

College-Going Culture and College Readiness Outcomes: Are
Early College High Schools Bridging the Gap?

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Abstract

In this study, I used campus performance data published by the Texas Education Agency, high school and school district websites, and an independently designed College-Going Culture Index to evaluate the relationship between college-going culture (CGC) and college readiness outcomes, namely average total SAT scores and rates of enrollment in Texas institutions of higher education (IHEs). Additionally, I focused on early college (EC) high schools as one model of a high CGC school and investigated whether EC high schools demonstrated better college readiness outcomes than non-EC high schools, particularly for student populations generally underrepresented in college, such as African American, Hispanic, and economically disadvantaged students. I found that there is no discernable relationship between college-going culture or EC high school status and average SAT scores, a measure of key cognitive strategies and content knowledge. However, strong college-going culture is moderately positively correlated with enrollment in Texas IHEs, and EC high school students enroll in Texas IHEs at significantly higher rates than non-EC high school peers. This relationship was particularly strong for economically disadvantaged students. The results suggest that the EC high school model helps students to be more ready for college in the dimension of transition knowledge and skills. The more pronounced gaps in outcomes for economically disadvantaged students indicate that EC high schools also help students to overcome certain economic barriers to college entrance.

Keywords: college-going culture, early college high school, college readiness, achievement gap

Introduction & Literature Review

The College Enrollment/Completion Gap

College degree attainment continues to be a major area of educational inequity. According to the U.S. Population Bureau's 2015 Current Population Survey, non-Hispanic Whites earn a bachelor's degree or higher 1.6 times more frequently than Black Americans and 2.3 times more frequently than Hispanic Americans (Ryan & Bauman, 2016). College degree attainment differs by economic status; approximately half as many students of low socioeconomic status earned a bachelor's degree or higher compared to middle SES students (National Center for Education Statistics, 2015), and parental wealth has been shown to effect college enrollment (Conley, 2001).

In 2017, the Bureau of Labor Statistics reported that Americans 25 and older holding a bachelor's degree have median weekly earnings 1.4 times greater than those holding an associate degree and 1.6 times greater than those who only possess a high school diploma (Torpey, 2018). Additionally, bachelor's degree holders experienced lower unemployment rates than associate degree holders and high school graduates (Torpey, 2018). The impact of degree attainment on earning potential and employment security implicates inequity in college education as a continuing contributor to the racial wealth gap (Aliprantis & Carroll, 2019).

College-Going Culture

College-going culture, sometimes also called college culture, is a term that describes the combination of school and community policies, programs and attitudes that build the "expectation of postsecondary education for all students—not just the best students" (The

College Board, 2006), or “a school culture that encourages all students to consider college as an option after high school and prepares all students to make informed decisions about available post-secondary options” (McClafferty, McDonough & Nunez, 2002). Schools that possess college-going culture “behave as if [they] expect all students to achieve at a high level, actively work to remove barriers from learning, and teach students and families how to help themselves” (The College Board, 2006). Schools that have strong college-going culture prioritize academic rigor in curriculum, make connections with local postsecondary institutions, continuously educate students on the college planning process, provide comprehensive support services throughout the planning process, and keep college readiness central to the school’s mission (McClafferty et al., 2002; Corwin & Tierney, 2007). College-going culture has been shown to be correlated with high college admission and enrollment (Athanases, Achinstein, Curry & Ogawa, 2016), and students attending high CGC schools are more likely to apply to 4-year colleges (Robinson & Roksa, 2016). However, this does not necessarily ensure that students are sufficiently academically prepared for success in college (Athanases et al., 2016). This disparity between college enrollment and college achievement can be especially pronounced for minority students and low-income students participating in programs associated with high college-going culture, such as dual credit partnerships. Students of color and low-income students participating dual enrollment may enter college at high rates but still experience significant gaps in college completion (Taylor, 2015).

Early College High Schools

Early college (EC) high schools are defined by the Texas Education Agency as high schools which focus on enrolling students who are traditionally less likely to attend college and provide them the opportunity to graduate with both a high school diploma and up to 60 college

credits (Early College High School, 2019). According to Edmunds et al., EC high schools are “a comprehensive model of schooling explicitly focused on college readiness for all” (2017), making EC high schools an excellent model for a school possessing high college-going culture. In fact, in a study of EC high schools in North Carolina, Haxton et al. found that attending an EC high school had a modest positive effect on a school’s college-going culture, with an effect size of 0.32, as assessed by a three-question student survey (2016).

