

REVIEW PROTOCOL FOR STUDIES OF INTERVENTIONS TO SUPPORT THE TRANSITION TO COLLEGE VERSION 4.0

This protocol guides the review of research that informs What Works Clearinghouse (WWC) intervention reports in the Transition to College topic area. This protocol is used in conjunction with the [*WWC Procedures and Standards Handbooks \(Version 4.0\)*](#).

PURPOSE STATEMENT

Enrolling in postsecondary education and completing a degree or certificate is one of the primary pathways for economic success and is increasingly required for employment in a variety of fields. Yet, large numbers of qualified students fail to apply to and enroll in college (e.g., Avery, 2013; Hoxby & Avery, 2012). Although the percentage of students enrolling in higher education has steadily increased in United States in the past several decades, disparities in college access by race/ethnicity, family income, and gender have increased over the same period (Bailey & Dynarski, 2011). Barriers to college access include a lack of financial resources; academic readiness, familial support, and information resources (Page & Scott-Clayton, 2016; Castleman, Owen, & Page, 2015). Even after students are accepted to college, they may not matriculate due to unanticipated financial, informational, and socioemotional barriers that prevent college entry (Castleman & Page, 2014).

A number of programs and practices are available for the secondary school levels¹ that aim to improve college readiness and access and support the transition to college. Interventions relevant to this topic area are diverse in the sense that they can involve a variety of programmatic strategies and target students of different ages and with different demographic and academic characteristics.

WWC reviews in this topic area focus on interventions for secondary and postsecondary students that aim to support college access and enrollment, as well as academic achievement, school completion, and ultimately, success in the labor market. Systematic reviews of evidence in this topic area address the following research questions:

- Which interventions are effective at helping students improve access and enrollment in college?
- Which interventions are effective at helping students increase credit accumulation and persistence in college?
- Which interventions are effective at helping students improve academic achievement?
- Which interventions are effective at helping students complete college?
- Which interventions are effective at helping students improve their prospects in the labor market?

¹ Secondary students are defined as students in grades 6-12 or ages 12-21 and still enrolled in secondary school.

- Which interventions are effective at helping students improve college readiness, including academic performance, attendance, persistence, and taking the necessary steps to apply to college?
- Are reviewed interventions more or less effective for certain subgroups of students (including first-generation college students, women, racial/ethnic minorities, academically underprepared students, students from low socioeconomic status backgrounds [e.g., Pell Grant recipients], and/or community college students)?

KEY DEFINITIONS

The descriptions below capture some of the types of interventions that are covered by this protocol. However, it is not a comprehensive list of the programs, policies, and interventions that are covered.

College Coaching or Mentoring Programs

College coaching and mentoring programs are designed to put middle school and high school students on the path to college readiness and success. These programs offer a variety of services in secondary school to help students become aware of postsecondary options, enhance postsecondary expectations, improve college readiness, find the right college, apply to college, graduate from high school, enroll in college, and navigate the financial aid process. Coaches and mentors serve as a role model to students and may provide tutoring and help with selecting courses, standardized testing, college applications, completing the FAFSA, college visits, and taking steps to enroll in college after they are accepted. These programs are sometimes targeted to first-generation college students, whose families may lack experience with the college application process.

Credit Recovery Programs

Credit recovery programs for high school and postsecondary students are programs that permit students to take high school, developmental, or transfer courses they may have missed or failed previously. In postsecondary settings, credit recovery programs are often billed as a method for transfer or returning adult students to maximize their transfer credits upon enrollment. Credit recovery programs may be offered in brick-and-mortar settings, but are increasingly offered online. As such, credit recovery programs may employ a variety of instructional formats, including traditional instruction (e.g., lectures), one-on-one instruction or tutoring, or independent study.

Dual enrollment programs

Dual enrollment programs allow high school students to take college courses and earn college credits while still attending high school. Such programs, also referred to as dual credit or early college programs, are designed to boost college access and degree attainment, especially for students typically underrepresented in higher education. Dual enrollment programs support college credit accumulation and degree attainment via at least three mechanisms. First, allowing high school students to experience college-level courses helps them prepare for the social and

academic requirements of college while having the additional supports available to high school students; this may reduce the need for developmental coursework. Second, students who accumulate college credits early and consistently are more likely to attain a college degree. Third, many dual enrollment programs offer discounted or free tuition, which reduces the overall cost of college and may increase the number of low socioeconomic status students who can attend and complete college.

