggests a stronger consensus that credit constraints influence college decisions and that grant aid improves both attainment and completion.[14] These newer findings may be a result of substantial increases to tuition

[14] For example, see Lochner and Monge-Naranjo, 2012, Denning et al., 2019, Solis, 2017, and Lovenheim, 2011.

costs. Family income also has become a stronger predictor of working while in school and enrollment in 2-year over 4-year programs.

Ultimately, MCW concludes that more financial aid would not solve the college completion problem on its own: "Financial barriers do not entirely explain students leaving school without degrees … Additional funding cannot eliminate differences in academic preparation, expectations, support networks and life circumstances." (P113-114). This does not mean, however, that there is no room for improvement to the process of making existing aid available to students. Indeed, MCW and other researchers attribute some of the ineffectiveness of college financial aid to the complexity of how to get it. "[T]he complexity of the Pell Grant program appears to limit its impact. Students and families lack information about the benefits they might receive and have to complete a complex application process in order to get specific information and access to funds." (P111-112). Difficulty navigating college funding may explain why many students who would be eligible for financial aid do not complete the application process. Table 4-5 in MCW, for example, shows that 40 percent of independent students attending college and 36 percent of dependent students from families with incomes of $30,000 or less did not apply for federal aid for the 2011-12 academic year.

New research demonstrates how the process of receiving (and paying back) financial aid matters, even holding constant aid amounts. In one study, high school seniors already likely to receive free tuition from completing the University of Michigan's regular financial aid application process were markedly more likely to apply and attend when proactively encouraged to apply with the promise of free tuition if they were accepted (Dynarski et al., 2019). Another study randomly mentioned in a letter to accepted applicants their loan eligibility instead of requiring them to look this up on their own, and found a 40 percent increase in the likelihood of taking up a loan, followed by a significant increase in GPA, credits earned, and transfers to four-year colleges (Marx and Turner, 2017). These kinds of studies suggest that many students from low-income families may not realize their eligibility for assistance to substantially lower and even eliminate their college costs, especially at more selective colleges and ones that offer more student services and higher

completion rates. Making financial aid more salient and easier to process, therefore, is a low-cost effective strategy worth pursuing.[15]

The book also recommends more funding for 2-year public colleges. It notes the much lower and declining per-student government appropriations for these schools versus 4-year. "Many [students] enroll in underresourced institutions with poor records of success and without a peer culture of high academic achievement … While high prices and high debt are central issues for students in the for-profit sector, institutional resources may be the most serious in the two-year public college students. Because colleges in this sector have much lower per student revenues than other types of institutions, they are too often unable to offer students the strong guidance and support they need to succeed in college." (P115). They may also be unable to offer enough courses for students to meet program requirements on time.[16]

One of the most novel recommendations of MCW is to tie more funding to performance indicators. The authors suggest, "To strengthen the incentives of public institutions to improve student outcomes, states should base a portion of their subsidies to public colleges and universities on these outcomes." (P174). They also mention the many challenges of implementing such programs; incentives to raise graduation rates or earnings could lead to unintended negative responses. The book notes that measuring the true labor market value of colleges remains elusive. It recommends that we keep trying, but cautiously.

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[15] This approach includes making financial loans easier to pay back. MCW considers income-driven repayment (IDR) schemes, through which students repay their loans over a longer period like a mortgage, and tied to their incomes. The book notes we do not have clear evidence that these programs would improve college success. They are also challenging to implement. Nevertheless, I think they are worth considering as well. Barr et al. (2019) present pros and cons.

[16] MCW briefly mentions the potential for online courses to increase access and course credit: "The spread of online learning options creates opportunities for students to earn credentials despite geographic and schedule constraints. Online courses take a variety of forms, from the large-scale, impersonal massive open online courses (MOOCs) to intense personalized interactive learning. Although it is reasonable to be optimistic about potential cost savings, these savings have yet to materialize." (P187) Although online courses have not yet shown promise for improving learning outcomes, they are less costly than in-person courses and, therefore, potentially more cost-effective. Hybrids that combine both in-person and online instruction show particular promise. Education technology more generally may develop to offer new ways for improving higher education. Escueta et al. (2017) provide a detailed review.

Theme 5: ASAP and the benefits of offering comprehensive student support

Exhibit A for demonstrating how to improve college access and success is the Accelerated Study in Associate Program (ASAP). MCW and many other researchers point to it as the central example worth considering. ASAP provides incoming freshman an envelope of comprehensive support services, including tutoring, counseling, career advising, free public transportation passes, and funding for textbooks. Taking advantage of the potential benefits of more structure, students are required to meet regularly with their advisor and tutors, attend a student success seminar, and enroll full-time to participate. The program was experimentally tested on low-income students with remedial needs at CUNY in colleges where the 3-year graduation rate was only 20 percent. ASAP doubled graduation rates at CUNY, and similar impacts on persistence were replicated in Ohio (Scrivener et al., 2015; Sommo et al. 2018).

Other recent studies corroborate benefits from mandatory comprehensive services. Stay the Course, for example, is another college-based support system in which eligible students in Fort Worth, Texas, received regular intensive case management assistance along with emergency financial support. Completion rates for those eligible increased 3.7 percentage points (Evans et al., 2017). Bettinger and Baker (2014) evaluate the impact of Inside Tract, a program providing proactive, weekly, student coaching mostly via telephone. Students randomly assigned to the program were 4 percentage points more likely to graduate after four years compared to uncoached students. The Pathways to Education program, while directed towards high school students from low-income backgrounds, resembles ASAP in offering free public transportation and postsecondary financial aid in exchange for commitments to regularly meet with an advisor, access tutoring assistance, and attend character-building group events. The program significantly increased college enrollment, persistence, and eventual adult earnings and employment (Lavecchia et al. forthcoming).