Early college high schools have been shown to have a variety of positive effects on student outcomes. Students who graduate from EC high schools accumulate far more transferable college credits than non-EC peers (Edmunds et al., 2017), and attending an EC high school has been shown in one randomized longitudinal study of North Carolina schools to have positive impacts on college enrollment after high school, with early college students enrolling at rates approximately 10 percentage points higher than non-early college peers (Haxton et al., 2016).

However, in one of the few studies on early college high schools from which we can draw causal conclusions, graduates of North Carolina EC high schools were found to enroll in postsecondary education at rates similar to their non-EC peers in the two years following high school (Edmunds et al., 2017). Additionally, only 16% of EC high school students in the study graduated with a completed associates degree, indicating that most students are not transitioning directly into the workforce either, at least not into any field requiring higher education or training (Edmunds et al., 2017). Even within Haxton et al.’s more optimistic findings regarding North Carolina EC high schools, the probability of students enrolling in a 4-year college in the first year after high school was not significantly different between EC high school students and control students, and early college students only made modest, though statistically significant,

gains on their non-early college peers in second year post-high school enrollments (Haxton et al., 2017). These findings agree with studies of other dual-enrollment high school programs which find that while the likelihood of attending any college increases, this relationship does not hold for 4-year college enrollment (Cowan & Goldhaber, 2015). Therefore, while EC high schools have been shown definitively to increase students' access to college during high school, there are still questions of how effective these schools are in bridging actual college enrollment gaps post-graduation for minority and low-income students.

The descriptive literature on EC high schools have found that faculty and students in EC high schools have a variety of positive experiences and challenges. Various exploratory, often interview and survey-based, studies have found that EC high schools have school cultures that emphasize and foster college readiness and academic achievement (Beall, 2016; Brenner, 2012) and that students experience a supportive environment with structural supports and nurturing teachers and staff (Ari et al., 2017; Beall, 2016; Brenner, 2012). However, one narrative study on EC high schools found that the blending of college life with high school life resulted in reduced supervision and increased independence, sometimes to students' detriment, leading to behaviors like substance abuse during school hours (Woodcock & Beal, 2013). Another narrative study found that students entering EC high schools may underestimate the rigor of such a school and face unexpected academic challenges (Shelton, 2013). Yet another narrative study found that although the notion that EC high schools foster strong and supportive student relationships is generally true, there can be distinct cultural divisions between minority students and non-minority teachers. Teachers may approach minority students from deficit perspectives; attributing students' academic challenges to their race or cultural background, and disrespect cultural differences (Locke, Maxwell & Tello, 2017).

College Readiness

Conley defines college readiness as being able to “qualify for and succeed in entry-level, credit-bearing college courses leading to baccalaureate or certificate... without the need for remedial or developmental coursework” (2012). College readiness, per Conley’s conception, has four key dimensions: key cognitive strategies, key content knowledge, key transition knowledge and skills, and key learning skills and techniques (2007; 2012). Therefore, for a complete portrait of student college readiness, multiple metrics need to be used which can account for multiple dimensions of readiness. SAT scores, for instance, can be interpreted as a measure of key content knowledge and key cognitive strategies, but would not provide evidence for transition knowledge and skills or learning skills and techniques. College readiness has been implicated as an important factor in existing college enrollment and achievement gaps. Minority and low-income students who demonstrate greater college readiness on ACT benchmarks have narrower college enrollment gaps and college achievement gaps than less college-ready peers (ACT Inc., 2010). Additionally, interventions targeting incoming first-generation college freshmen which discuss transition knowledge and skills and learning skills and techniques have been shown to significantly improve student GPA and psychosocial adjustment to college (Stephens, Hamadani & Destin, 2014). Yet, in Texas, college readiness gaps persist between minority students and White students (Barnes & Slate, 2014).

Research Questions

This inquiry seeks to answer two research questions:

- 1) Is there a relationship between college-going culture and college readiness outcomes?
- 2) Do early college high schools in Texas help student populations traditionally underrepresented in colleges to perform better on college readiness metrics?