Summer bridge programs

Many colleges have identified student populations at risk for academic problems in their first year. To better prepare these students, some postsecondary institutions have instituted summer bridge programs, in which eligible students enroll in the summer and are provided with a variety of resources designed to ease their transition from high school into college. These have taken a variety of forms based on the nature of the institution and the targeted student group, but often involve accelerated instruction, college readiness preparation and skills building, or options for earning college credits. These programs are similar in nature to those interventions designed to support students during the critical first year, but are implemented in the summer bridge period between high school completion and college enrollment.

ELIGIBILITY CRITERIA

Identifying Studies for Review

The *WWC Procedures and Standards Handbook (version 4.0)* discusses general procedures for conducting a literature search. Once interventions have been identified as being targets for an intervention report, the WWC will conduct an electronic database search and supplement this with targeted searches of government and non-government agency websites, relevant non-profit organizations that might fund research on the intervention, and by reviewing the bibliographies of literature reviews, meta-analyses, and primary studies of the intervention under review. The review team will also search the WWC database of previously reviewed studies to identify studies that have met standards in prior reviews. Those studies will be re-reviewed using the eligibility criteria and evidence standards described in this protocol. The team will also identify studies that have been rated as ineligible in prior reviews and will confirm that they are ineligible for this review based on the criteria described in this protocol. A broad search strategy for the interventions for students in the transition to college topic area is detailed in Appendix A.

Studies must meet several criteria to be eligible for review. These relate to the population that was sampled, the intervention that was studied, the study design that was used, outcomes that were measured, and when the study was conducted. Each of these is discussed below.

Eligible Populations

While the WWC is interested in interventions to support students from disadvantaged backgrounds, minority students, and prospective first generation college students, the review is not restricted to students from these populations and will include students from all backgrounds ranging from grade 6 (or 11 years old) up to enrollment in postsecondary education.

- **Location.** To be eligible for review under this protocol, a study must include students in secondary school in the United States or Canada.
- **Grade Range.** Studies with students who were grades 6-12 at the time they received the intervention are eligible for review. If the sample is not clearly identified as being in grades 6-12, students must be between the ages of 11-21 at the time they received the intervention. If a study includes younger students in the sample, the average age of the sample must be at least 11 or the majority (> 50%) of the sample must be in grades 6-12. The upper age boundary for this review includes interventions or strategies that are provided prior to a student's first enrollment at a postsecondary institution. Studies for which neither the grade level nor the age of the sample is specified are not eligible for review.

Studies with samples of students who have enrolled in postsecondary institutions at the beginning of the intervention are not eligible under this review protocol, but are reviewed under the Review Protocol for Studies of Interventions to Support Postsecondary Success, which focuses on interventions for postsecondary students designed to promote success in postsecondary institutions.

In general, the WWC determines a study rating based on average intervention effects and will report subgroup analyses only for groups that are identified in the protocol as being of theoretical, policy, or practical interest. For studies reviewed under this protocol, eligible subgroups include:

- first-generation college students
- racial/ethnic minorities
- gender
- students from low socioeconomic status backgrounds, such as Pell Grant recipients,
- academically unprepared students (e.g., incoming students with developmental course requirements versus those with no developmental requirements)
- secondary school level (i.e., middle or high school)
- community college students.

Eligible Interventions

This review focuses on interventions for secondary school students that aim to promote successful transitions into postsecondary education, with a primary focus on increasing postsecondary access and enrollment and retaining students in postsecondary institutions once enrolled. For this review, transition to college interventions that focus on secondary school students must be *primarily focused on increasing the number of students who transition into postsecondary education, as opposed to simply raising the academic performance of students while in secondary school*. That is, interventions for secondary school students reviewed under this protocol must be explicitly oriented toward increasing college readiness, increasing college

access, or smoothing the transition to college to be eligible for review. Interventions are not required to be delivered in physical institutions to be eligible for review under this protocol. Interventions delivered by institutions that operate wholly or partially online are eligible for review if they meet the other requirements specified in this protocol.