The consistent estimated impacts from comprehensive support services are encouraging and suggest definite options for improving college success. Unfortunately, they cost thousands of dollars per student per year and are difficult to scale.[17] If we better understood how they improve academic outcomes, we could develop less costly, more pared-down programs to help. Evaluations of stand-alone student services are often found to be less effective. This may be because multiple services are needed to address multiple reasons for why students struggle, or perhaps participating in multiple services creates an important interaction and reinforces benefits. "Our top priority, then, should be to help community colleges implement the supports and services provided in ASAP, including career services, but in ways that are affordable and suited to their own populations and institutional characteristics. More experimentation with and evaluation of programs like ASAP, in different locations, and with different student bodies, will advance our knowledge of what works and for whom." (P156-157).

III. Policy Limitations

Holzer and Baum offer an impressive smorgasbord of policy options for improving college achievement in the United States. They mention so many that I am unsure which ones they believe are most realistic in the short run and which most promising in the long run. In summary, they suggest that colleges should improve "a range of supports and services for students at the nonselective institutions most will attend, especially community colleges, and by strengthening and reforming the institutions themselves." (P214). Of course, details, context, and costs all matter when we consider how best to carry out the improvements the authors recommend. In my opinion, making mandatory some existing services, such as application assistance and advice, proactive tutoring and advising, and greater career transition support, has the most immediate

[17] At just over $1,000 per student per year, Inside Track may be the most plausible program of the four mentioned for scale-up consideration. Perhaps targeting those most at-risk of not completing could further improve its cost-effectiveness. I hope similar studies to Baker and Bettinger can be conducted to further explore the program's replicability, external validity, and mechanisms.

potential. Developing a campus culture of inclusiveness, caring and high expectations could also help as it has at successful chartered schools.[18]

There are limits to how much policy reforms can help. Throughout the book, Holzer and Baum hint at this realization. For example, they comment, "[C]onstructive change will also require a healthy dose of realism. Even if we improve transfer mechanisms, the vast majority of students beginning in community college will likely not complete a bachelor's degree – and they should aware of the odds they face … In addition, since not every student will succeed in a "college-only" pathway, high school students should face a wider range of high-quality pathways from high school into postsecondary education and careers, including strong career and technical education and work-based learning." Below, I expand on some of these concerns about policy limitations, sometimes referring to a series of experiments and new data collected from surveying and interviewing college freshman at the University of Toronto.

Limits to how much colleges can afford

Among the evidence we have, comprehensive support programs such as ASAP offer the most promise for improving college completion, at least among community college freshman from disadvantaged backgrounds. The impact of ASAP is the largest I know of compared to other college program evaluations (MCW calls it 'our greatest success story'). The program represents an impressive 'proof of concept' for how much we could help if we offered a gamut of student support and made participation mandatory. As impressive as the results are—doubling completion rates from 20 to 40 percent—they also highlight serious policy limitations. Even with a full range of proactive mandatory support services and financial incentives to stay engaged, 60 percent of ASAP participants still did not complete. The best program we know, which MCW and many administrators feel is unaffordable, still fails to help more than half its target population.

[18] Chabrier et al. (2016), Angrist et al., (2013).

It may be that combining some less expensive version of ASAP with other affordable reforms could assist even more, though we have no evidence of that (so far). Other popular strategies include first-year seminars, online exercises to foster growth and belonging mindsets, learning communities, and virtual coaching. Anecdotally, they sound promising, but I am aware of no credible evidence that suggests they could make a large dent at increasing completion.[19]

Limits to how much colleges can help

To better understand the potential for policies to improve college completion and academic success, we need to better understand low-achieving student behavior. The production function of college achievement depends not only on college quality, financial aid, and support, but also on students' own inputs. Inputs such as preparation, motivation to do well, and interests outside of school will affect students' chances of success.

Past performance and non-cognitive abilities are, by far, the best predictors for college achievement. As a descriptive example, I draw on data Uros Petronijevic and I collected from a large sample of first-year economics students at the University of Toronto.[20] Students in this course were required to participate in an online warm-up exercise at the start of their school year and a follow-up exercise in the middle of it for in order to receive a small grade. Students were surveyed about their background characteristics and answered questions to measure their Big Five personality traits on both an absolute and relative scale, as well subjective beliefs about interest in doing well academically, education aspirations, and sense of belonging. Students were also asked in the follow-up survey questions about study-habits, stress, well-being, and time management. These data were linked to high school admissions data and course performance.

[19] E.g., Field (2018) and Oreopoulos and Petronijevic (2019).

[20] The sample is all first-year economics students at the University of Toronto who participated in the 2016-17 warm-up exercise' and 'follow-up survey'. See Oreopoulos and Petronijevic (2019) and Beattie et al. (2019) for more details.

Table 1 shows coefficient estimates from regressing students' standardized first year grade averages on student background, personality, and behavioral characteristics.[21] Column 1 indicates that a one standard deviation increase in a student's high school admissions grade is associated with a 33 percent of a standard deviation increase in first-year college grade average. No other variable considered does better than past high school performance at predicting future performance. The measured personality characteristics in the regression are generally believed to be fixed by adolescence. They are measured here on a relative scale, with each variable standardized; the omitted variable is Emotional Stability. Adding these characteristics to the regression only marginally improves the model's predictive fit, from an R-squared of 0.11 to 0.13. Conscientiousness—a measure of perseverance—is the strongest of the five traits at predicting college outcomes, which is consistent with previous literature.