Methodology

In order to assess a given school's degree of college-going culture, or CGC, I designed a CGC index. McClafferty et al. identify nine traits which contribute to a college-going culture (2002); the CGC Index items are aligned to four of these traits which are readily assessable through published school performance data and school websites. This index can be referenced in Appendix A. Data used to score high schools with the CGC index were obtained partially from the Texas Academic Performance (TAP) reports published by the Texas Education Agency (TEA) and partially from individual school websites.

Data for college readiness metrics such as average SAT scores and rate of enrollment in Texas Institutes of Higher Education (IHEs) was obtained from the TEA's TAP reports from 2017-2018 (2018). SAT data reflects the performance of the current class while higher education enrollment data reflects the performance of the most recently graduated class. As I was limited to publicly available data and the TEA only reports in-state higher education enrollment, this study does not account for students attending out-of-state schools. Future studies would benefit from looking at out-of-state enrollment in addition to in-state enrollment.

I selected EC high schools by numbering the schools listed on the TEA's official list of 2017-2018 designated early college high schools (2017) and then using a random number generator to select schools (Haahr, 2009). Some schools which were randomly selected were not used for analysis because data for EC high school students was not separated from data for the whole school; this is the case for large high schools that have an EC high school as an academy within the school. Schools which did not report certain data, such as SAT scores, or which had so few students that most performance data were masked for student privacy, were also not included in this study. Therefore, these results may not be generalizable to schools which have

EC high schools as a program within a larger public high school as opposed to independent EC high school campuses.

The selection of non-EC high schools was conducted using the same random number generator and the TEA's master file of high school SAT score data (2017b). Like the EC high school data, non-EC high schools which did not report SAT scores or whose data was largely masked due to small school size were not included in this study.

After the conclusion of data collection, data was analyzed. Relationships between CGC and college readiness metrics were evaluated through linear regression analysis. Differences between EC and non-EC high schools were evaluated using a Student's t-test and Hedges' G metric of effect size. All hypothesis testing was conducted using the T-Test Calculator and the Effect Size Calculator for T-Test from *Social Science Statistics* (2019).

Findings

This section summarizes the findings regarding the relationship between college-going culture and college readiness outcomes, as well as examines to what extent early college high schools bridge gaps in college readiness outcomes for African American, Hispanic, and economically disadvantaged students. Analysis is divided between SAT scores, which can be interpreted as a metric of key cognitive strategies and content knowledge in Conley's definition of college readiness (2012), and enrollment in Texas institutions of higher education, which can be interpreted as a metric of key transition knowledge and skills (Conley, 2012).

SAT Scores

College-going culture did not appear to have a significant impact on average SAT scores. The linear regression model for both EC high schools and non-EC high schools together

produced a line with an $r^2 = .0174$ (see Figure 1), indicating that a school's degree of CGC is not a good explanatory variable for average SAT scores.

FIGURE 1

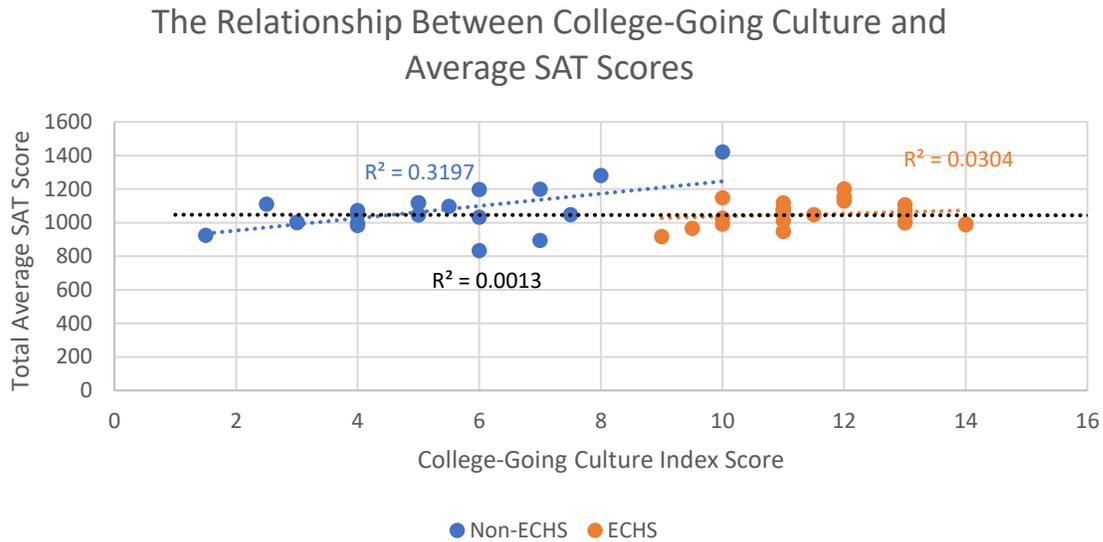


Figure 1: The relationship between college-going culture and average SAT scores. College-Going Culture Index scores are plotted against average SAT scores with linear regressions run for non-EC high schools, EC high schools, and both data sets together. The r^2 values of these regressions are .3197, .0304, and .0174, respectively.

