



BUILDING STUDENT MOMENTUM FROM HIGH SCHOOL INTO COLLEGE

By Elisabeth Barnett, Community College Research Center
Ready or Not: It's Time to Rethink the 12th Grade
Jobs for the Future | February 2016



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ABOUT THE AUTHOR

Elisabeth Barnett is a senior research associate for the Community College Research Center at Teachers College, Columbia University. She is a project lead for the Center for Analysis of Postsecondary Readiness study on alternative placement systems and student outcomes. She also leads the CCRC project “Reshaping the College Transition: A Study of Early Assessment and Curricular Interventions.”

Barnett has led research on the high-school-to-college transition, college readiness, dual enrollment, developmental education, early college high schools, the Common Core State Standards, and career and technical education practices. Her publications include *Reshaping the College Transition: Early College Readiness Assessments and Transition Curricula in Four States* and *Dual Enrollment: A Strategy for Educational Advancement of All Students*.

Barnett is also associate director of the National Center for Restructuring Education, Schools and Teaching at Teachers College.

Barnett received her PhD from the University of Illinois at Urbana-Champaign in educational organization and leadership-higher education.

ACKNOWLEDGMENTS

JFF is grateful for the support of the Bill & Melinda Gates Foundation, which enabled us to convene the innovative policymakers and practitioners from around the country who informed the *Ready or Not: It's Time to Rethink the 12th Grade* series of papers. The author thanks Joel Vargas and his colleagues at JFF for their intellectual partnership in this endeavor. It was also wonderful to have the opportunity to interact with the many dedicated scholars and practitioners who provided input for this report and the entire series. Finally, thanks are due to friends and fellow researchers at the Community College Research Center and National Center for Restructuring Education, Schools and Teaching, Teachers College, Columbia University, who have done much to improve student experiences and outcomes in college.

TABLE OF CONTENTS

| | |
|--|-----------|
| INTRODUCTION | 1 |
| CREATING A STUDENT MOMENTUM FRAMEWORK | 3 |
| ACADEMIC KNOWLEDGE AND SKILLS | 5 |
| NONCOGNITIVE SKILLS | 9 |
| COLLEGE CULTURAL CAPITAL | 12 |
| CO-CREATING MOMENTUM CHAINS IN PRACTICE | 15 |
| DEVELOPING A SYSTEM OF SHARED RESPONSIBILITY FOR STUDENT MOMENTUM | 17 |
| CONCLUSION | 19 |
| APPENDIX | 20 |
| ENDNOTES | 21 |
| REFERENCES | 22 |

INTRODUCTION

Recent research has increased our understanding of what high school students need to know and be able to do to successfully enroll in and complete college. Yet this knowledge has not led to widespread change in student preparation, and far too few seniors graduate college-ready. As a result, our nation faces high rates of remediation, low rates of college completion, and a large number of people without a postsecondary credential struggling to find living-wage work.

This report proposes a new dimension to our understanding of how best to prepare high school students for higher education. We suggest considering the accumulation of momentum points—specific college preparatory *experiences* and markers of educational *attainment* in high school—that together provide graduates with a greater likelihood of college success. We de-emphasize any single experience or attainment in favor of multiple experiences and attainments that iteratively contribute to students’ academic momentum. Together, these critical points can form a “momentum chain”¹—that is, a path by which students move with increased forward motion toward college readiness. They may be particularly helpful to low-income and first-generation college students, who are disproportionately underprepared. We propose that students who have the opportunity and supports to accumulate these momentum points are more likely to avoid remediation, persist in college, and graduate with a credential of value within a reasonable amount of time.

In choosing the momentum points, we emphasize experiences and attainments that are: (1) supported by research evidence, and (2) made possible through collaborative work between high schools and colleges. This paper is one of a series of five reports intended to encourage K-12 and higher education systems to take joint responsibility for student success in the “shared transition zone” of 12th grade and the first year of college. In this series, we propose that secondary and postsecondary

institutions collaborate in key ways—specifically, they could *co-design*, *co-deliver*, and *co-validate* a set of strategies that improve all students' chances of succeeding in college. Such co-created strategies have the potential to be more effective than those developed by one sector alone. Further, they can reduce system misalignment, caused by differing standards, curricula, and assessments, that impedes smooth transitions from high school to college.

Thus, while this paper focuses on the high school senior year, and while many of the actions proposed would be *delivered* primarily by high schools, or by high schools and colleges separately, they would be created collaboratively. The plans would be *co-designed* by secondary and postsecondary institutions, and both sectors would evaluate and *co-validate* the results.

Ideally, the two sectors would also implement strategies for improving certain features of the first year of college. This would maintain student momentum built in high school and enable students who do not have the high school opportunities outlined here to gain momentum early in their college experience. A key benchmark of success, as identified in the first paper of this series, could be the completion of at least one credit-bearing, college-level course in a program of study by the end of freshman year.

Strategies to help students achieve this interim goal in college and continue their success deserve exploration; however, they are outside the purview of this paper.

The first section of this paper describes momentum points and momentum chains in more detail and outlines a student momentum framework based on three research-based components of college readiness. The three sections that follow discuss the research base related to each component and ways that high schools and colleges can work both separately and together to promote smoother cross-institutional transitions. The paper then explores some of the practical considerations of co-creating momentum chains in practice, including aspects of co-design, co-delivery, and co-validation. The paper concludes with conditions that could support the development of a system of shared responsibility for building student momentum from high school into college.