The main point of Table 1 is that the skills and personalities students arrive with at the start of college are the most important predictors for academic performance. High school performance, in particular, dominates in predictive power over any other set of variables. Possibly more malleable attitudes or behaviors during college, such as student motivation and time management skills, are less marginally associated with grades and do not change the dominance of the other background variables. These patterns are clearly descriptive and do not imply direct causality, but they are in line with small program effects from student supports. We should not expect impressive gains from college support programs if the

[21] All variables, including the outcome variable, are adjusted to have mean zero and standard deviation one. High school grade is the grade average used for the college's entry decision. The Big Five personality traits are Conscientiousness, Extraversion, Agreeableness, Openness, and Emotional Stability. Locus of Control is a measure of how in control a student feels about their own life trajectory. Parental Education is the sum of a student's mother's and father's years of education attainment. Motivation is the average of two standardized variables: the extent to which students agree that it is important to do well academically in school (on a 1-7 scale), and an indicator for whether students aspire to continue their education beyond their current program. Mental Health is the average of four standardized subjective variables that measure how satisfied a student is with their life as a whole, how satisfied they are with their university experience, the extent to which they feel (not) stressed, and (not) depressed. Sense of Belonging averages a student's response to how much they feel they belong at the university and that the university supports them. Effective Study Habits averages a student's indication that they learn from correcting past mistakes, work with paper and pencil/pen when reviewing notes or textbooks, seek writing help, use tutors, meet with instructors, and think of their goal. Finally, Effective Time Management is the average of students' standardized reported typical weekly study hours, the standardized self-reported measure on the extent to which students feel they manage their time well, and the extent to which they feel they cram for exams.

characteristics most associated with performance are fixed at the time of entry, or if they have limited scope for change.

What do students say?

To better understand why students struggle and how different policies could help, we could ask students themselves. Economists often prefer quantitative research over qualitative, but the two can be complementary. Asking ASAP participants how they interact with the program might suggest specific mechanisms behind the large estimated effects, or opportunities for cost reduction or further improvements. More generally, trying to better document days in the lives of students could be useful for generating better theories of their decision making.

As an example, my sample of college freshmen were asked several open-ended questions at the end of their first semester while completing an online exercise.[22] The four appendix tables at the end of this article show random responses for non-international first-year economics students who received less than 60 percent during their fall term (below the 15th percentile grade for those who completed the course). Their answers help humanize the many real challenges, anxieties, and goals students face.

Table A1 shows random responses to the question: "What have been the biggest challenges to your academic success so far?" The common theme of struggling with time management is striking. By my count, 31 of the 50 responses relate to this difficulty (e.g., "So far, the biggest challenge to my academic success is being able to manage my time wisely and getting the right amount of studying done each day to ensure that I have all the material covered by midterm and final dates."). Other students mention struggling with mental health, lacking focus, and difficulty understanding material. Only one student specifically mentions part-time work as their main challenge.

[22] Students were required and encouraged to write thoughtfully—they were not allowed to complete the exercise without writing something in response to each question. Readers can review the actual online survey in more detail at https://studentachievementlab.org/.

Table A2 shows a different set of random responses to the question, "What could the University of Toronto be doing more to help?" Interestingly, the most common response (9 of the 25 listed) is nothing (e.g., "I think the college is doing fine and I don't think there is much more it can do." Many students acknowledge the student support services the university already makes available, essentially saying, 'it's not you; it's me'. Others suggest more one-on-one tutoring, workshops about time management and stress reduction (which the university actually already has), and more office hours. A couple of students also suggest that the university convey a more welcoming, less stressful environment.

I then asked poorly performing students what <u>they</u> could be doing more to help themselves (specifically, "What are you thinking of trying differently to help?". Table A3 lists 25 random responses. Not surprisingly, about half of them relate to improving time management, especially studying (e.g., "I am thinking of studying more often on a daily basis and studying more in advance for my tests and assignments"). Two students specifically suggest cutting hours of paid work. The majority of responses relate to either studying more or studying more effectively. Notably, only four students express plans to access additional student support or assistance.[23]

The open-ended questions clearly point to time management as a key challenge for many poorly performing students. To investigate further, we asked first-year economics students to report before the start of the winter semester their study time intentions and, by the middle of the winter semester, their actual study time during a typical school week (without an immediate midterm or final exam deadline). Figure 1 illustrates kernel density estimates of these two variables both for a sample of students with fall term grade averages less than 60 percent (those generally below the 15th percentile), and a sample with grade averages greater than 80 percent (those generally above the 75th percentile).[24] The dashed lines indicate planned

[23] This is in line with Beattie (2019), who shows very low-performing students are significantly less likely to access free (but voluntary) college resources than high-performing ones.

[24] The sample is first-year economics students from the University of Tornto in 2018-19 who completed two required surveys during the course as a grade requirement—one near the end of the fall term, when students were asked about their target weekly study hours the following semester during a typical week (with no immediate midterms or exams); the other done during the middle of the winter semester, asking students about their comparable actual weekly hours of study.

weekly studying. The differences between low and high performers lie mainly in the right tails. About half of high performing students plan to study at least 25 hours a week over all courses compared to 30 percent of low performing students. The continuous lines outline the distributions of actual reported studying. Not surprisingly, actual studying tends to be less than planned. Let's call this difference procrastination, but note that deviations could also happen from poor planning, distraction, or unexpected circumstances. Low and high performers procrastinate at about the same rate—5 to 6 hours a week, on average. Some caution is needed with these values due to possible measurement errors and being self-reported. Nevertheless, they suggest two interesting patterns: 1) Low- and high-achievers differ more by the amount they plan to study than by the amount they procrastinate; 2) Many students—even some who end up doing well—report actually studying very little outside of midterms and exams.

Low-performing students admit to time management problems and procrastination, but even when asked to plan their hours in advance, they often set low goals. Again, it is interesting to ask why. At the beginning of the 2018 fall term, students taking the economics warm-up exercise entered the number of weekly hours they planned to study for all of their courses during a typical week outside of midterms and exams. Many college administrators and faculty recommend two or three hours of study for each hour a student spends in class, implying 25 to 35 hours of effort outside of class for someone enrolled full-time (there is a reason they call it 'full-time' enrolment).