Within this framework, a number of broad intervention strategies are relevant, as follows:

- **Interventions to increase the proportion of students who complete the necessary steps required to be eligible and ready for college.** To be eligible to enroll in college, and particularly four-year institutions, secondary school students must complete a series of important steps. These vary from state to state, but are roughly as follows: take grades 6-8 classes that are appropriate for the college preparatory sequence in grades 9-12; take the college preparatory course sequence in grades 9-12; take (and pass) the required college preparatory curriculum in the state; take (and do well on) any required college entrance exams; complete the Free Application for Federal Student Aid (FAFSA); apply to a college; respond after being accepted and pay any registration fees; and, finally, show up on campus. Many studies have identified gaps in this process, wherein students complete some but not all of these steps. A variety of interventions have been developed to increase the proportion of students accomplishing many of these steps.
- **Interventions to increase knowledge about college.** Many secondary school students appear to be misinformed about even the basics of college attendance and enrollment (e.g., Avery & Kane, 2004). Students greatly overestimate the price of higher education (Horn, Chen, & Chapman, 2003) and often think that entrance requirements are more stringent than they actually are. Students tend to think that the most difficult thing about college is getting in, when in fact the vast majority of students attend their first choice institution, but many do not complete their first year (i.e., staying in college is harder than getting into college). Well-qualified students from low-income families tend to underestimate their ability to be accepted to and pay for selective institutions. To address this misinformation, interventions have been designed to provide students with accurate information about all of these areas and, by changing student perceptions, increase the likelihood that students will both enroll in college and attend an appropriate postsecondary institution (e.g., Avery & Kane, 2004; Hoxby & Turner, 2013).
- **Dual enrollment and Advanced Placement programs.** In many communities, academically qualified students may enroll in college courses or earn college credits while in high school. The Advanced Placement program allows students to enroll in college-level courses while in high school and receive credit for those courses if they attain a qualifying score on a standardized exam. Dual enrollment programs are an extension of these efforts and involve taking college-level courses through a postsecondary institution while still enrolled in secondary school. Dual enrollment programs are based on the premise that once high school students know what college is actually like, they should be more likely both to enroll in and succeed in college once they have graduated from high school.
- **Immediate enrollment programs.** Many studies have shown that even a slight delay in the time to college enrollment beyond the normal summer to fall delay appears to lower the probability of initial attendance and eventual success. Various interventions have

been designed to ensure that high school seniors enroll in higher education immediately after school instead of delaying enrollment.

See the section “Key Definitions,” above, for the operational definitions of some interventions that are the subject (or potentially are the subject) of WWC reviews.

Only interventions that are replicable are eligible for review. The following characteristics of an intervention will be documented by the WWC, so that practitioners other than developers can reliably reproduce the intervention with different participants, in different settings, and at other times:

- Targeted population;
- Description of intervention provider or administrator, including their qualifications;
- Description of the intervention, including details of the services provided, unit of delivery (e.g., whole class, individual), medium/media of delivery (e.g., teacher-led instruction or software), and other activities that are part of the intervention;
- Length of calendar time and number of hours required to implement the intervention;
- Cost, which may include staff salaries to participate in training or provide the intervention; expenses for space, materials, and equipment needed for training and/or providing the intervention; travel and per diem expenses for training; price charged for intervention participants; and other intervention inputs; and
- Source of funding (when available).

Eligible Research

In order to be eligible for review a study must be a primary analysis of the effects of an intervention. If a study does not examine the effects of an intervention, or if it is not a primary analysis (e.g., if it is a meta-analysis or other literature review), then it is not eligible for review.

- **Topic.** The intervention must focus on the improvement of an eligible outcome, including academic achievement, attendance, college readiness, staying in school, progressing in school, completing school, or college enrollment. Longer-term outcomes may be measured in college attendance, academic performance in college, persistence in college, college completion, or labor market outcomes.
- **Time frame.** The study must have been published within 20 years of the year of the review (for example, 1999 or later for reviews occurring in 2019). Rigorous evaluations of interventions implemented in this time frame test versions of interventions most likely to be available today and under conditions most likely to be current. For updated intervention reports, the study must have been released since the original intervention report’s literature search start date (i.e., 1994 for reports released under version 3.1 or 3.2 of the transition to college protocol). Studies must be publicly available (accessible online or available through a publication, such as a journal) at the time of the original or updated literature search.

- **Sample.** The study sample must meet the requirements specified above in the “Eligible Populations” section at the time they receive the intervention. For example, while the students in the sample must be in grades 6–12 (or in the summer following high school) at the time that they receive the intervention, their outcomes can be measured after students graduate from high school.
- **Language.** The study must be available in English to be included in the review.
- **Location.** The study must include students in the United States, in its territories or tribal entities, at U.S. military bases overseas, or in Canada.

Review team leadership should be notified when studies present counterfactuals other than business-as-usual (BAU), such as studies that compare two interventions to one another. These studies will be reviewed by review team leadership to determine whether their results can be reasonably combined with other studies without biasing WWC calculations. Review team leadership will advise reviewers on characteristics of the comparison condition to document so the counterfactual can be clearly documented in WWC reports.