Together, these critical points can form a “momentum chain”—that is, a path by which students move with increased forward motion toward college readiness.

CREATING A STUDENT MOMENTUM FRAMEWORK

“Momentum” can be defined as “strength or force gained by motion or by a series of events.”² Building on the work of other scholars (e.g., Adelman 2006; Leinbach & Jenkins 2008), we use the term to refer to the accumulation of experiences and attainments that make postsecondary success more likely. In the context of this paper, experiences involve activities that students engage in that are provided by educational institutions. By attainments, we mean indications of educational accomplishment, such as accruing credits or passing an exam.

We recognize that these momentum chains are aspirational. Our intent is not to propose new hurdles that students must climb over on the way to college enrollment. Rather, our goal is to strengthen opportunities for students to gain multiple experiences and attainments that contribute to their momentum and propel them to and through their first year of college.

In discussing momentum points and momentum chains, we use a three-part framework that draws on the work of other scholars, including David Conley’s “Four Keys to College and Career Readiness” model (2012) and the “College Readiness Indicator Systems” initiative (Gurantz & Borsato 2012).³ Ideally, students would move toward college readiness in all three dimensions:

- **Academic knowledge and skills**, including content knowledge and academic skills such as critical thinking, writing, and argumentation;
- **Noncognitive skills**, including affective dispositions and nonacademic skills such as time management, perseverance, and goal setting; and

➤ **College cultural capital**, including the knowledge, tools, and assets required to navigate the transition to college.

In the following sections, we present the research base for momentum points related to each of the three dimensions of college readiness and then discuss possibilities for high schools and colleges to collaborate to provide opportunities for these experiences and attainments.

EXPERIENCES AND ATTAINMENTS THAT PROVIDE MOMENTUM

| MOMENTUM POINTS | | EXPERIENCE OR ATTAINMENT? |
|--------------------------------------|--|---------------------------|
| Academic Knowledge and Skills | Participating in a rigorous core curriculum in high school | Experience |
| | Taking college-level courses (i.e., dual enrollment, AP, and/or IB) in high school | Experience |
| | Math and English foundational knowledge at the level required for placement in college-level, credit-bearing courses | Attainment |
| | Earning a good high school GPA | Attainment |
| | Accruing six college credits during high school | Attainment |
| Noncognitive Skills | Opportunities to establish personal goals and life direction | Experience |
| | Opportunities to develop and strengthen a range of noncognitive skills predictive of college success | Experience |
| | Good attendance | Attainment |
| | Showing readiness on a noncognitive assessment | Attainment |
| College Cultural Capital | Exposure to college norms and expectations | Experience |
| | Validation by high school and college faculty | Experience |
| | Completing one or more college applications and the FAFSA | Attainment |
| | Commitment (submission of paperwork) to attend a college in the fall following graduation | Attainment |

ACADEMIC KNOWLEDGE AND SKILLS

Students need to acquire core academic knowledge and skills in order to be college ready and to experience college success. This is traditionally considered the predominant factor predicting future academic performance (Camara & Echternacht 2000; DeBerard, Spielmans, & Julka 2004), though it is not the sole factor. Core knowledge and skills include grasping key content and engaging in critical thinking, writing, and argumentation. We propose that the following academic experiences and attainments in high school contribute to college readiness and success:

EXPERIENCE: PARTICIPATING IN A RIGOROUS CORE CURRICULUM IN HIGH SCHOOL

Research base

Adelman's (2006) often-cited research found that the academic intensity of students' high school coursework was the most important factor in their momentum toward a Bachelor's degree. "Academic intensity" refers to participation in a substantial number of challenging high school courses. The highest level of math is particularly important, with courses above Algebra II (Pre-calculus/Trigonometry, Calculus) considered to be "tipping points" in predicting student success in college.

Similarly, ACT, known widely for its college admissions test, has done research for a number of years on the courses students need to become college ready. The studies have compared high school students who completed a rigorous core of college-preparatory courses⁴ with peers who did not do so. Students who completed the college-

preparatory core courses were 12 percent more likely to enroll in college, 9 percent more likely to achieve a first-year college grade point average (GPA) of 3.0 or higher, and 8 percent more likely to earn a college degree (ACT, Inc. 2007).

Research indicates that students generally benefit from taking challenging courses, even when they have not performed well academically in the past.

taking the ACT in 2014, about 73 percent reported that they had taken all of the courses in the ACT-recommended core curriculum (ACT, Inc. 2014). High schools should ensure that they offer courses that students need in order to be well prepared for college—and that they are available to all students who could benefit from taking them. Research indicates that students generally benefit from taking challenging courses, even when they have not performed well academically in the past (Boroch & Hope 2009).

High school and college collaborative work

Colleges can play a key role in informing schools, students, and parents about the importance of taking rigorous courses in high school. In these conversations, they can emphasize the advantages of fully utilizing the senior year to take advanced, college-preparatory courses (Boroch & Hope 2009). In addition, college and high school faculty can analyze the alignment between courses offered in the senior year and in the first year of college. As a part of this analysis process, colleges can provide feedback to high schools on how to make sure that courses provide high-quality preparation for college.