If students entered a plan with fewer than 15 hours of routine study, we asked "[W]e'd like to better understand how and why you decided on this number. Is it because you did not expect to gain much from studying more, or because you did not think you would have enough time, or some other factor? Please share your thoughts in a paragraph or two." Table A4 lists 25 of these responses among those who eventually ended up with a fall grade average less than 60 percent. A majority said they felt their target was fair and reasonable. Some justified their answer based on their successful high school experience; others said they wanted to leave room for sports, extracurricular activities, and friends. Very few of these students anticipated doing so poorly and none said they felt constrained from work. In fact, about half said they were intending to complete graduate studies in the future, 58 percent expected to receive above average

fall grades, and the average expected economics grade was 76 percent. It seems as though these students had the wrong reference point for sufficient study time. By the end of the semester, though, Uros Petronijevic and I (2019) show that these kinds of students update their academic expectations downwards, but rather than respond by planning to study more, they tend to accept their academic fate and plan to study about the same the following semester.

Interventions to improve time management

The responses above suggest college freshman might benefit specifically from interventions that try to motivate them to study more, and help them with time management. Over the last two years, my colleagues and I tried such an experiment using online exercises and virtual coaching. Treated college freshman were shown graphs and asked to read anecdotal stories affirming large academic benefits from studying at least 20 routine study hours each week. They were then guided through planning a general weekly schedule that included classes and sufficient study time. We made it possible for participants to download their schedule onto their electronic calendars and phones. We followed up by sending weekly email and text reminders about study sessions and upcoming tests. Treated students were also offered coaching by experienced upper year peers. Coaches sent weekly study tips through SMS text messages 'check-in' messages to ask participants about their experiences, challenges and ask questions. We also designed a smaller program with face-to-face coaching instead of through SMS. Treated students received a different online exercise emphasizing more general study advice, plus encouragement to meet each week with an experienced peer coach. Oreopoulos and Petronijevic (2019) provide more details.

Table 2 shows estimated treatment effects from the online plus virtual or face-to-face coaching programs compared to a randomly selected control group that received only an online personality test. The first three columns show results for the full sample of first-year economics students that were required and completed the warm-up exercise. The last columns show results for the sub-sample with high school admissions grades below the bottom quartile (less than 80 percent). As highlighted earlier in Table 1, these

students are more at risk of performing poorly. The table generally shows no significant effects. For example, average fall-term grades for the full-sample control group is 68.8 percent, compared to 68.5 for the time-management online and virtual coaching treatment, and 68.4 percent for the online study advice and face-to-face coaching treatments. Null effect estimates also arise when looking at year 1 credits earned and persistence into year 2. We also find null effects for the more at-risk group of first-year students from the bottom high school grade quartile. The one exception is a significantly positive estimated effect on year 2 persistence, which seems more likely due to statistical chance out of the 16 estimated effects than a finding worth getting excited about.

My main point of this analysis is to demonstrate the difficulty of designing programs to help college success. Based on MCW's recommendations for encouraging more structure and adding more student support, and my survey results above showing key challenges with time management, I think we should have expected detecting at least small effects from either program. Not finding any effects on the target outcomes is discouraging, but in line with other 'lighter touch' college program evaluations that find minimal or no impacts. More intensive interventions with mandatory supports or more expensive personal supports may be required for making a meaningful difference to college performance indicators.

IV. Conclusion

Holzer and Baum's recent book, 'Making College Work,' provides an excellent up-to-date review of higher education policy. Administrators looking for a comprehensive set of facts spanning from admissions to graduation to career will find it in MCW. Researchers seeking an up to date summary of current higher education policy studies, along with perceptive interpretation, will also value MCW. Finally, policy makers looking for a menu of options to consider for improving college attainment, especially for disadvantaged youth, can use MCW as a comprehensive reference.

I agree with much of the book's commentary, including its healthy dose of cautious optimism and acknowledgement that the problem of low completion rates in college will be difficult to solve. The consistent positive impacts from many comprehensive student support programs, such as the doubling of completion rates from the Accelerated Study in Associates Programs, may signal the kind of change we can hope for at a larger scale. These programs, however, are unrealistically too expensive. There may be room for lowering costs by incorporating new technologies, or triaging the most at-risk, or leveraging more experienced students to help younger students in a 'pay-it-forward' kind of way. Still, I find it concerning that more than half of treated ASAP students did not complete their academic programs, despite the envelope of guided structure, support, and incentives that they received.

Simplifying processes and encouraging students to complete one-time actions, such as filling out an application, selecting courses, or attending a workshop, are promising recommendations, backed up by a consensus of credible research. I am more skeptical about the promise of using these approaches to foster motivation and more continuous behavior, such as studying for improving longer term college success. The credible evidence of many college programs that MCW cites often indicates little or no long-term impact, including my own evaluation, mentioned above, of trying to nudge freshmen towards more effective study. Deeper operational change, such as improved teacher quality or pedagogy, may be needed. I am not aware of research that outlines how to credibly go about implementing systematic classroom reform, let alone test its benefits.

We may benefit by considering how to improve college preparation in order to improve college success. MCW makes the case that preparation goes only so far in determining worse college outcomes: "Weaker academic preparation among disadvantaged students is clearly a major explanation of these differences. But other factors contribute to their lower completion rates as well, including a lack of clear goals and direction, financial barriers, poor information and social capital, and pressure to work full time or deal with crises while supporting families." (P55). Some of these other factors may be relevant, but expensive to address. My experience is that it remains difficult to influence goals and motivation, build social capital, address family and relationship issues, and address weak preparation from within colleges.

In my opinion, making mandatory some existing services, such as application assistance and advice, proactive tutoring and advising, and career planning support, has the most immediate potential.