Eligible Outcomes

To be eligible for review, a study must also report outcomes from a relevant outcome domain. These may include outcomes measured prior to attending a postsecondary institution while students are in secondary school or outcomes measured while students are transitioning to or attending postsecondary institutions. The following secondary school outcome domains are eligible: (a) academic achievement, (b) attendance, (c) college readiness, (d) staying in school, (e) progressing in school, and (f) completing secondary school. The following postsecondary outcome domains are eligible: (a) college enrollment, (b) college attendance, (c) progressing in college, (d) college academic achievement, (e) postsecondary degree attainment, (f) credential attainment, (g) employment, and (h) earnings. Operational definitions for each outcome domain are provided below.

Secondary School Outcomes

- **Academic achievement**, which assesses the extent to which students master academic content. Examples of ways that academic achievement might be operationally defined in studies include: (a) standardized achievement tests including the SAT and ACT as well as state-mandated tests and (b) grade point averages. Grades or exam scores from individual courses are not eligible under this domain.
- **Attendance** refers to outcomes that measure attendance rates or absenteeism at school. Ways that attendance might be operationalized include the (a) number or proportion of days absent or in attendance during a school term, (b) proportion of students with excessive absences, and (c) referrals for truancy. Objective measures of attendance, such as those from school administrative records are preferred, but student reported measures are acceptable if a more objective measure is not available.
- **College readiness** refers to outcomes that measure student progress on preparedness to enter postsecondary education. Examples of ways that college readiness might be operationally defined in studies include: (a) meeting specific minimal coursework

requirements for entry into postsecondary institutions (e.g., *A-G requirements* for incoming freshmen of the University of California or the California State University systems), (b) completing other key milestones required for entry into postsecondary institutions such as applying for college, completing a structured transition plan, or submitting the Free Application for Federal Student Aid (FAFSA)², or (c) completing college requirements in high school, particularly scores or passage rates for Advanced Placement or International Baccalaureate.

- **Staying in school**, refers to outcomes that measure whether students in grades 9-12 have dropped out of school or whether the student is still enrolled in school.
- **Progressing in school**, refers to outcomes that assess the number of high school course credits the student has earned, whether the student was promoted to the next grade, and the highest grade the student has completed.
- **Completing secondary school**, refers to outcomes that measure whether the student has earned a high school diploma or GED.

Postsecondary Outcomes

- **College enrollment** refers to the process of applying to, actually enrolling, and attending a postsecondary institution. Examples of ways that enrollment might be operationally defined in studies include: (a) actual enrollment in college, (b) number and/or selectivity of admitted and/or enrolling institutions, (c) enrollment by institution type (2 year vs. 4 year), (d) intensity of enrollment (full time vs. part time), and (e) timing of enrollment (e.g., immediate vs. delayed enrollment after high school). On a case-by-case basis, the WWC may accept measures of intentions to enroll, though measures of actual enrollment are preferred when both types are available.
- **College attendance**, refers to outcomes that measure attendance rates or absenteeism at school. Ways that attendance might be operationalized include (a) the number or proportion of days absent or in attendance during a school term and (b) proportion of students with excessive absences. Objective measures of attendance, such as those from school administrative records are preferred, but student reported measures are acceptable if a more objective measure is not available.
- **Progressing in college** refers to progress toward the completion of a degree, certificate, or program. Examples of ways that credit accumulation might be operationally defined in studies include: (a) number of college-level credits earned, (b) number of terms of continuous enrollment, (c) enrolled vs. did not enroll the next semester, and (d) completion of a single course that was the focus of the intervention. Completion of a single course will only be reported if other measures within this domain are not reported by the study. The number of non-college level credits earned (e.g., developmental credits) is not an eligible measure of credit accumulation.
- **College academic achievement** refers to the extent to which students master academic content. As such, eligible measures of academic achievement are those that arise naturally

² Measures of FAFSA submission are preferable to measures that indicate whether the FAFSA was completed; however, if verification of submission is not available, FAFSA completion will be considered an acceptable outcome.

from student educational experiences. Examples of ways that academic achievement might be operationally defined in studies include (a) final grade in a single college-level course, (b) grade point average in college-level courses, and (c) the final exam score in a single college-level course. Scores on department-wide exams, standardized tests, and professional or industry exams (e.g., the GRE and the NCLEX-RN) are also eligible. With the exception of department-wide final exams, measures that exist below the final course grade level are not eligible (e.g., average test score, score on a particular assignment or project). Also ineligible are measures of academic achievement that do not directly contribute to student grades (e.g., a math test that is given after an experimental manipulation, the performance on which has no implications for a student's performance in a specific course).