EXPERIENCE: TAKING COLLEGE-LEVEL COURSES WHILE IN HIGH SCHOOL

Research base

Participation in college-level courses in high school can serve as an on-ramp to postsecondary success, especially for traditionally underserved students. Dual enrollment

High school role

Not all high schools offer a full complement of rigorous college-preparatory courses, and student access to these courses is uneven even when they are available (Adelman 2006). Of students

programs allow students to take actual college courses while still in high school, sometimes for both high school and college credit. Karp and colleagues (2008) found that Florida students who participated in dual enrollment were more likely to graduate from high school and enroll in college than similar students who did not participate. In addition, dual enrollment participants were more likely to persist in college, earned an average of 15 more college credits 3 years after high school graduation than nonparticipants, and had significantly higher college GPAs. Similar results were found for New York City dual enrollment students (Karp et al. 2008). A study conducted in Texas also found substantially better college outcomes for students who took dual enrollment courses (Struhl & Vargas 2012).

The research support for participation in Advanced Placement (AP) and International Baccalaureate (IB) courses is less robust. Both programs offer rigorous courses that include opportunities to demonstrate mastery on final exams, often resulting in the award of college credit. They also position students well for admission to selective colleges (Hertberg-Davis, Callahan, & Kyburg 2006). However, a number of studies (Dougherty, Mellor, & Jian 2005; Geiser & Santelices 2004; Klopfenstein & Thomas 2009) found little to no predictive value on subsequent performance in college of engaging in AP coursework, although good performance on AP exams was associated with positive outcomes in college (Geiser & Santelices 2004). One study showed that students who enrolled in IB programs went on to earn higher GPAs in college (Geiser & Santileces 2004).

High school role

High schools can make sure that students have opportunities to take college-level courses while in high school. Based on school and student preferences and consideration of the relevant research, educators can decide whether these should be dual enrollment, AP, or IB courses. In the case of dual enrollment, educators must determine whether to offer courses at the high school or at the college. Research suggests that students experience greater benefits from courses offered on the college campus (Speroni 2011). High schools should make special efforts to offer dual enrollment opportunities to students who are less academically advanced. High schools can do so by:

1. Providing extra assistance so that students can become eligible for dual enrollment courses;

2. Offering dual enrollment courses that have lower eligibility requirements; or
3. Offering dual enrollment courses with a supplemental support course, an approach used successfully in early and middle college high schools (Barnett, Bucceri, Hindo, & Kim 2013; Barnett & Stamm 2010).

High school and college collaborative work

Colleges are the providers of the courses taken by dual enrollees and can play an important role in making schools and students aware of the available options. They can also work to lower barriers to participation in terms of cost (e.g., tuition, fees, counseling, and enrollment procedures) and logistics (e.g., course times and locations). At the same time, it is critical to maintain the quality and credibility of these courses so that they offer authentic collegiate experiences to students.

To broaden participation in dual enrollment, high schools and colleges may want to make available “College 101” student success courses, or career and technical education courses, which often have lower eligibility requirements. In addition, colleges can disseminate information on their policies regarding acceptance of dual enrollment, AP, and IB credits so that schools and students understand how participation can accelerate their completion of college credentials.

ATTAINMENT: MATH AND ENGLISH FOUNDATIONAL KNOWLEDGE AT THE COLLEGE LEVEL

Research base

While participation in a variety of rigorous courses is important preparation for college, extra emphasis should be placed on acquiring foundational knowledge in math and English. High levels of literacy and numeracy are important for success in a range of disciplinary areas (Conley 2007). In addition, colleges often test for math and English knowledge and skills when students enroll—and place them into remedial courses if they are not at the college level. Participation in remedial, or developmental, courses often results in lower rates of college persistence and completion (Jaggars & Stacey 2015).

High school role

High schools should take responsibility for making sure that all graduates are ready for college-level math and English courses upon graduation. They should be aware that meeting high school graduation standards does not automatically translate into college readiness in these subjects (Kirst & Venezia 2004). Thus, it is important to assess students for college readiness when they are in 11th grade and provide opportunities to attain college readiness in 12th grade. In a number of states, this is already widely done. The recently developed tests associated with the Common Core State Standards (Smarter Balanced and PARCC)—as well as tests that individual states are developing to meet their own college- and career-ready standards—will allow even more 11th graders to receive feedback about their readiness level.

High school and college collaborative work

Colleges are the ultimate arbiters of the standards of college readiness. They also have much to gain by making sure that students are prepared for college before they enroll (Levine & Kirst 2015). Colleges around the country are administering early college-readiness assessments in their feeder high schools to provide them with information on who is ready for college and who is not.⁵ Students who are ready may be offered dual enrollment opportunities. Those who are not yet ready may be offered math or English “transition courses” during their senior year, co-designed by high school and higher education partners (Barnett, Fay, Trimble, & Pheatt 2013).

ATTAINMENT: EARNING A GOOD HIGH SCHOOL GPA

Research base

Multiple studies have found that the most important predictor of success in college is a student’s high school

High schools should take responsibility for making sure that all graduates are ready for college-level math and English courses upon graduation. They should be aware that meeting high school graduation standards does not automatically translate into college readiness in these subjects.

GPA (DeBerard, Spielmans, & Julka 2004; Kahn & Nauta 2001; Roksa & Calcagno 2008). Grades reflect actual knowledge gained and skills developed in the context of classes and assignments, rather than simply the ability to do well on a test (Belfield & Crosta 2012).

High school role

High schools should help students and parents understand the importance of maintaining a good GPA from the beginning of high school or even earlier. Students may not understand the longer-term implications of decisions they make regarding how much effort to devote to their studies (Boroch & Hope 2009). At the same time, it is not enough just to understand the value of a good GPA. Students need a range of supports—including supplemental instruction and tutoring, help with family and financial issues, and peer and adult mentoring—to make sure that they have every opportunity to meet this momentum point. Schools may want to institute an early warning system to make sure that students who fall below a certain GPA receive extra supports.