College success should not be defined solely by degree attainment, or even grade achievement. We must better understand how colleges add value and improve skills. A growing number of researchers rightfully worry that many college graduates benefit more from differentiating themselves from those without a degree than from acquiring long-lasting labor market skills. Qualitative and quantitative research investigating student decision making, learning in college, and what employers value in graduates, will improve our recommendations for how students and society can make the most out of the college experience.

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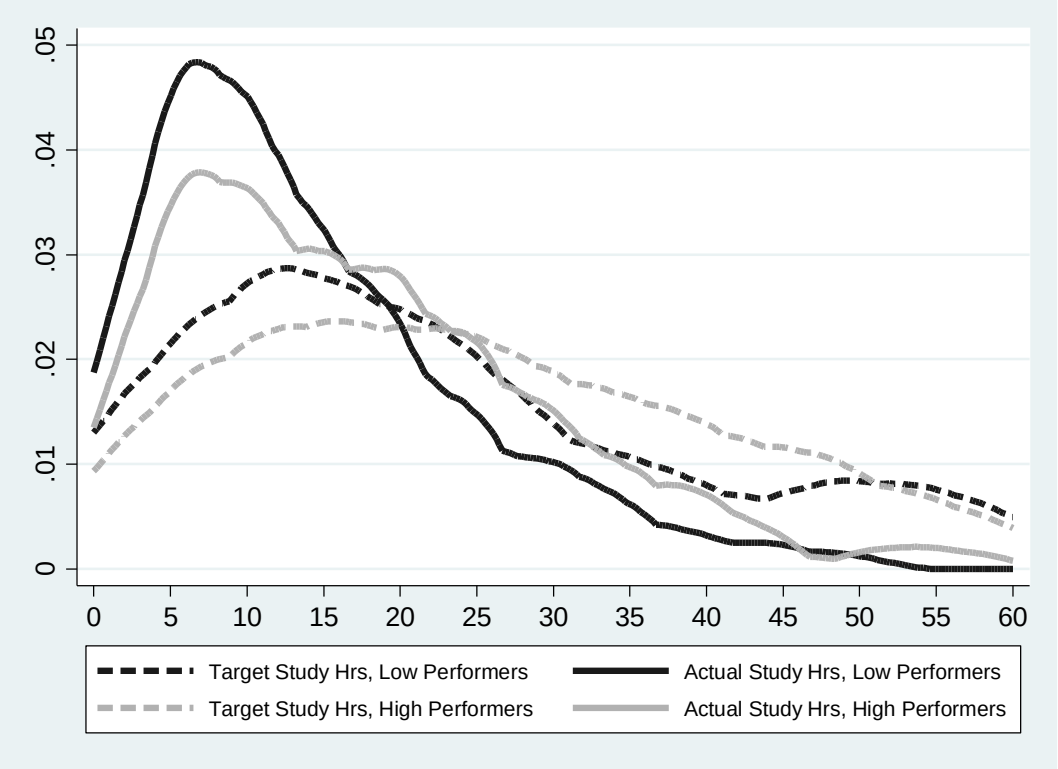
Figure 1
Target Versus Actual Reported Weekly Study Times
For High and Low Performing First-Year College Students



Notes: The sample is first year economics students from the University of Toronto in 2018-19 who completed two required surveys during the course (as a grade requirement). The dark dashed line indicates the kernel density estimate of target general weekly study hours in the next Winter semester for students with a Fall-Term average less than 60 percent, surveyed in late November 2018 to February 2019. The dark solid line indicates the corresponding actual general weekly study hours reported by these low-performing students. The light dashed and solid lines display the target and actual general weekly study hours for students with Fall-Term averages greater than 80 percent respectively.

Table 1
Some Student Background, Personality, and Behavioral Corelates of College Performance

Predictor Variables (all with mean 0, std 1)	**Estimated Coefficients from Regressing Standardized First Year Grade Average on Predictor Var. [Standard Errors in Square Brackets]**						
High School Grade	0.328 [0.027]***	0.313 [0.028]***	0.313 [0.027]***	0.3 [0.027]***	0.3 [0.027]***	0.303 [0.027]***	0.297 [0.027]***
Consientiousness		0.178 [0.037]***	0.137 [0.037]***	0.176 [0.037]***	0.176 [0.037]***	0.165 [0.037]***	0.133 [0.038]***
Extraversion		0.097 [0.036]***	0.066 [0.036]*	0.104 [0.036]***	0.104 [0.036]***	0.093 [0.036]**	0.087 [0.036]**
Agreeableness		0.1 [0.032]***	0.069 [0.032]**	0.107 [0.032]***	0.107 [0.032]***	0.103 [0.032]***	0.102 [0.032]***
Openess		0.147 [0.034]***	0.103 [0.034]***	0.145 [0.034]***	0.145 [0.034]***	0.142 [0.034]***	0.144 [0.034]***
Locus of Control		0.045 [0.029]	0.026 [0.029]	0.001 [0.028]	0.001 [0.028]	0.002 [0.028]	0.001 [0.028]
Parental Education		0.045 [0.028]	0.031 [0.027]	0.025 [0.027]	0.025 [0.027]	0.023 [0.027]	0.018 [0.027]
Motivation			0.162 [0.028]***	0.154 [0.028]***	0.154 [0.028]***	0.139 [0.029]***	0.135 [0.029]***
Mental Health				0.181 [0.027]***	0.181 [0.032]***	0.173 [0.032]***	0.159 [0.032]***
Sense of Belonging					0 [0.032]	-0.01 [0.032]	-0.015 [0.032]
Effective Study Habits						0.057 [0.030]*	0.015 [0.032]
Effective Time Management							0.11 [0.032]***
Sample Size	1,185	1,184	1,184	1,184	1,184	1,184	1,184
Adj. R-Squared	0.107	0.134	0.158	0.188	0.188	0.191	0.199