Additionally, students at EC and non-EC high schools score very similarly on the SAT (see Table 1). The 20 non-EC high schools had a mean SAT score only 20.1 points higher than the 20 EC high schools; the difference between the groups was found to be non-significant ($P = .56$). When comparing only African American, Hispanic, or economically disadvantaged students, EC high schools attained slightly higher mean SAT scores, but all differences were found to be statistically non-significant ($P = .70$, $P = .92$, $P = .68$, respectively). The Hedges' G values calculated (see Table 1) do not reach the threshold value of 0.2 for EC high school status to be considered to have a small effect on SAT scores.

TABLE 1

SAT Performance of EC and Non-EC High Schools Broken Down by Demographic

	Non-ECHS	ECHS	Non-ECHS African American	ECHS African American	Non-ECHS Hispanic	ECHS Hispanic	Non-ECHS Economically Disadvantaged	ECHS Economically Disadvantaged
Sample Size (n)	20	20	12	8	17	20	16	20
Mean	1070.1	1050.2	1006.3	1030.3	1034.3	1037.7	1025.1	1040.4
Standard Deviation	134	74.6	155.3	91.8	133.2	58.6	150.6	70.2
Effect Size (Hedges' G)	--	0.18	--	0.18	--	0.03	--	0.14

Notes. ECHS stands for early college high school. *** indicates $p < .001$, ** indicates $p < .01$, * indicates $p < .05$.

Enrollment in Higher Education

A linear regression model was calculated for the relationship between CGC index scores and enrollment rates in Texas IHEs. Based on the r^2 value of .4053, CGC can explain approximately 40% of the variation in rates of enrollment in Texas IHEs. To ensure that this relationship was not exaggerated by the scoring bonus EC high schools receive on the CGC Index, a second more conservative model was created with all CGC scores for EC high schools adjusted to remove their bonus (see Figure 3). The moderate positive relationship between CGC and rate of enrollment in Texas IHEs still holds with an adjusted r^2 value of .3591.

FIGURE 2

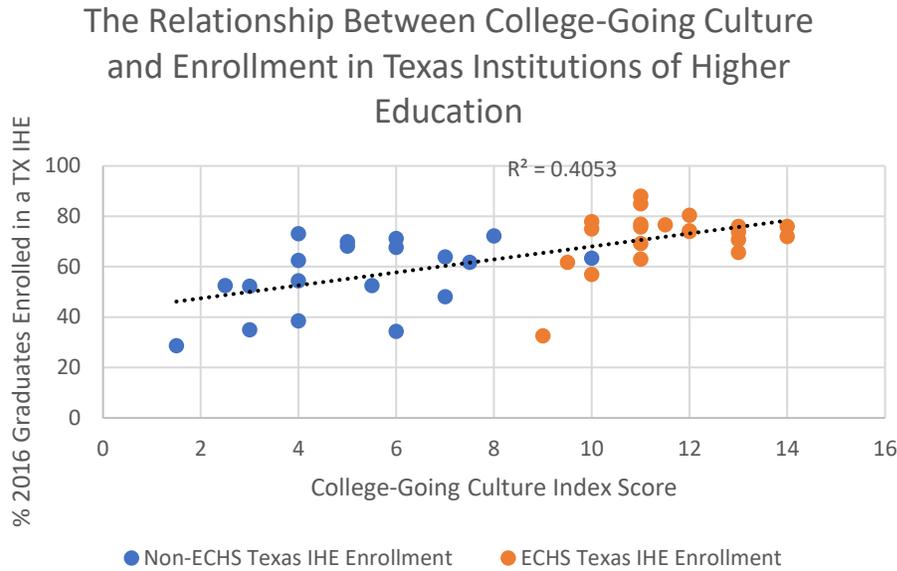


Figure 2: The relationship between College-Going Culture index scores and enrollment in Texas institutions of higher education. A linear regression shows an r^2 value of .4053, indicating a moderate strength positive correlation between college-going culture and rates of enrollment in Texas institutions of higher education.