High school and college collaborative work

Colleges can provide information to high schools and students on the links between high school performance and college success. Ideally, this information could come from a college's internal research on the success rates of students from particular high schools who entered college with different GPAs. They can also offer clear information on the majors and career options that are likely to be open to students at each academic performance level.

ATTAINMENT: ACCRUING SIX COLLEGE CREDITS DURING HIGH SCHOOL

It is not enough just to understand the value of a good GPA. Students need a range of supports—including supplemental instruction and tutoring, help with family and financial issues, and peer and adult mentoring.

Research base

As noted earlier, participation in dual enrollment is predictive of college success.

In addition, attaining a certain number of college credits has value in itself. According to Adelman (2006), earning less than 20 credits by the end of the first calendar year of college enrollment creates a serious drag on degree completion. He therefore proposes that students accrue college credits while in high school “so that students enter higher education with a minimum of 6 additive credits to help them cross that 20-credit line.” In addition, Leinbach and Jenkins (2008) point to college credit accumulation as contributing to student momentum in their studies of Washington State community colleges, lending credence to the idea that earning credits in high school can help students to succeed in college.

High school role

High schools can make sure that every student is able to take two college courses, typically worth six college credits, during high school. Alternatively, students can be encouraged to take AP and IB courses. Although they don't guarantee college credit, students who pass associated exams are generally awarded college credit.

High school and college collaborative work

Colleges can work with high schools to provide access to a range of dual enrollment opportunities and to support students so that they successfully complete them. They can also provide data analyses showing how students perform in dual enrollment courses and whether courses will count toward specific programs of study at the college.

NONCOGNITIVE SKILLS

As noted above, success in college depends on more than just academic knowledge and skills. Noncognitive skills are also important for college success (García 2014), as are school environments that attend to students' social and emotional learning (Hamedani & Darling-Hammond 2015). In alignment with Sedlacek (2011), we use the term “noncognitive” to refer to skills and qualities related to adjustment, motivation, and student perception. Sedlacek (2011) and Levin (2012) argue that noncognitive, self-regulatory behaviors are significantly related to educational achievement. Importantly, most scholars agree that they can be taught. Common examples of noncognitive skills include affective dispositions and nonacademic skills such as time management, perseverance, and goal setting. We propose that the following noncognitive experiences and attainments in high school contribute to college readiness and success:

EXPERIENCE: OPPORTUNITIES TO DEVELOP PERSONAL GOALS AND LIFE DIRECTION

Research base

The opportunity to develop goals, both academic and occupational, is associated with a greater likelihood of entering and persisting in postsecondary education (Harackiewicz, Barron, Tauer, & Elliot 2002; Terenzini, Cabrera, & Bernal 2001). In their report *Swimming Against the Tide*, Terenzini et al. (2001) note that, particularly for students from low socioeconomic status backgrounds, an early predisposition toward college enrollment is an important predictor of eventual college

Research suggests that congruence between a student's interests and chosen major positively impacts college outcomes, including GPA and persistence.

enrollment. Further, students who enter college with a clear career goal in mind are likely to experience a more positive adjustment (Germeijs & Verschueren 2007). Research suggests that congruence between a student's interests and chosen major positively impacts college outcomes, including GPA and persistence (Graunke & Woosley 2005; Tracey & Robbins 2006). At the same time, it is often difficult for students to learn about the variety of options available—or to assess these options in terms of personal fit, knowledge, skills required, credentials offered, or costs.

High school role

High schools generally provide assistance to students in figuring out their educational and career goals, although the amount of time devoted to this varies. Light-touch ways of helping students with career/major selection include career inventories, college visits, and guidance counseling. More substantive assistance occurs in the context of career pathway programs (e.g., career academies, California's Linked Learning initiative), job experiences (e.g., internships, service learning, and co-ops), career-focused dual enrollment, and apprenticeships. However, working with colleges could strengthen all these efforts.

High school and college collaborative work

Colleges have an explicit interest in making sure that students identify a major/career in high school, as students who begin college with a major in mind are more likely to persist and graduate (Bailey, Jaggars, & Jenkins 2015). Community and regional four-year colleges are especially well positioned to provide information to high school students about emerging career opportunities. They typically work closely with area businesses and industries to prepare students for jobs and address local economic development needs. In addition, colleges may be able to provide concrete assistance to help students learn about college and career options. For example, research on high school-college partnerships conducted in Texas identified colleges that sent counselors to spend part of each day in high schools, sponsored college and career fairs, and provided career-exploration units that were embedded in regular high school classes (Barnett et al. 2012).

EXPERIENCE: OPPORTUNITIES TO DEVELOP AND STRENGTHEN A RANGE OF NONCOGNITIVE SKILLS PREDICTIVE OF COLLEGE SUCCESS

Research base

Research indicates that noncognitive, self-regulatory skills are critical to success in college and life in general (Kitsantas et al. 2008; Levin 2012; Zeidenberg, Jenkins, & Calcagno 2007). The evidence base points to several as especially important. Levin (2012) suggests that conscientiousness, or the degree to which a person is efficient and organized, is correlated with higher GPAs among university students. Duckworth and colleagues (2007) argue that conscientiousness is highly related to persistence or "grit," the ability to maintain focus and the desire to surmount challenges in order to achieve long-term goals. Duckworth and colleagues found that higher grit scores were associated with higher college GPAs and other indicators of educational attainment. Kitsantas and colleagues (2008) tested a host of self-regulatory skills; their study revealed that time-management skills were especially predictive of student GPA into the sophomore year of college.