Notes: The table displays estimated coefficients from regressing first-year economics students' end-of-year grade average on the various predictor variables indicated in Column 1. All variables, including the outcome variable, are adjusted to have mean zero and standard deviation one. High school grade is the grade average used for the college's entry decision. The Big Five personality traits are Consientiousness, Extraversion, Agreeableness, Openess, and Emotional Stability. Locus of Control is a measure of how in control a student feels about their own life trajectory. Parental Education is the sum of a students' mother and fathers' years of education attainment. Motivation is a the average of two standardized variables: the extent to which students' agree that it is important to do well academically in school (on a 1-7 scale), and an indicator for whether students aspire to continue their education beyond their current program. Mental Health is the average of four standardized subjective variables that measure how satisfied a student is with their life as a whole, how satisfied they are with their university experience, the extent to which they feel (not) stressed, and (not) depressed. Sense of Belonging averages a students' response to how much they feel they belong at the university and that the university supports them. Effective Study Habits averages a students' indication that they learn from correcting past mistakes, work with paper and pencil/pen when reviewing notes or textbooks, seek writing help, use tutors, meet with instructors, and think of their goal. Finally, Effective Time Management is the average of students' standardized reported typical weekly study hours, the standardized self-reported measure on the extent to which students feel they manage their time well, and the extent to which they feel they cram for exams. The sample is all first year economics students at the University of Toronto that participated in the 2016-17 warm-up exercise' and 'follow-up survey'. See text for more details.

Table 2
Differences in Academic Performance from Random Assignment to Online, Virtual, and Face-to-Face Coaching

	All First-Year Economics Students			First-Years with HS Grades in Bottom Quartile (less than 80%)		
Outcome	**Control Mean [std. dev]**	**Time-Management Advice & Virtual Coaching**	**Study-Advice & Face-to-Face Coaching**	**Control Mean [std. dev]**	**Time-Management Advice & Virtual Coaching**	**Study-Advice & Face-to-Face Coaching**
		(mean diff. compared to control)			**(mean diff. compared to control)**	
Fall-Term Grades	68.8	-0.287	-0.431	62.3	-0.662	1.107
	[13.5]	[0.307]	[1.551]	[13.1]	[0.862]	[2.777]
Total Credits Earned, Year 1	3.1	-0.015	-0.018	2.8	-0.072	0.126
	[1.8]	[0.031]	[0.155]	[1.8]	[0.097]	[0.316]
Year 1 Grade Average	67.6	-0.459	0.283	60.9	-1.335	2.441
	[13.8]	[0.310]	[1.535]	[14.0]	[0.889]	[2.830]
Year 2 Persistence	0.804	0.007	0.049	0.795	-0.02	0.17
		[0.014]	[0.043]		[0.035]	[0.081]**

Notes: The table shows coefficient estimates from regressing the indicated outcome variable on an indicator for whether randomly assigned to receive an hour online exercise plus virtual coaching (that emphasizes the importance of study time management) or an on hour online exercise plus proactive face-to-face coaching (that focuses on academic success more generally). Fall-Term Grades are measured as a percent at the end of the fall term averaged over all courses completed in the first year of each experiment. Control means and standard deviations are also indicated. Two asterisks indicate statistical significance at the level. The sample size for all first-year economics students with fall-term grades is 15,970. The sample size for first-years with high school grades in the bottom quartile with fall term grades is 2,267. See text for more details.

Table A1: End-of-Term Random Sample Responses from Low Achieving First-Year Students to the Question:
"What have been the biggest challenges to your academic success so far?"