FIGURE 3

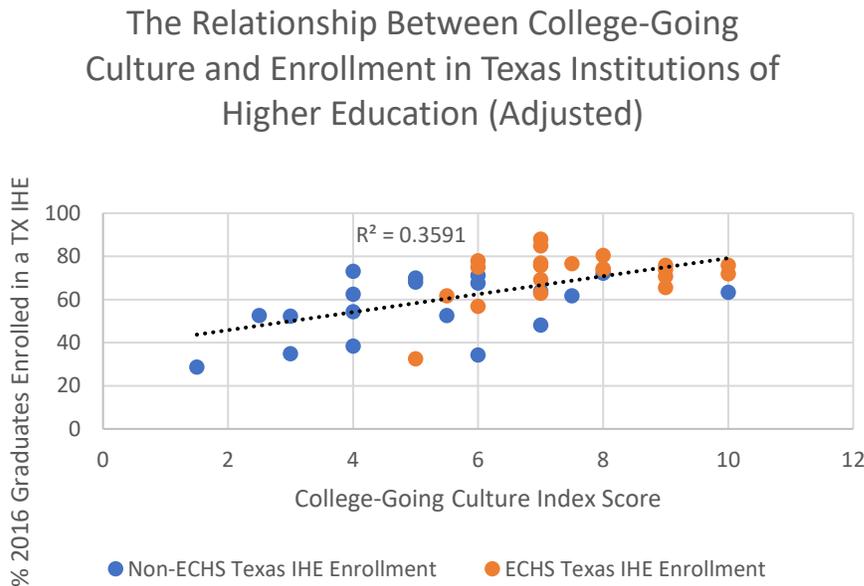


Figure 3: The relationship between College-Going Culture Index scores and enrollment in Texas institutions of higher education, adjusted so that EC high schools do not receive any additional points by virtue of EC high school status on the CGC index. A linear regression shows an r^2 value of .3591, verifying that the previously found moderate strength positive correlation between CGC and Texas IHE enrollment still holds up with more stringent CGC Index scoring.

One demographic group demonstrated strong positive correlation between CGC and Texas IHE enrollment: economically disadvantaged students. With an r^2 value of .571, approximately 57% of the variation in Texas IHE enrollment can be explained by CGC. When CGC scores for EC high schools are adjusted, the correlation persists with an r^2 value of .4936 (data not shown).

FIGURE 4

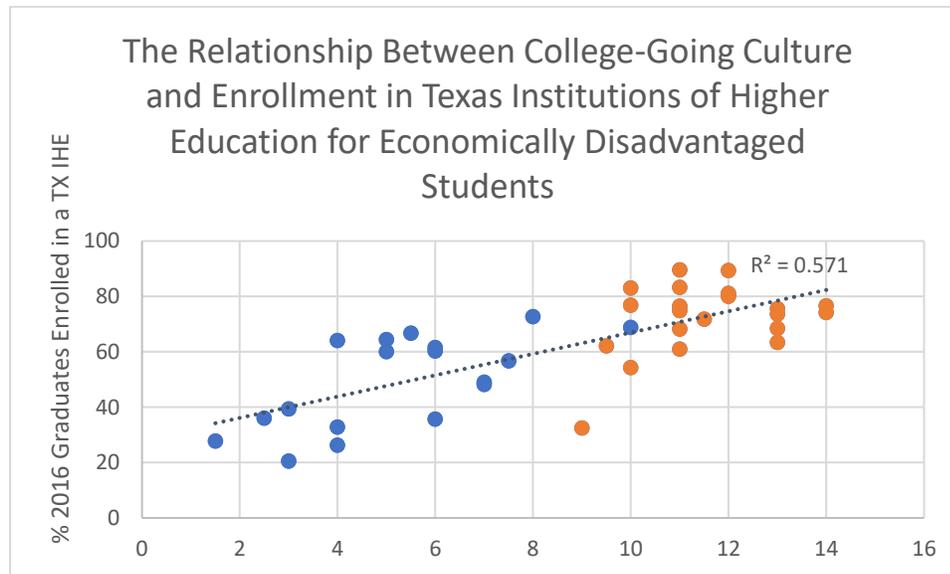


Figure 4: The relationship between College-Going Culture index scores and enrollment in Texas institutions of higher education for economically disadvantaged students. A linear regression shows an R-squared value of 0.571, indicating a strong positive correlation between CGC and Texas IHE enrollment.