High school role

Scholars believe noncognitive skills can be developed to a considerable degree (Levin 2012); in some schools, they are explicitly emphasized. For example, Hamedani and Darling-Hammond (2015) describe three high schools that prioritize social and emotional learning, including self-awareness and self-management. These schools seek to educate the "whole student" by providing a physically and emotionally safe learning environment, developing close and caring relationships among all members of the school community . . . and supporting students through critical transitions into college and career" (pp. 4-5). Schools wanting to take a more modest approach to developing noncognitive skills can identify those that they consider most important and structure activities across the curriculum to develop them. (*Another report in this series describes strategies supported by evidence to build noncognitive skills.*)

High school and college collaborative work

Some colleges have developed explicit approaches to teaching noncognitive skills, most notably in the context of first-year experience programs and student success courses, typically offered to students beginning college. In these, colleges often teach students how to manage their

time, prioritize their responsibilities, seek help as needed from faculty, and other related skills (Karp et al. 2012). Zeidenberg, Jenkins, and Calcagno (2007) found that community college students who enrolled in student success courses were more likely to persist, earn a credential, and transfer to a four-year institution than similar students who did not participate. Colleges can provide student success courses as a dual enrollment option. They may also share curriculum and materials from their student success courses and first-year experience programs with high schools, which can embed the lessons into existing courses.

ATTAINMENT: GOOD ATTENDANCE

Research base

Allensworth, Gwynne, Moore, and de la Torre (2012) found that attendance in middle school is one of the most important predictors of academic performance in high school. They also found that attendance tends to be more variable over time than GPA or test scores (the other top predictors for academic performance in later grades), which tend to remain fairly constant. Thus, Allensworth et al. argue that interventions aimed at attendance improvement may have bigger payoffs for student performance than those aimed at test score improvement. Further, regular attendance in high school can mean the difference between a student who is on track to graduate college ready and one who is not. Balfanz and Byrnes (2012) cite numerous studies that demonstrate the connections among school days missed, student performance, and high school graduation rates.

High school role

Schools can combine the use of rewards and penalties to place emphasis on student attendance. They can communicate to students and parents the importance of attendance not only for today's learning but also to establish habits and practices that are associated with lifelong success. Smith and Wertlieb (2005) recommend that schools' expectations for attendance increase as students approach the end of high school, thereby inculcating the importance of consistently going to class and developing time-management skills.

High school and college collaborative work

While colleges are unlikely to be able to intervene directly in students' attendance in high school, they can

demonstrate interest in students' attendance records. They may want to offer special opportunities (e.g., campus visits, access to college facilities) to students with higher GPAs and a good attendance record.

ATTAINMENT: SHOWING READINESS ON A NONCOGNITIVE ASSESSMENT

Research base

Levin (2012) recommends administering noncognitive skill assessments in addition to cognitive skill assessments. In the same way that college readiness is tested through the use of placement tests in math and English, some form of assessment could gauge students' readiness for college in selected noncognitive skills. For example, given the importance of time-management skills for success in college (Kitsantas et al. 2008), this could be a focus for assessment. Schools could provide interventions for students whose assessment performance indicates they are not college ready (Levin 2012).

High school role

While it is difficult to add assessments to the large number already in use in K-12 education, it may be possible to add limited sets of questions to existing assessments to understand selected college readiness skills. Duckworth's 12-Item Grit Scale (Duckworth & Quinn 2009) has shown value in predicting success in a variety of arenas related to perseverance toward long-term goals including GPA and educational attainment. It is possible that scales from the Learning and Study Strategies Inventory (Weinstein, Schulte, & Palmer 1987) or Educational Testing Service's SuccessNavigator (Kyllonen 2005) could be used in a similar manner. Students could receive information and counseling about their results and teachers might work collaboratively to develop interventions that address areas in which many students struggle.

High school and college collaborative work

Colleges may be able to provide access to relevant assessments. They may also consider engaging their faculty in working with K-12 teachers to develop interventions for students that help them develop the noncognitive skills that are particularly relevant for success in college. As noted earlier, college student success courses or course units that address noncognitive skills may be offered for dual credit.

COLLEGE CULTURAL CAPITAL

“Cultural capital” is a term used to denote the knowledge, skills, education, and personal advantages that enhance the ability to thrive socially and economically (Bourdieu 1986). “College cultural capital,” as used here, refers to the knowledge, skills, education, and personal advantages that permit students to enroll and succeed in college. It encompasses the term “college knowledge” as used by Conley (2012) and others who have built on his work (e.g., Borsato, Nagaoka, & Foley 2013). We focus on several research-supported dimensions of college cultural capital that contribute to students’ momentum toward college success and that high schools and colleges can enhance during the high school senior year. These include the knowledge, tools, and assets required to navigate the transition to college. We propose that the following experiences and attainments related to gaining college cultural capital in high school contribute to college readiness and success:

EXPERIENCE: EXPOSURE TO COLLEGE NORMS AND EXPECTATIONS

Research base

Research suggests that exposing students to norms and expectations that they will encounter in postsecondary institutions helps them in the transition to college (Smith & Wertlieb 2005). This includes helping them to become more independent at managing their own learning processes and knowing when and how to seek help from others when needed (Conley 2007). In addition, a number of scholars emphasize the importance of understanding the processes involved in exploring

college options, applying to college, and seeking financial aid (Conley 2007; Kirst & Venezia 2004). This kind of exposure is especially important for students from groups underrepresented in college and those who may become the first in their families to attend college.