- **Postsecondary degree attainment.** This domain refers to the completion of an associate or a baccalaureate degree. Outcomes pertaining to completing or progressing toward a graduate-level degree will not be included.
- **Credential attainment.** This domain refers to the completion of an industry-recognized credential, certificate, or license. Examples of ways completion might be operationally defined in a study include (a) certificate completion rates, (b) non-degree-award receipt rates, and (c) certifications from third-party licensing or credentialing bodies.
- **Employment** refers to outcomes related to employment after the postsecondary experience. Examples of ways that employment outcomes might be operationally defined in studies include (a) employed vs. not, (b) employed full-time vs. employed part-time, and (c) employed in field of study vs. not, as defined by the major groups of the Standard Occupational Classification (SOC) System.³
- **Earnings** refers to income from employment after the postsecondary experience. Examples of ways that earnings might be operationally defined in studies include (a) cumulative earnings over the previous six months or (b) earnings in a typical week in the previous month.⁴ Earnings received during a student's course of study are ineligible for review.

Outcomes Measured at Different Points in Time

When outcomes are measured at multiple time points, the follow-up outcome measured closest to the end of the intervention on the full sample will be prioritized as the primary finding. This will allow for more clear attribution of the intervention to the outcome observed (especially in QEDs), relative to prioritizing the longest follow-up observation. Notable exceptions include:

- In the college enrollment domain, the first measure of enrollment (e.g., enrolled vs. not enrolled) is selected as the primary finding. Measures of continued enrollment that occur

³ https://www.bls.gov/soc/2018/major_groups.htm

⁴ Total individual or household income is not an eligible outcome. An intervention that successfully increases individual earnings might decrease public benefit receipt, with the result that the participant's income might increase, decrease, or remain constant even though the intervention successfully increased earnings. Further, household income might include spousal earnings; an intervention that increases a participant's earnings might induce the spouse of the participant to reduce his/her hours worked, especially if the spouse was working an additional job to support the participant during training.

after the first semester or year of college would fall under the progressing in college domain and the follow-up outcome measured closest to the end of the intervention is selected as the primary measure.

- In the attainment domain, the longest follow-up time point will be selected as the primary finding. In the employment and earnings domains, two primary findings will be presented when they are available: (1) the follow-up outcome period closest to the end of the intervention and (2) the longest follow-up time point.

Eligible studies are assessed against WWC evidence standards, as described in the *WWC Procedures Handbook*, Section IV: Screening Studies and Section V: Reviewing Studies, as well as the *WWC Standards Handbook*. Generally, these standards assess outcome reliability and validity, attrition, baseline equivalence, and similar methodological and statistical issues. This review determines the overall WWC study rating (see the *Procedures and Standards Handbook version 4.0* for further details). Details related to sample attrition in RCTs and baseline equivalence in QEDs and high-attrition RCTs are outlined below to highlight the way they are operationalized for this topic area.

EVIDENCE STANDARDS

Eligible Study Designs

Studies that use group designs (RCTs and QEDs), RDDs, or single-case designs (SCDs) are eligible for review using the appropriate standards.

Outcome Measure Requirements

In this review, the requirements for outcome measures are more stringent than those specified in the *WWC Standards Handbook* (in Section IV.A: Outcome Requirements and Reporting). Specifically, this review requires a minimum of 0.60 (as measured by, for example, Cronbach's alpha), for internal consistency to satisfy the reliability requirement for an outcome measure.

Sample Attrition

The *WWC Standards Handbook* discusses the sample attrition standards used by the WWC in the following sections:

- Section II.A—"Sample Attrition: Is the combination of overall and differential attrition high?" – in Step 2 of the WWC review process for individual-level group design studies.
- Section II.B—"Is the study a cluster RCT with low cluster-level attrition?" – in Step 1 of the WWC review process for cluster-level group design studies.
- Section II.B—"Is there a risk of bias due to non-response of individuals?" – in Step 3 of the WWC review process for cluster-level group design studies.
- Section II.D—"Calculating attrition when rating CACE estimates" – in Section 3 of the WWC standards for reviewing complier average causal effect estimates.

- Section III.C—in Standard 2 of the WWC standards for reviewing regression discontinuity designs.