Looking specifically at differences in enrollment between EC and non-EC high schools, EC high schools attained enrollment rates in Texas IHEs at a mean rate 15.2 percentage points higher than non-EC high schools, a difference which was found to be highly statistically significant (see Table 2). Differences for African American, Hispanic, and economically disadvantaged students ($P = .01$, $P = .007$, $P < .001$, respectively) were also found to be statistically significant, with EC schools out-enrolling non-EC schools by 23.6 percentage points for African American students, 14.1 percentage points for Hispanic students, and 22.7 percentage points for economically disadvantaged students. Effect sizes across demographics were well above the threshold value of 0.8 for EC high school status to be considered as having a large effect on Texas IHE enrollment.

TABLE 2

Texas IHE Enrollment of EC and Non-EC High Schools Broken Down by Demographic

	Non-ECHS	ECHS	Non-ECHS African American	ECHS African American	Non-ECHS Hispanic	ECHS Hispanic	Non-ECHS Economically Disadvantaged	ECHS Economically Disadvantaged
Sample Size (n)	19	20	12	7	19	20	18	20
Mean	56.3%	71.5%***	53.7%	77.3%*	56.2%	70.3%**	49.5%	72.2%***
Standard Deviation	14%	11.5%	18%	16.3%	16.5%	14.6%	16.6%	12.8%
Effect Size (Hedges' G)	--	1.19	--	1.35	--	0.91	--	1.54

Notes. ECHS stands for early college high school. *** indicates $p < .001$, ** indicates $p < .01$, * indicates $p < .05$.

Discussion

I found several major trends regarding college-going culture and college readiness outcomes based on my data analysis. Firstly, college-going culture does not appear to be related to traditional metrics of college readiness like SAT scores. Secondly, possessing strong college-going culture is positively correlated with actual college enrollment, at least within Texas institutions. Thirdly, while the early college high school model does not appear to yield any better or worse outcomes on standardized college entrance tests, like the SAT, students who attend EC high schools are significantly more likely to attend a higher education institution in Texas than their non-EC high school peers.

Based on the data presented in this study, strong college-going culture likely does not impact students' college readiness in terms of key content knowledge or cognitive skills. However, CGC is positively correlated with college enrollment, indicating that high CGC schools could impact key transition knowledge and skills. High CGC schools, particularly EC high schools, appear to provide students the social and material supports necessary to successfully apply to and enroll in college. This hypothesis is supported by the particularly pronounced correlation between CGC and college enrollment among economically disadvantaged students. In EC high schools, where students have the opportunity to earn an associate degree by graduation, the financial burden of obtaining a bachelor's degree can be reduced. In practice, with actual student dual-credit completion and university transfer credit policies, this may only eliminate one or two semester's worth of credit hours, but even this is a significant barrier reduction.

The college credit earned for free during high school is only part of the picture regarding student supports in EC high schools. EC high schools often implement broad access to tutoring, create peer-based learning communities, explicitly teach key learning skills and techniques through enrollment in programs like AVID, and offer summer bridge programs (Nodine, 2011).

It is, of course, important to recognize the limitations of this study when drawing conclusions from it. One major limitation is that enrollment data is limited to Texas institutions of higher education, and so rates of enrollment in out-of-state schools cannot be compared. Therefore, there may be instances in the data where a school's enrollment numbers appear depressed because a sizable proportion of the school's graduates attend out-of-state institutions. Additionally, "institutions of higher education" is a category which does not discriminate between two-year, four-year, and technical educational institutions. This limitation means that

enrollment in traditional four-year colleges and universities cannot be directly compared between EC high schools and non-EC high schools. Furthermore, while correlational data is useful for establishing patterns and possible relationships between variables, no causal conclusions can be drawn from this study.