Kirst and Venezia (2004) note that the historic divide between the K-12 and higher education systems makes it difficult for students to understand what college entails. They discuss the need for “institutional arrangements . . . that communicate signals, meaning, and expected behavior to students and secondary schools” (p. 19). Similarly, Boroch and Hope (2009) argue that “the senior year must be reframed as a vital bridge to the first year of college, setting appropriate expectations for postsecondary performance and instilling confidence that students will succeed when they transfer” (p. 12).

High school role

Students can receive useful feedback on their academic readiness for college by taking early college readiness assessments in high school (Howell, Kurlaender, & Grodsky 2010). In addition, many high schools encourage teachers to discuss college expectations and norms, and some offer related curricula. More concrete assistance is necessary to help students with the process of applying and transitioning to college. McDonough (2005) advocates for increasing the number of high school guidance counselors devoted to the college transition. Perna (2002) encourages in- and out-of-school programs to offer extensive guidance on college options, college visits, taking college admissions tests, financial aid, and other areas.

High school and college collaborative work

Colleges can provide opportunities for students to spend time on campus and learn about the college environment by sitting in on college courses, touring the college, attending on-campus job fairs, or participating in lab-based activities (e.g., science labs, health occupations labs). Colleges can also expose students to college expectations by offering college readiness assessments to them in high school, opportunities to interact with college student mentors, or access to college counseling. Long Beach College in California has emphasized community outreach to parents and students in order to communicate important information about college access and expectations (Hyslop & Tucker 2012).

EXPERIENCE: VALIDATION BY FACULTY

Research base

Zajacova, Lynch, and Espenshade (2005) posit that self-efficacy, defined as students’ confidence in their ability to carry out academic tasks, can influence their outcomes. Their research revealed that academic self-efficacy had a strong positive effect on college freshmen grades and credits and was, in fact, the single strongest predictor of college GPA (although it had no significant effect on persistence). Students, especially those from traditionally underserved groups, are likely to lack confidence in themselves unless they are actively “validated” as capable students by members of the academic community (Rendon 1994). Barnett (2011) found that when validated by college faculty, students were more likely to persist in college.

High school role

Barnett (2011) suggests that teachers be provided professional development for the types of validation most strongly correlated with improved self-efficacy and good student outcomes. These may include communicating to students that their individual histories and backgrounds are understood and valued, demonstrating a willingness to provide students with out-of-class assistance, and encouraging students of color to participate in class discussions.

High school and college collaborative work

Higher education representatives may also be in a position to validate high school students during interactions with them. Rendon (1994) suggests that a range of institutional representatives can play an important role in validation. College recruitment staff and those who interact with high school students during college fairs or other on-campus activities may be able to provide this kind of validation.

ATTAINMENT: COMPLETION OF ONE OR MORE COLLEGE APPLICATIONS AND THE FAFSA

Research base

Research from the Consortium on Chicago School Research has found that many students do not take all the concrete steps involved in applying to college, especially if they are from low-income households or have parents who did not attend college (Nagaoka, Roderick, & Coca 2009). Of Chicago high school graduates who aspired to complete a four-year degree, only 41 percent completed each of the steps required (deciding to apply, application, acceptance, enrollment) and entered a four-year college the following fall. In addition, many did not understand how to apply for financial aid. Students who were accepted to a four-year college were 29 percentage points more likely to attend if they had completed the Free Application for Federal Student Aid (FAFSA) (Roderick, Nagaoka, Coca, & Moeller 2008).

High school role

High schools can develop systems to make sure that every student completes at least one college application, whether or not they intend to go to college. Most students can benefit from help in managing the application process, and even among those who do not plan to attend college, many will eventually change their minds. In addition, parental involvement is key to completing FAFSA forms (Wisconsin HOPE Lab 2015); schools can structure opportunities for parents and children to work together to complete these forms.

High school and college collaborative work

College recruiters are skilled at helping students to complete applications and sort out financial aid processes. High schools can ask colleges to allow recruiters to spend time with their students to assist them with these steps.

ATTAINMENT: COMMITMENT TO ATTEND A COLLEGE IN THE FALL FOLLOWING GRADUATION

Research base

According to Adelman (2006), students are considerably more likely to complete college if they enroll right after high school graduation. Based on his extensive analysis of student enrollment patterns, he notes that the “later they show up, the more their postsecondary fate is in jeopardy” (p. xxvi).

Students are considerably more likely to complete college if they enroll right after high school graduation. The later they show up, the more their postsecondary fate is in jeopardy.

Further, studies of so-called “summer melt” find that 10 percent to 40 percent of students who intend to enroll in college in the fall following graduation from high school never matriculate because they do not follow through on furnishing required forms and finishing enrollment processes—especially first-generation college students whose families have little experience navigating the college transition process (Castleman & Page 2014).

High school role

High schools can work with students to encourage them to enroll in college immediately following high school graduation. They can maintain records of students who have submitted required paperwork and follow up with those who have not yet done so. When possible, summer programming for recent graduates can acclimate students to college campuses or offer other forms of encouragement and support.