1	So far, the biggest challenge to my academic success is being able to manage my time wisely and getting the right amount of studying done each day to ensure that I have all the material covered by midterm and final dates.
2	Studying efficiently for hours and maintaining extra curricular activities besides studying
3	My biggest challenges for academic success here in University of Toronto is to maintain my GPA while having my social life which sometime makes things harder for me.
4	balance of school and life, being able to manage to fit in time to do everything.
5	The transition from highschool to University has been a hard thing to adjust to. There is something that constantly requires attention so there is a lot of multitasking. If you take attention away from one thing then the mark there deteriorates rapidly. So that was has been hard to manage.
6	Still really lost about what's happening with all my classes. I don't know what I'm doing. The transition from high school is more difficult than imagined; I'm very lost
7	I found it extremely difficult to get things done on time and to concentrate on tasks. I am extremely exhausted emotionally and mentally after ex last semester. I started to think that I might have ADHD, and I will go check in with a doctor in the near future.
8	lack of good study habits and discipline to be successful
9	to having a good study method, and manage times well of studying.
10	the biggest challenge has been that i'm on the edge of being on probation. However, I promised myself to do well this semester because i was lacking off in the first term. I was somehow lost and didn't know what to do and had just a little motivation. But now I've found my motivation, so I'm going to keep motivating myself and improving myself.
11	Staying consists with my grades. Usually towards the end of the semester when all the tests and assignments gets crammed together and it really wears me down mentally.
12	Lacking knowledge of how or what to study in order to be prepared.
13	One of the biggest challenges so far that has been having an affect on my academic success has been my part time job. As I am a mature student attending university the luxury of focusing on just school has been abolished and life altogether piles on thereafter.
14	Learning alone is not helping a lot. I hope all my assistant teachers are very nice and helpful.
15	wasting too much time on internet, afraid to talk to others even go to class.
16	Managing my time, and being able to give each course priority.
17	Finding motivation to actually sit down and study, in high school I got As without having to do any work or study.
18	My biggest challenge has been to manage my time wisely as I have not been able to show my full potential.
19	Following through with weekly lecture topics, and making sure to understand the topics by the week rather than cram at the end of the term for the tests.
20	job and time management are main things plus me being lazy cuz of this.
21	Staying focused. i find it very hard to concentrate especially when i kn ow i have multiple assignments due all of which are worth such a large percentage of each grade. nd up more comsumbed by anxiety that im unable to do any of them to my fullest potential
22	Stress from personal and family life. Not studying early enough. In the beginning I did not take the opportunity to meet with TAs and instructors frequently.
23	My biggest challenge in my academic success would have to be managing my time for studying and focusing.
24	Studying for exams and organising my many assignments. Also I have had challenges maintaining certain averages.
25	Trying to adapt to[college] and its way of obtaining success
26	I have been procrastinating on the courses that I find hard while I am doing well in the courses I am confident in. I understand that if I use my cellphone less then I will procrastinate less, and I don't want my cellphone to be more important than my success.
27	I think my biggest challenge for all is trying to understand what is prof's word
28	Time management is probably the most difficult thing in the college.
29	managing workload for all my courses in an organized way. Keeping on top of various assignments.
30	Learning the proper ways to study; reaching out to others; getting help from professors
31	- grades - academic problems with my full-time status -
32	I think it is reading issue, I don't have enough ability to totally understand the book.
33	a right way to study each subject due to the difference between different courses. when using a right way to study, the study result could be more time efficient and perform better.
34	My biggest challenges have been the transition and being able to keep up with the workload. I found the courses I am taking to be very difficult and I am finding it challenging to stay on top of everything.
35	Time management seems to be the biggest challenge so far
36	Trying to stay up to date with all the different assignments and tests in all of my courses
37	Transitioning from high school to university first year and adjusting to the new workload and types of classes.
38	The amount of work required for each class can at times be overwhelming.
39	Management course was extremely boring and hard to connect the materials taught in class to the tests.
40	My biggest challenges have been managing time and keeping up with due dates. Being more organized.
41	English and understanding. specially in the class, because English in more difficult than I think.
42	It is hard to understand the questions and lectures of the professors
43	My biggest challenges to my academic success is to get into what program I want because my gpa is quite low for apply to the program.
44	Trying to catchup with topics, I did not cover in high school, and at the same time, learning new chapters that cannot be understood without the background knowledge.
45	Staying on top of the material and understand what is being taught during lectures.
46	depression
47	Understanding, paying attention and trying to comprehend what the professor is saying.
48	from my last year of high-school, and seem to have lost most of my motivation that brought me through the first three years of high-school.
49	im just fucked right now i gotta get my shit together
50	I have very little motivation to study. I am actively a social person and often times put other activities before my studies.

Notes: Sample is non-international first year economics students at the University of Toronto in 2016 who received less than sixty percent during their fall term and participated in a warm-up and follow-up survey (both with a grade requirement). See text for more details.

Table A2: End-of-Term Random Sample Responses from Low Achieving First-Year Students to the Question: "What Could [the College] be Doing More to Help"

1	I think the college is doing fine and I don't think there is much more it can do
2	Provide programs that are more centralized rather than just for the sake of getting a pre-requisite.
3	Nothing really, they provide all the services a student needs like counselling, guidance, academic advisor, academic success centre.
4	Make help more 1 on 1
5	the college is already doing everything to help, i just need to use the resources.
6	Actually being supportive instead of telling you that you can't do it.
7	They can organize workshop that talks about how student can reduce stress and choosing the right path if they make any mistakes.
8	I could possibly talk to an intsructor or past graduate for advices
9	decrease the fee...more activities to help international student to join the local community
10	Holding more study sesssions and being more friendly to the students
11	there is nothing that uoft could be doing to help with this situation because i just need to learn to manage my time more wisely.
12	to provide more information of what will be on tests and more similar questions to what will be on the exam and only two hard questions.
13	Being as honest as an institution can of this size, letting the students feel like self-doubt is natural, and perfection is a worthy aim, but not to kill yourself over attempting to be perfect. The pressure to perform is quite staggering, and I feel it limits genuine critical attitudes because we're too afraid to be authentic. I would like to see mental health support be less constrained, it's like they're trying to kick you out before you sit down, so I'm not going back. I also think it's ridiculous that there's no support for recreational drug use.
14	Provide services to help students out like more 1 on 1 tutoring.
15	Coordinate the timing of assignments and test so that they are better interspersed especially towards the end of the semester.
16	I'm not really sure what UofT could do, I think it's more personal and specific to me.
17	Offering more resources to catch up for specific subjects since many high schools do not offer the same resources that many courses in many disciplines assume one may know.
18	I am not too sure. I know there are plenty of resources available, though.
19	It is more about self motivation, I don't think the college could be doing more to help.
20	the college could make more workshops on time management and effective ways to study for different learners.
21	Have more time options for every class and give allow every professor to give students about 10 minutes after class to discuss and ask questions. Professors usually run off right when class ends and then most students have to attend their next classes.
22	the college doesn't have to do much more to help. Its really up to me.
23	Residence is too expensive, and [financial aid] doesn't support me in moving out, my mom is very anti social, and picks a fight that last all night almost every night, I'm sleeping 3 to 5 hours a day, I though about moving out, but I can't afford it.
24	Increase Prof's office hour to more than one hour a week
25	Nothing really, they provide all the services a student needs like counselling, guidance, academic advisor, academic success centre.

Notes: Sample is non-international first year economics students at the University of Toronto in 2016 who received less than sixty percent during their fall term and participated in a warm-up and follow-up survey (both with a grade requirement). See text for more details.