In the *WWC Standards Handbook*, Figure II.2 illustrates the attrition boundary and Table II.1 reports attrition levels that define high and low attrition. Based on the choice of the boundary, the study review guide calculates attrition and whether it is high or low. For most studies this review will entail use of the *optimistic* boundary for attrition based on the assumption that most attrition in studies of interventions focused on the promotion of postsecondary success would be due to factors that are not strongly related to intervention status. We assume that postsecondary students can have a range of life events that lead them to have missing outcome data that are unrelated to intervention status.

Joiners in Cluster Randomized Controlled Trials (RCTs)

According to the *WWC Standards Handbook* (page 23), to receive the highest rating a cluster RCT must limit the risk of bias due to individuals entering the cluster after the time of random assignment. This is because the presence of joiners in an analytic sample might introduce bias into estimates of an intervention's effectiveness. The WWC defines a joiner as any student who enters a cluster, such as a dual enrollment course, after the results of random assignment are known to any individual who could influence a student's placement into a cluster (for example, a guidance counselor). In some cases, joiners might enter clusters after random assignment, but before anyone outside of a study team could have known about cluster random assignment results. The WWC never considers these joiners to pose a risk of bias because the decisions that led these individuals to join clusters could not have been affected by the intervention. However, the burden for demonstrating that individuals could not have known about the intervention rests with the study authors.

In some cases, joiners who enter clusters relatively early in the study period have less potential to introduce bias than those who enter later. This is because late joiners might be more likely to do so because of the intervention. Therefore, the WWC differentiates between *early joiners* and *late joiners*. For this review protocol, we will consider college students to be *early joiners* if they enter a cluster within 6 weeks after the results of random assignment are publicly known. That is, the early period for joiners ends 6 weeks after the start of the school year if the results of random assignment were announced over the summer; otherwise, the early period ends 6 weeks after the results of random assignment were announced. *Late joiners* are those who enter clusters after 6 weeks.

With that background, the general default disposition in for this review is that ***all joiners in the analytic sample are expected to pose a risk of bias*** (there are exceptions for early joiners outlined below). Therefore, a study that includes at least one such joiner in the analytic sample does not limit the risk of bias from joiners. This is because study samples will be comprised of adults who can presumably choose their preferred education experiences, and might purposefully select or avoid a specific developmental education intervention.

An exception to the general default rule that all joiners in the analytic sample pose a risk of bias is when: (a) high schools or blocks of courses within schools represent the unit of assignment, and (b) the following conditions are in place:

- The intervention is not expected to directly affect joiners’ enrollment or placement decisions. One example of an intervention that should not directly affect enrollment or placement decisions is when treatment and comparison groups are offered different types of potentially useful services, such as two competing mentoring interventions. In this case, we would not expect that individuals would be more likely to go out of their way to join one mentoring intervention over the other unless there is time to closely investigate and consider the different options. In this scenario, *only late joiners pose a risk of bias*.
- Another example of an intervention that would likely not directly affect enrollment is when treatment group members receive a low-profile approach that is integrated into curricula of their high school, where individuals are unlikely to know about this add-on to the curricula even after the point of random assignment. This is consistent with aforementioned idea that joiners are likely to be unaware that a cluster is part of a study condition. In this scenario, *only late joiners pose a risk of bias*.

Not all scenarios can be anticipated. When an intervention and unit of assignment in a cluster RCT do not fall into a category described above, the Review Team Leadership has discretion to make a decision about whether the joiners pose a risk of bias. Any time such discretion is exercised, the background and rationale of decisions will be documented in intervention reports

Baseline Equivalence

If the study design is an RCT or RDD with high levels of attrition or a QED, the study must satisfy the baseline equivalence requirement for the analytic intervention and comparison groups. The *WWC Standards Handbook* discusses how authors must satisfy the baseline equivalence requirement in:

- Section II.A—“Baseline Equivalence: Is equivalence established at baseline for the groups in the analytic sample?” – in Step 3 of the WWC review process for individual-level group design studies.
- Section II.B—“Does the study establish equivalence of individuals at baseline for groups in the analytic sample?” and “Does the study establish equivalence of clusters at baseline for groups in the analytic sample?” – in Steps 4 and 7 of the WWC review process for cluster-level group design studies, respectively.
- Section II.D—“Procedures for rating CACE estimates when attrition is high” – in Section 5 of the *WWC Standards* for reviewing complier average causal effect (CACE) estimates.
- Section III.C—in Standard 3 of the *WWC Standards* for reviewing RDDs.