High school and college collaborative work

Colleges can examine their practices to minimize barriers to enrollment in the fall following high school graduation. Colleges can work with high schools to keep track of admitted students; steps should be taken to remind students to register and provide them support in doing so. Colleges can even offer priority enrollment and course registration to students graduating from partner high schools.

CO-CREATING MOMENTUM CHAINS IN PRACTICE

High schools typically provide many opportunities for experiences and attainments discussed above. Some students do leave high school with an accumulation of these essential college-ready experiences and attainments. Often, however, high schools and colleges make these opportunities available, but do not systematically offer them to all students. Some students may participate in one activity, while others participate in another. Thus, the impact on student outcomes is likely to be less than schools intend, except in the case of students who actively seek out multiple opportunities.

In this paper, we argue the need to better prepare all students for college through the intentional implementation of these opportunities as a series of momentum points that build and sustain a student's forward momentum toward college readiness. Further, we suggest in this series of papers that K-12 and higher education assume joint responsibility for students during the 12th-grade year, that they work together to ensure that all students have access to multiple opportunities to accumulate experiences and attainments, and that they co-create momentum chains that will contribute to more universal student success. Thus, we propose that high schools and colleges co-design, co-deliver, and co-validate a series of interventions to help students in the transition from high school to college.

Co-design

The co-design process would typically begin with a multifaceted needs assessment. This might involve talking with teachers, guidance counselors, and partnering staff from colleges about students' strengths, as well as ways in which students are struggling to become college ready. The foundation for this collaboration could be a review of data on student performance and progress. A next step could involve an analysis of the barriers students face in trying to complete all of the momentum points listed in the above chart "Experiences and Attainments That Provide Momentum." (See p. 4.) Partners may then want to conduct an inventory of existing programs and resources at the high school and college and map that inventory against the data points and identified barriers to progress.

Based on the information gathered, and guided by the ideas included in this report, the team responsible for implementation can create a collaborative plan to build or strengthen the momentum chain, based on available resources and priorities. This could involve incorporating current activities into the momentum chain and filling in gaps (as needed and feasible). The proposed plan would be shared with leadership and key stakeholders for input.

Co-delivery

While we recommend that representatives of both K-12 and higher education be involved in planning, not all implementation need be collaborative. Rather, high schools and colleges will deliver those courses and services that they generally provide, and collaborate when it makes sense. At the same time, ongoing coordination will be needed to make sure that implementation works well for students as well as for the participating institutions.

To ensure high-quality and widespread delivery, schools should monitor 12th-grade students' progress toward completion of the momentum points. The Appendix provides an example of a tool that could be adopted or adapted for this purpose. The results of this monitoring can be used to make sure that students complete as many of the key momentum points as possible and to consider ways to continuously improve and strengthen the momentum chain system.

Co-validation

Co-validation has three dimensions—affirmation, utilization, and evaluation. We recommend that K-12 and higher education systems collaborate on all three:

- Co-validation requires that both K-12 and higher education jointly and publicly *affirm the value of the momentum points* and associated activities. Most important, colleges can review each of the experiences and attainments in the momentum chain and confirm that they reflect the content and quality needed to meet collegiate standards.
- Utilization involves concrete *actions that signal the value of specific momentum points*. For example, high schools may make high school graduation (or graduation with honors) contingent upon the completion of certain momentum points. Colleges may make placement decisions based on students' completion of transition courses, or may award credit for successful completion of dual enrollment courses.
- Finally, K-12 and higher education can *evaluate the outcomes of co-designed and co-delivered momentum chains*, thereby co-validating this approach. An important aspect of this would be to conduct research on whether student outcomes improve as a result of completing momentum points.

We propose that high schools and colleges co-design, co-deliver, and co-validate a series of interventions to help students in the transition from high school to college.

DEVELOPING A SYSTEM OF **SHARED** **RESPONSIBILITY** FOR STUDENT MOMENTUM

We propose a system in which K-12 and higher education share responsibility for student success in preparing for, enrolling in, and completing college. Under this system, (1) all students would leave high school with momentum toward earning a college credential; (2) high schools would take primary responsibility for implementing the initiatives; (3) higher education would play a key role in framing the problem and collaborating with K-12 on implementing solutions; and (4) local and state governments would incentivize K-12 and higher education to play these roles. The following conditions could support the development of a system of this kind:

VISIBLE DATA

A lack of readily available data currently hampers partnerships between K-12 and higher education. As a result, it is often difficult to know which students are transitioning from specific high schools to local colleges and how they fare once there. Much could be done at the local, regional, and state levels to make data more readily available and easy to use. The College Summit (Schramm & Zalesne 2011) calls on states to take primary responsibility for making data available to educators, specifically by: (1) improving systems for measuring student success in college, (2) making student data widely available,

(3) providing technical assistance to support the use of data, and (4) providing rewards to those who improve student performance. *(Another report in this series highlights promising strategies for secondary and postsecondary education partnerships to use data to support the transition from high school to college.)*

ACCOUNTABILITY

At the moment, K-12 and higher education systems have few incentives to work together. Their accountability and funding systems are almost completely separate; in some cases, the two sectors are competing for resources and attention. Further, Hyslop and Tucker (2012) point out that current K-12 accountability systems often reward test results and pay little attention to metrics that truly matter, such as success in college and careers. They remark that “making a transition to an index that incorporates at least some measures of readiness would relieve the pressure on educators to teach to the test, and it would give schools incentives to better equip students for what comes next” (p. 13).