Table A3: End-of-Term Random Sample Responses from Low-Achieving First-Year Students to the Question: "What Are You Thinking of Trying Differently to Help (Yourself)"

1	Trying to manage my time more efficiently.
2	I am making sure that I stay organized throughout the whole semester and making sure that I manage my time well.
3	focus me on study and trying to understand what i am looking towards to
4	I am thinking of asking to do less hours at work, so I can spend more time doing school work.
5	I am thinking of studying more often on a daily basis and studying more in advance for my tests and assignments
6	Add an activity (work, volunteer, sport) to feel more organized. Having a busy schedule makes me realize the importance of time management. Extra curricular activity also, helps in distracting from daily school stress.
7	Trying to study and understand the concepts more
8	being more motivated and seeking help right away, instead of waiting and deciding to catch up later
9	Managing my time a little better, and reviewing lecture notes the day of so that I'm not cramming right before an exam.
10	Make myself a schedule, and try my best to follow the schedule.
11	I'm trying to figure out a way to make learning fun for myself again.
12	I can advise students to help them as well as participate in certain groups and competitions to Improve my network as well as bring in more practical work.
13	Going to academic advising and staying at home/library studying everyday
14	I've bought an alarm clock to prevent oversleeping and will keep track of events and tests through a calendar and a stronger time management system.
15	to work harder and focus more on school rather than work.
16	to cut time from work and spend more time studying
17	try to understand certain basic principles, and spent more time to have an effective study plan
18	I will be studying much more often than I did last semester and I will be hiring a tutor to help me further my understanding of some of the curriculum.
19	sometimes i would concern if i am asking a 'dumb question', then i would rather deal with it on my own, other than that i would usually ask a friend or try research online.
20	i have no ideas.
21	The way I take and review notes and no matter what I have I will sleep at 12 and wake up 7AM to do them the next day NOT STAYING UP UNTIL 4AM ANYMORE.
22	Make notes
23	Trying to meet tutor more as possible.
24	I am planning to study more
25	I should work more efficient.

Notes: Sample is non-international first year economics students at the University of Toronto in 2016 who received less than sixty percent during their fall term and participated in a warm-up and follow-up survey (both with a grade requirement). See text for more details.

Table A4: Random Sample of Low-Achieving First-Year Students Initially Planning < 15 Hrs/Wk of Study Responding to the Question, "How and Why [Did] You Decide on this Number?"

1	I always want to join our school's basketball team. I want to spend more time training myself.
2	I believe that studying is very important but one should spend time in extra curricular activities also.
3	i thought that 1-2hours a day would be a good amount
4	As it is spread out evenly and is not to long that I get bored.
5	I thought that 8 hours would be a relatively reasonable number because I couldn't think of any ways to fit in 20 hours of study time in a week, but when I stop to consider it, it's entirely possible to do it most weeks, without sacrificing too time for my hobbies.
6	I will study more if I need to.
7	Since I have a lot of courses that are difficult I am aim for minimum 9 hours a week. Depending if I have a test in my other courses I would aim to focus on that course more than the others.
8	I believe this time is not too much and also not little for me, it is good and enough.
9	12 hours a week equates to 2 hours of studying time per class outside of course hours. Between this and resume building side projects I feel as though I have balanced my time fairly evenly as some of this skills I will be working on outside of that 12 hours are applicable to my courses.
10	I would like to study around 7 hours a week total for every subject that I am taking. One factor that greatly determines the amount of study time I will have available is [competitive sports]
11	Since I passed high school studying only 8 hours a week it should be the same for university.
12	I believe this time is not too much and also not little for me, it is good and enough.
13	I am used to this number since high school. sometimes it is enough to get decent grades, and sometimes not.
14	Because I have got 5 courses this semester, and if I study each for 3 hours, that is 15 hours a week. I finish my classes at about 4pm every day. In this case I think 15 hours is a fair amount.
15	I decided on the original study hours because my commute every to university can take 2 hours or more than that which leaves me very sleepy and tired.
16	I decided on my original study hours target by adding an additional 8 hours in comparison to my high school study hours.
17	15 hours per week, in order to make some change from high school, a well-achieved plan is necessary as well as enough study time
18	With high school experience 1-2 hour per day is enough.
19	First of all, this is the first year of my university life, there will be lots of different than the high school life, It will take a while to adapt to the new life. Therefore I decided to spend 10 hours per week to study, and I can use some time to meet the new friend and care about my own life. Once I used to the university life and have a good friend cycle I could spend more attention on the study. Second, the first semester is not that hard compare to the following years, so I think 10 hours is enough for the first few weeks' studies. I will increase the studying time as I learned more knowledge
20	I decided my original study goal based on my high school study experience.
21	I decided on 8 hours as the amount that I would be studying this year on any factors such as work, family friends and school (classes, tutorials). Now that I'm thinking about it 8 hours does not seem enough but the material is learned in class, therefore if you understand the concept, it should take to long to study.
22	I decided on my original study hours because I think I need to spend time on other things and not just study. I need time to go to the gym, join in clubs, go shopping and chat with my friends. If I take a lot of time on studying, I will get more stress and bad mood. Thus, I choose to study 9 hours a week.
23	It depends on the course and the level of difficulty for me. If the Course is fairly easy to understand I would put in lesser hours but if the course is difficult I would put in more and would try to make myself understand the content as much as I can.
24	Firstly, 5 hours seems as an average hours a week outside of midterm and exam period. I know myself that I am not a person who have enough concentration that can study in long hours. Therefore, 5 hours seems like a suitable time for myself. In my opinion, study time have to be suitable for each student instead of following others to study long time which may gain more disadvantage. Long hours study time like 10 hours per day is not the right study time for everyone. However, there is also a exception when there is a exam or assignment that need more time to study or review. I will considered to add some hours up to 5.
25	I am used to this number since high school. sometimes it is enough to get decent grades, and sometimes not.

Notes: Sample is non-international first year economics students at the University of Toronto in 2018 who received less than a sixty percent grade average during their fall term and participated in a warm-up survey. The full question is, "Before asking whether you might reconsider this amount, we'd like to better understand how and why you decided on this number. Is it because you did not expect to gain much from studying more, or because you did not think you would have enough time, or some other factor? Please share your thoughts in a paragraph or two". See text for more details.