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Introduction

Our team has three parts: Our experienced principal investigator (PI) and implementation team at University of Southern California (USC), our experienced independent evaluators at Summitlab Corporation (Summitlab) and the American Institutes for Research (AIR), and our education partners—the Nevada Department of Education (NDE) and 13 of Nevada’s 17 local education agencies (LEAs) serving 86% of Nevada’s school children. Our team has a successful track record of collaboration and enthusiastic letters of support from each of the county school districts in these LEAs (Churchill, Clark, Elko, Esmeralda, Eureka, Humboldt, Lander, Lincoln, Lyon, Nye, Storey, Washoe, and White Pine), highlighting the depth and breadth of enthusiasm for our proposal. Together, we propose a mid-phase grant to implement, test, and further refine a strategy to scale the *Pathways-to-Success (Pathways)* intervention in 72 urban, suburban and rural schools in Nevada. *Pathways* is a brief, whole classroom 12-session universal social-psychological intervention that helps 8th-grade students navigate the risky transition to high school. *Pathways* works by changing key elements of students’ identity-based motivation (IBM): their possible selves (who they expect to become in the near and distant future), their strategies to work on these possible selves, and how they interpret difficulties along the way. In doing so, *Pathways* helps students see school as the path to their future self, feel an urgency to start now and develop strategies to persevere, handle setbacks, and prevent failure.

Pathways is a teacher-led model of the trainer-led School-to-Jobs (STJ) intervention. It is implemented in brief (30-45 minutes on average) twice weekly sessions during the first six weeks of the school year in homeroom, advisory, or an elective period of each school’s choosing. STJ was rigorously tested with an NIH-funded randomized controlled trial (RCT) in Detroit, Michigan. The RCT documented significant and remarkable impacts on student self-regulatory

behaviors (attendance, time spent on homework, initiative, disruptive behavior) and academic outcomes—grade point average (GPA), test scores, and retention (Oyserman, Bybee, & Terry, 2006). End-of-8th-grade effects persisted when examined at the end of 9th-grade, a critical window for dropout prevention. RCT results revealed support for the IBM theoretical framework: Effects on academic outcomes were mediated by changes in the core “active ingredients” of IBM.

PI Oyserman then collaborated with 8th-grade teachers in 10 Chicago schools and co-PI Sorensen (independent evaluator) in a 3-cycle rapid development grant. Funded by the U.S. Department of Education’s Institute of Education Sciences (IES), we carefully assessed fidelity and iteratively developed a strategy to scale to address barriers to feasibility, scalability and sustainability in four ways. (1) *Teacher-led*: Teachers, rather than external trainers, lead *Pathways*, enhancing scalability. Once trained, a teacher can lead *Pathways* with each successive cohort of their 8th-grade students. (2) *Infrastructure for scaling*: A local/regional team of teachers who previously implemented with the highest fidelity is selected to become teacher trainers to help train future teachers. (3) *Sustainability*: We provide reusable implementation materials. (4) *High-quality supports for implementation*: Supports include an enhanced, graphically rich implementation manual and teacher-trainer manual, video of high-quality *Pathways* implementation, PowerPoint for structured delivery, and video tips from teacher trainers—all easily accessible on a central website designed for high-volume traffic. These implementation supports facilitate the translation of knowledge and experience from training into high-fidelity implementation in the classroom with students.

The primary objective of this mid-phase grant is to continue refining our scaling and sustainability strategy (USC) in diverse educational settings serving high-need students while

conducting a large-scale, rigorous independent impact evaluation (Summitlab/AIR). To facilitate iterative refinement and scaling strategy optimization, we will implement *Pathways* in a total of 72 schools (34 urban/suburban, 38 rural) across four school years (SY) in 13 of Nevada’s 17 LEAs (see Project Design B.1.1). We estimate that we will train 432 8th-grade teachers and 72 counselors, and that *Pathways* will reach more than 13,000 8th-grade students during the first year of implementation at each school (more than 43,000 across the grant). Our rollout structure allows us (USC) to continuously improve our strategy to scale. Each year we will revise resources and refine the model for future implementations based on feedback from teachers and trainers and quantitative analyses of fidelity, survey responses, and website analytics. Our evaluation is designed to examine policy-relevant impacts across grades 8 and 9 for students in three evaluation cohorts—see B.1.1 (Project Design) and Section E (Evaluation) for details.