Conclusion

This comparative study of early college and non-early college high schools suggests that college-going culture is not related to certain college readiness dimensions, namely key content knowledge and key cognitive skills. However, CGC is positively correlated with enrollment in Texas institutions of higher education, and this relationship suggests that CGC could play a role in helping students build key transition knowledge and skills, such as understanding how to apply to colleges or complete the FAFSA. Early college high schools demonstrated significantly higher rates of enrollment in Texas IHEs than non-early college high schools. Rates were higher for whole school populations, African American students, Hispanic students, and economically disadvantaged students, the latter of whom experienced the greatest gains in college enrollment when comparing EC high schools to non-EC high schools.

EC high schools appear to be a powerful tool for bridging the achievement gap in vulnerable populations such as African American, Hispanic, and economically disadvantaged students when it comes to pursuing a college education. Additional studies will be needed to determine what kinds of institutions Texas EC high school graduates are enrolling in compared to their non-EC high school peers and how likely they are to successfully obtain the degrees they pursue. Furthermore, to really understand the dynamics of EC high schools in Texas, EC high school programs that are opened as sub-academies of larger public high schools need to have

performance data tracked separately from the school as a whole and made publicly available, as the learning environment and outcomes for these types of programs may differ from independent EC high schools or those located on college campuses.

Additionally, while the EC high school model may help bridge the achievement gap, many elements of the EC high school model are not feasible for adoption by the average public high school. Capping cohort sizes at 100 students, for example, or providing extensive dual-credit courses at no cost to the student are unrealistic, if not impossible, goals for the average high school. However, the success of EC high schools in getting students enrolled in college, particularly those students most at risk of not attending, indicates that there is great potential value in investing school resources in helping students and families through the logistics of applying to college and in subsidizing the cost of dual-credit and AP courses for economically disadvantaged students.

The findings of this study demonstrate that “at-risk” students can get into college if given the necessary supports. This evidence challenges the appropriateness of encouraging at-risk students to participate in career and technical education and pursue trades, something which has long been touted as a drop-out intervention, but which in practice yields somewhat meager results (Brown, 2000; Gottfried & Plasman, 2017). While student participation in CTE programs has not been very well characterized, research suggests that CTE students are lower-income, receive lower grades, perform worse on standardized tests, and have less traditional and potentially less stable family arrangements (Bierlein Palmer & Gaunt, 2007; Bae, Gray & Yeager, 2007). These demographics indicate that students already at risk of not attending college are entering career and technical pathways, which may limit their college options later. CTE participation does not correlate with college-going behaviors like applying to or enrolling in

college (Gottfried & Plasman, 2007). CTE participation also does little to help students achieve academically and can interrupt academic progression in key areas like math course completion (Bae, Gray, & Yeager, 2007). In one study of career and technical education influence on drop-out risk, students' belief that they would attend any amount of college was just as influential on drop-out as participation in CTE courses (Gottfried & Plasman, 2017). Students' belief that they would complete a four-year degree, or more, was nearly three times as influential as CTE participation on the probability of dropping out (Gottfried & Plasman). These results indicate that having a strong college-going culture may be a more effective tool for helping at risk students than participation in career and technical education. The fact remains that a strong college-going culture helps all students to understand the array of postsecondary options available to them, including trade and technical schooling, and to be well qualified for any postsecondary path. A college-going culture challenges the persistent barriers to social mobility that minority and economically disadvantaged students experience, while CTE appears to reinforce them, aiming only to prevent the most catastrophic of educational outcomes.

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Appendix A

The College Going Culture Index

Alignment Trait	College Going Culture Index Item					
College Partnerships	Is the school an early college high school?					
		Yes +4	No +0			
Testing and Curriculum	Does the school have an IB program?					
		Yes +3	No +0			
Testing and Curriculum	Does the school offer AP classes?					
		Yes+1	No +0			
Testing and Curriculum	What percentage of students take AP/IB courses?					
		75% or more +3	50-75% +2	25-50% +1	10-25% +0.5	0-10% +0
College Partnerships Testing and Curriculum	Does the school offer dual credit classes?					
		Yes +1	No +0			
College Partnerships Testing and Curriculum	What percentage of students complete dual credit courses?					
		75% or more +3	50-75% +2	25-50% +1	10-25% +0.5	0-10% +0
Testing and Curriculum	Do 75% or more of students take the SAT?					
		Yes +1	No +0			
Clear Expectations	Does the school's mission statement or other description specifically mention college readiness?					
		Yes +1	No +0			
Information and Resources	Does the school website advertise college resources, either available online or in person?					
		Yes +1	No +0			