This review assesses baseline equivalence within each domain and analytic sample. Elaborations follow:

- The outcome domains for this review cover multiple constructs, so an *outcome-by-outcome* approach to establishing equivalence is followed. The implication is that it is possible for a baseline difference to exceed 0.25 standard deviations on a given outcome, but this need not influence other outcomes within the domain. So, for example, a large baseline difference in mathematics will render all mathematics outcomes as not meeting

WWC standards, but it would still be possible for a reading contrast from the same study to meet standards with reservations in the academic achievement domain. Furthermore, when the baseline difference for a pre-intervention measure is in the statistical adjustment range (that is, it is between 0.05 and 0.25 standard deviations), the adjustment must be made only in the analysis of the associated outcome measure. For example, if A, B, and C are available as pre- and post-intervention measures all within one domain, and the pre-intervention difference in B requires statistical adjustment, only the analysis of outcome B only must adjust for B.

- In cases where multiple baseline measures of SES and/or academic achievement are available, the Review Team Leadership is responsible for selecting the variable(s) to be used in the baseline equivalence assessment prior to the equivalence assessment being performed. For example, if both math and verbal scores on a college entrance exam are available, and the primary outcome is whether or not students passed their first college level math course, then the Review Team Leadership may decide that the score on the math portion of the entrance exam is the only achievement measure on which baseline equivalence will be assessed. However, if the primary outcome is attainment (and there is no natural pretest), then the Review Team Leadership might decide to assess balance on both the math subtest and the verbal subtest.

1. Baseline equivalence of individuals

For studies that must satisfy baseline equivalence of individuals, including cluster-level assignment studies being reviewed for evidence of effects on individuals, the baseline equivalence requirement must be satisfied for the analytic intervention and comparison groups. Pre-intervention measures of the outcome used in the analysis will be acceptable. However, in some cases it would be unusual to observe a meaningful baseline measure of some postsecondary outcomes, such as degree attainment. Within the transition to college topic area, reasonable pre-intervention characteristics might encapsulate pre-college traits and events, such as high school GPA, college admission tests and work experience. These characteristics can be used as proxy pre-intervention variables to assess baseline equivalence within the domain to which they logically belong. For example, high school GPA can be used to establish baseline equivalence for outcomes within the college academic achievement domain, and prior work experience can serve as a proxy baseline variable within the labor market domain.

With that background, reviewers should consider two options for baseline equating:

1. The first approach reviewers should take is to assess equivalence using a pre-intervention (baseline) measure of the outcome used in the analysis. If a pre-intervention measure of the outcome used in the analysis is not available, then baseline equivalence must be established on a pre-intervention measure of a proxy variable from within the same domain as the outcome used in the analysis. For example, high school GPA or SAT/ACT scores might be used to establish baseline equivalence for an academic achievement outcome measured in the freshman year.
2. If neither a pre-intervention measure of the outcome nor a proxy measure from the same domain are available, then baseline equivalence must be established on both of the following:

- A continuously scaled pre-intervention measure of academic achievement. For example, high school GPA or SAT/ACT scores might be used to establish baseline equivalence.
- A pre-intervention measure of student socio-economic status (e.g., FAFSA expected family contribution, family income, high school free- or reduced-price lunch status, parent education levels, Pell grant eligibility) is acceptable for establishing baseline equivalence.

2. Baseline equivalence of clusters

Assessing equivalence of clusters

In general, considerations for satisfying baseline equivalence of individuals also apply to satisfying baseline equivalence of clusters. In particular, baseline equivalence of clusters in the intervention and comparison groups must be satisfied by using the same baseline measures listed above for assessing baseline equivalence of individuals, and the same statistical adjustment requirements apply.

Acceptable samples for demonstrating baseline equivalence of clusters

For this review, any of the following three samples can be used to satisfy the baseline equivalence requirement for the analytic sample of clusters (provided the data are representative of the individuals who were in the clusters at the time the baseline data were collected).

- (a) The analytic sample of the same individuals from any pre-intervention time period.
- (b) Individuals from the same cohort as the individuals in the analytic sample, within the same clusters. The baseline data may be obtained at the time that clusters were assigned to conditions or during the year prior to when clusters were assigned to conditions.
- (c) Individuals from the previous academic year cohort, in the same grade, and within the same clusters, as individuals in the analytic sample.

If authors provide baseline information at multiple time periods, a reviewer should assess baseline equivalence using the information collected at the latest period prior to the start of the intervention. If authors provide baseline information for multiple samples, a reviewer should assess baseline equivalence using the sample listed first in the list above—that is, (a) should be used if available, then (b), and then (c). If authors provide baseline information for multiple samples across multiple time periods, the reviewer should consult review team leadership to determine which information to prioritize.