Absolute Priorities

We address **Absolute Priority 1—Moderate Evidence** by further scaling and testing *Pathways*, an intervention that meets the moderate evidence criterion in two ways. First, *Pathways* addresses Recommendation 3 of the latest edition of the What Works Clearinghouse (WWC) practice guide, *Preventing Dropout in Secondary Schools*, which is to “engage students by offering curricula and programs that connect schoolwork with college and career success and that improve students’ capacity to manage challenges in and out of school” (Rumberger et al., 2017). Following a synthesis of existing knowledge by a WWC expert review panel, ***Recommendation 3 is the only recommendation backed by strong evidence.*** The *Pathways* curriculum and program addresses this recommendation by helping students identify school as the path to their own career success, articulate images of what that success would look like, link those future images of themselves as adults into next-year possible selves, develop timelines linking these future selves to the present—identifying obstacles and choice points along the way,

develop strategies and action plans that situate strategies in time and place to create effective habits and routines for success, and by guiding to students to make productive interpretations of difficulty in school—so that difficulty signals that “this is important for me”—reason to work harder—and not “this is impossible for me”—reason do disengage and focus elsewhere.

Second, the former trainer-led model of *Pathways* was tested rigorously with an RCT that meets WWC evidence standards without reservations (Oyserman, et al., 2006, see Evidence Form). The RCT found statistically significant positive impacts and no negative impacts on short-term (end of 8th-grade) outcomes (e.g., increased attendance, core course performance, test scores, and initiative; decreased grade retention and teacher-reported disruptive behavior). Effects persisted or grew larger by the end of 9th grade, as detailed in subsequent sections. Oyserman and colleagues followed up with numerous experimental studies validating components of the underlying theoretical framework. These provide evidence that eliciting the active ingredients of IBM results in increased self-regulatory behaviors and task performance.

We also address **Absolute Priority 3—Field-initiated innovations—fostering knowledge and promoting the development of skills that prepare students to be informed, thoughtful, and productive individuals and citizens** in two ways. First, we will implement, replicate, and scale *Pathways*, an evidence-based intervention to support attainment for high-need students: 8th-grade students enrolled in Nevada public schools, a high-need educational context in terms of high dropout rates, proficiency rates, free/reduced priced lunch (FRPL) and minority enrollment rates, and percentage of rural and Title I eligible schools. Second, we will improve student academic performance and better prepare students for employment, responsible citizenship and fulfilling lives by helping students in high-need contexts forge more meaningful relationships with teachers and peers, develop perseverance through productive interpretations of difficulty

and improved skills to anticipate, problem-solve and overcome obstacles, achieve expected future selves through increased academic success, and increase self-regulation (increased attendance and initiative in school, decrease disruptive behavior) to achieve long-term goals.

A. Significance

A.1. Increasing Knowledge of Effective Strategies to Help Students Persevere in the Face of Difficulty, Succeed Academically, and Prevent Dropout

A high school diploma is a critical defense against poverty (Phillips, 2019). When compared with graduating peers, students who drop out of high school are more likely to be unemployed or underemployed, live in poverty, have poor health, and become involved in criminal activities (Belfield & Levin, 2007; Christle, Jolivette, & Nelson, 2007; Hayes, Nelson, Tabin, Pearson, & Worthy, 2002). Compared to students who drop out, high school graduates earn \$260,000 to \$550,000 more over their working lives (see Belfield & Levin, 2007). Dropouts cost taxpayers over \$290,000 more than high school graduates due to lower tax revenues, higher cash and in-kind transfer costs, and costs of incarceration (Sum et al., 2009).

Across the socioeconomic spectrum and across urban, suburban and rural settings, children and parents value educational attainment and expect to complete high school and college. Even students who drop out do not plan to fail, they likely had college-bound future identities (for reviews, Oyserman, 2012; Oyserman & Lewis, 2017). Hence, intervening to help students keep this future in mind, connect it to current strategies, and interpret difficulties along the way as implying that school is important (not impossible) improves self-regulatory behaviors and performance in school (Oyserman et al., 2006). **The middle school years offer a critical intervention point at which dropout can be addressed.** Attendance and course failure/performance in 9th grade (Allensworth, 2005, 2007) and in middle school (Balfanz, Herzong, & MacIver, 2007; Neild,

Balfanz, & Herzog, 2007) reliably identifies which students are at risk of not graduating from high school. School failure and dropout happen for many reasons but are usually a cumulative process of increased disengagement with school (Fine, 1991; Orfield et al., 2004). This cumulative disengagement rarely results from students' diminished desire to do well academically but rather from a failure to connect long-term future goals to immediate academic performance and invest appropriate self-regulatory effort (Oyserman, 2012, 2015). **Middle school intervention that makes the future feel close by focusing students on their future selves and school feel like the path to get there has been shown to improve academic outcomes and reduce disengagement** (Oyserman, 2012, 2015).