A number of organizations are joining the call to incorporate better metrics into both K-12 and higher education accountability systems. For example, the National Governors Association recommends that states incorporate measures related to college and career readiness into their K-12 accountability systems, including such metrics as AP and IB exam scores, success in dual enrollment courses, or enrollment and persistence in college (Reyna & Grossman 2012).

Congress has been responsive in its recent reauthorization of the federal Elementary and Secondary Education Act

(known as the “Every Student Succeeds Act”). The new law incorporates student participation in college coursework in local school and state report cards as a component of local school district plans to transition students to postsecondary education, and as a potential indicator in state accountability systems.

For colleges, performance funding systems are often based, at least in part, on rates of completion (National Conference of State Legislatures 2015), increasing the likelihood that colleges will pay attention to the college readiness of their future students.

DURABILITY CONDITIONS

Important cross-sector initiatives are often hampered by changes in funding, personnel, and local conditions. These changes can reduce the likelihood of sustaining collaborative efforts. However, researchers associated with the National Center for Postsecondary Research found that colleges and high schools that had developed a range of shared initiatives were more likely to sustain their partnerships and their collaboratively sponsored activities (Barnett et al. 2012). In addition, more durable funding streams can play an important role in sustaining partnership initiatives. For example, a number of states allow both K-12 systems and colleges to collect public funds for dual enrollment courses, making it much more likely that the institutions can continue to offer them over time (Zinth 2015).

High schools that had developed a range of shared initiatives were more likely to sustain their partnerships and their collaboratively sponsored activities.

CONCLUSION

All students need to leave high school ready for postsecondary education, whether or not they plan to attend college immediately following graduation. Preparing students for college success involves more than just completion of academic coursework; it requires providing them with momentum that will allow them to succeed during their college years. “One-off” experiences and attainments are not sufficient. High school students should be encouraged and enabled to accumulate experiences and attainments that collectively form a momentum chain. As students complete these steps, they will become increasingly ready for a future that includes success in college and in life.

APPENDIX:

TOOL FOR MONITORING MOMENTUM CHAIN EXPERIENCES AND ATTAINMENTS

Beginning in 11th grade, use this tool to monitor students' accumulation of experiences and attainments that predict success in college. The process should be repeated periodically, perhaps twice per school year.

Student name: _____ Monitoring date: _____

| MOMENTUM POINTS | | EXPERIENCE OR ATTAINMENT? | NO/IN PROGRESS/YES |
|--------------------------------------|--|---------------------------|--------------------------------------|
| Academic Knowledge and Skills | Participating in a rigorous core curriculum in high school | Experience | <u> </u> N <u> </u> IP <u> </u> Y |
| | Taking college-level courses, specifically dual enrollment, AP, and/or IB | Experience | <u> </u> N <u> </u> IP <u> </u> Y |
| | Math and English foundational knowledge at the level required for placement in college-level, credit-bearing courses | Attainment | <u> </u> N <u> </u> IP <u> </u> Y |
| | Earning a good high school GPA | Attainment | <u> </u> N <u> </u> IP <u> </u> Y |
| | Accruing six college credits during high school | Attainment | <u> </u> N <u> </u> IP <u> </u> Y |
| Noncognitive Skills | Opportunities to establish personal goals and life direction | Experience | <u> </u> N <u> </u> IP <u> </u> Y |
| | Opportunities to develop and strengthen a range of noncognitive skills predictive of college success | Experience | <u> </u> N <u> </u> IP <u> </u> Y |
| | Good attendance | Attainment | <u> </u> N <u> </u> IP <u> </u> Y |
| | Showing readiness on a noncognitive assessment | Attainment | <u> </u> N <u> </u> IP <u> </u> Y |
| College Cultural Capital | Exposure to college norms and expectations | Experience | <u> </u> N <u> </u> IP <u> </u> Y |
| | Validation by high school and college faculty | Experience | <u> </u> N <u> </u> IP <u> </u> Y |
| | Completing one or more college applications and the FAFSA | Attainment | <u> </u> N <u> </u> IP <u> </u> Y |
| | Commitment (submission of paperwork) to attend a college in the fall following graduation | Attainment | <u> </u> N <u> </u> IP <u> </u> Y |

ENDNOTES

- ¹ While the term “momentum chain” has not, to our knowledge, been used in reference to education pathways, it is found in other domains, in particular sports psychology. See, for example, Taylor and Demick’s model in Taylor, J. & Demick, A. 1994. “A Multidimensional Model of Momentum in Sports.” *Journal of Applied Sport Psychology*. Vol. 6, 51-70.
- ² Merriam-Webster defines “momentum” as “strength or force gained by motion or by a series of events.”
<http://www.merriam-webster.com/dictionary/momentum>
- ³ The College Readiness Indicator System initiative was a joint effort of three research partners: The Annenberg Institute for School Reform at Brown University, the John W. Gardner Center for Youth and Their Communities at the Stanford University Graduate School of Education, and the University of Chicago Consortium on School Research.
- ⁴ The ACT-recommended core curriculum is four years of English and three years each of math, science, and social studies.
<http://www.act.org/research/policymakers/cccr14/pdf/CCCR14-NationalReadinessRpt.pdf>
- ⁵ According to the Education Commission of the States, 47 states administer statewide high school assessments aligned with college- and career-ready standards. In most cases, these assessments are not administered by colleges. There are numerous colleges that do administer college placement tests in high schools, but there are no national figures on how many are doing so.

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