When a study examines the effectiveness of an intervention in multiple time periods, the sample used to satisfy baseline equivalence of clusters in the base period (for example, the school year after random assignment) also satisfies baseline equivalence of clusters in the later time periods (for example, 2 years after random assignment), so long as the outcome data are representative of the individuals in the clusters.

Statistical Adjustments

The *WWC Procedures Handbook* discusses the types of adjustments made by the WWC in Section VI: Reporting on Findings. For “mismatched” analysis (that is, when a study assigns units at the cluster level but conducts analysis at the individual level), this topic area uses the WWC default intra-class correlation coefficients of 0.20 for all student achievement outcomes and 0.10 for all behavior outcomes, unless a study-reported intra-class correlation coefficient is available.

PROCEDURES FOR CONDUCTING THE LITERATURE SEARCH

The *WWC Procedures Handbook, version 4.0*, discusses the procedures for conducting a literature search in Section III: Identifying Relevant Literature and Appendix B: Policies for Searching Studies for Review. For the transition to college topic area, a broad search will be conducted to identify potentially relevant intervention studies, using the search terms identified in Exhibit 1. Content experts will also be asked to identify and recommend interventions with a large body of causal evidence likely to be of interest to decision makers.

The review team will also search the WWC database of previously reviewed studies to identify studies that have met standards in prior reviews. Those studies will be re-reviewed using the eligibility criteria and evidence standards described in this protocol. The team will also identify studies that have been rated as ineligible in prior reviews and will confirm that they are ineligible for this review based on the criteria described in this protocol.

Exhibit 1: Search Terms Used for the Initial Electronic Search

<p>“control group*” or random OR "comparison group*" OR "regression discontinuity" OR "matched group*" OR baseline OR treatment OR experiment OR intervention OR evaluation OR impact OR effectiveness OR causal OR posttest or post-test OR pretest or pre-test OR QED OR RCT OR "propensity score matching" or randomized or quasi- experiment*</p>	<p>AND</p>	<p>“financial aid” or “college admission*” or “college prep*” or “College plan*” or “college choice” or “college readiness” or “college counsel*” or “Federal student aid” or “college access” or “transition* from high school” or “Transition* to college” or “access to college*” or “educational advancement” or “ready for college” or “readiness for college” or “college ready” or “FAFSA” or “Pathway* to college” or “barrier* to college” or “postsecondary transition*” or “financing college” or “college knowledge” or “college pathway*” or “college pipeline” or “step* to college</p>
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After identifying relevant interventions, the next step is to conduct intervention-specific literature searches, using the intervention name, to identify all publications on each intervention. This review may include additional search terms. The WWC will also supplement the intervention-specific electronic database search with targeted searches of government and non-government agency websites, relevant non-profit organizations that might fund research on transition to college

interventions, and via reviewing the bibliographies of literature reviews, meta-analyses, and primary studies of the intervention under review.

In the final step, each citation gathered through this search process will undergo a screening process to determine whether the study meets the eligibility criteria established in the review protocol. This screening process is described in Chapter IV of the *WWC Procedures Handbook*. Finally, the interventions are prioritized for review based on the quantity and quality of eligible studies of the intervention. This prioritization process is described in Appendix A of the *WWC Procedures Handbook*.

Additional Sources

Literature reviews for this topic area involve searching the websites and electronic databases listed in Appendix B of the *WWC Procedures Handbook* as well as the following websites:

- Abt Associates
- American Educational Research Association (AERA)
- American Evaluation Association (AEA)
- American Federation of Teachers (AFT)
- Association for Public Policy Analysis and Management (APPAM)
- Center for Data-Driven Reform in Education (CDDRE) at Johns Hopkins University
- Center for Research in Educational Policy (CREP)
- Center for the Study of Higher Education at Berkeley (CSHE)
- Center on Education Policy
- College & Career Readiness & Success Center
- Community College Research Center (CCRC)
- Consortium for Policy Research in Education (CPRE)
- Cornell Higher Education Research Institute working papers
- Iowa Reading Research Center
- Mathematica
- MDRC
- National Bureau of Economic Research (NBER)
- National Center for Postsecondary Research
- National Center for Postsecondary Improvement
- National Education Association (NEA)
- Pacific Resources for Education and Learning (PREL)
- Public Policy Research Institute at Texas A&M University
- RAND
- Society for Research on Educational Effectiveness (SREE)
- Stanford Center for Education Policy Analysis (CEPA)
- WISCAPE working papers

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