IBM theory predicts that small changes in how students make meaning of school can have large effects on their risk of academic disengagement and failure if intervention makes the present feel connected to the future so that one's future self is experienced as relevant to the present and difficulty with schoolwork is interpreted as signaling the importance of school (Oyserman, 2007, 2009, 2015; Oyserman et al., 2017). IBM theory has three premises. The first is that people prefer to act and make sense of their experiences in identity-congruent ways. The second is that identities feel stable but are sensitive to cues as to which identities are relevant and what these identities imply for meaning making and action. The third is that brief intervention can shape which identities come to mind, what these identities imply for behavior, and how difficulty is interpreted (e.g., "this is important to me," "this is impossible for me").

Social psychological experiments have tested and validated all three premises of the model. Students guided to interpret difficulty as a signal that a task is important see school as more central to their current (Smith & Oyserman, 2015) and future possible selves (Oyserman et al., 2018). They identify more strategies to attain these future selves (Oyserman et al., 2018), spend

more time on school tasks (Smith & Oyserman, 2015), and outperform those who see difficulty as a signal that a task is impossible (Elmore et al., 2016; Oyserman et al., 2018). Having strategies to work on one's academic possible selves predicts school grades (Oyserman, et al., 2004), and test scores (Bi & Oyserman, 2015), including among low income and rural children; but without intervention these students are less likely to link action strategies to school-focused possible selves (Oyserman, et al., 2011). In addition, discriminate validity analyses show that interpretation of difficulty as a motivational force is distinct from other related constructs such as efficacy ("If I try, then I can succeed"), growth mindset ("If I try, then I can change"), grit ("I am the kind of person who keeps trying"), and locus of control ("Whether or not I succeed is in my own control") (Fisher & Oyserman, 2017). Rather than answering a question of whether trying will work, interpretation of difficulty as importance answers the question: "Why should I try?"

Our examination of the literature suggests that available social-behavioral programs often do not provide evidence that they have positive impact on academic outcomes; or if they do, they often do not provide experimental evidence or fail to explicitly test the underlying process model (for a meta-analytic review, see Durlak et al., 2011; for a summative review, see Snipes et al., 2012). Complex, multicomponent, or lengthy programs pose usability and feasibility obstacles that limit their scalability and staying power (Durlak & DuPre, 2008). Though underlying theoretical rationales for interventions differ, none test the underlying process model directly except *Pathways* (Oyserman et al., 2006). Lack of evidence from randomization, lack of clear theoretical rationale, and lack of testing of the theorized process model all limit scalability since they do not provide a basis to determine which elements of the program constitute active ingredients or how particular activities can be modified to fit differences in age, culture, and other contextual features. A final limitation of existing research and practice is a lack of detailed

intervention manuals, usability enhancing checklists, and fidelity protocols. Without these, it is impossible to know what people actually did, undermining replication efforts. For example, within Durlak's (2011) meta-analytic review, although Flay et al. (2001) report that their intervention includes curricular material, only Ialongo et al. (1999) and Oyserman et al. (2006) described detailed intervention manuals with outlines and checklists, including the specific themes that need to be covered to ensure fidelity of intervention.

Summary. The consequences of dropout are dire and the middle school years offer a critical intervention point for addressing academic disengagement. Intervention that makes the future feel close by focusing students on their future selves and school feel like the path to get there has been shown to improve academic outcomes and reduce disengagement. However, too few social-behavioral programs have adequately tested their underlying theoretical framework or adequately manualized intervention activities and fidelity protocols to facilitate scalable implementation in culturally diverse, resource-limited contexts. Moreover, educators need brief, effective, scalable and sustainable interventions that they can easily implement in the classroom. *Pathways* is an exceptional intervention to address these challenges given a strong evidence base demonstrating impacts on critical outcomes and empirical support for the underlying process. In addition, *Pathways* has undergone extensive usability/feasibility testing in partnership with teachers and is ready for continued scaling and testing in diverse settings.

B. Quality of Project Design

B.1. Project Design to Address the Needs of Nevada Students and Schools

Nevada's graduation rate of 83% means that nearly 84,000 Nevadans leave high school without a diploma each year, and only 61% go on to enroll in college, lower than the national

average of 69%.¹ Nevada ranks 35th of 50 states in high school graduation rate and 2nd in its rate of young adults without a high school diploma (McFarland, Cui, Holmes, & Wang, 2020). Dropout rates in Nevada are more than double for Hispanic (13%) and Black (12%) students relative to their White peers (6%). Education indices consistently rank Nevada near bottom—48th in EdWeek’s 2019 Report Card for States and 50th in U.S. News and World Report’s PK-12 education rankings. Statewide proficiency rates are also dismal (33% and 49% proficiency in math and English/Language Arts, respectively). Most of Nevada’s schools (58%) are Title 1 eligible and predominantly serve socioeconomically and ethnically disadvantaged students. Most of Nevada’s students (68%) are students of color (42% Hispanic, 11% Black, 7% multiracial, 7% Asian/Pacific Islander, 1% American Indian/Alaskan Native) and over 60% are FRPL eligible. Ensuring equitable educational opportunities is uniquely difficult in Nevada due to its makeup of 2 large urban and 15 small rural districts (based on locale designations for EIR purposes), which serve the most diverse rural population in the U.S. with the highest rural student mobility rates (Valley, 2019). In 2019, the Rural School and Community Trust (Showalter et al., 2019) found that Nevada’s rural students are the least college-ready of rural students nationwide, making it urgent for Nevada policymakers to address the needs of schools serving rural students.

The challenges in Nevada are exacerbated by the COVID-19 pandemic. Prior to the pandemic, Nevada’s unemployment rate was 3.6%, an all-time low. By mid-May unemployment was 30%—an economic downturn projected to take years to recover as Nevada’s economy has been the hardest hit by COVID-19 according to 24/7 Wall St’s index of economic impacts from the Economic Policy Institute. As demonstrated by letters of support, there is a high need for

¹ Based on the national adjusted cohort graduation rate (ACGR).

Pathways to address these challenges. Our partners serve 86% of Nevada students and mirror state averages on demographic and attainment characteristics (see Exhibit I-1 in Appendix I).

B.1.1 Project Design

LEAs already had initial conversations with schools. At the outset of the grant in January 2021, Summitlab/AIR will shift to formal outreach with principals, 8th-grade teachers, and counselors in partnering LEAs, drawing on our successful strategies in similar prior large-scale evaluations. Summitlab/AIR will employ a mix of successful field-tested recruitment strategies to capture the attention of school leaders and obtain school engagement. These include mailing principals of eligible schools a “gift bag” of printed and tangible branded project promotional materials followed by field-tested communication (email, phone calls) to schedule in-person or virtual meetings with school leaders, 8th-grade teachers, and counselors. Following meetings, we will collect signed consent forms from participants schools prior to random assignment.

The team will recruit 72 schools (34 urban/suburban, 38 rural) serving 8th-grade students (12 Cohort 1 schools in Year 1, 30 Cohort 2 schools in Year 2, 30 Cohort 3 schools in Year 3). Schools in each cohort will be randomly assigned to receive training and implement in the coming school year (treatment) or one year later (delayed treatment). We will prioritize selection of schools in districts with lower graduation rates and/or serving a higher proportion of students FRPL eligible. Each summer, USC will train 8th-grade teachers and counselors to implement in the coming fall, supported by weekly check-ins—including 6 Cohort 1 treatment schools implementing in SY 21–22, 15 Cohort 2 treatment/6 Cohort 1 delayed-treatment schools implementing in SY 22–23, 15 Cohort 3 treatment/15 Cohort 2 delayed-treatment schools implementing in SY 23–24, and 15 Cohort 3 delayed-treatment schools implementing in SY 24–25). Assuming schools continue implementing once trained, *Pathways* will be implemented with

more than 43,000 8th graders. Based on a simulated random sample of schools from our Nevada LEAs, we anticipate training an average of 6 teachers and 1 counselor per school. Following implementation in SY 21-22, we will identify a first group of teacher-trainers (based on high-fidelity implementation) to support teacher trainings in Year 2, as well as a second and third group of trainers following SYs 22-23 and 23-24 for trainings in Years 3 and 4 respectively.

B.2. Measurable Goals, Objectives, and Outcomes

Exhibit 1 specifies each goal, linked objective, planned outcome, and measure for the project.

Exhibit 1. Objectives, Strategies, Outcomes, and Measures

Objectives	Outcome	Measures
Goal 1. Maximize impacts on student outcomes (identity-based motivation, self-regulatory behaviors, social and emotional competencies and well-being, and academic outcomes) by implementing <i>Pathways</i> with fidelity.		
Obj 1.1. Teachers implement <i>Pathways</i> as a universal intervention with 8 th grade students at the start of the school year.	At the start of the school year, 8 th grade teachers implement the 12 sessions and activities with all 8 th grade students (dosage).	Measure 1.1. Based on video-recorded observations for each treatment teacher (who provides video recordings), 90% of teachers implement all 12 sessions within the first 10 weeks of the school year and attempt to implement 80% or more of all activities—based on analyses of 6 coded observations for each teacher using a structured activity checklist for each session (see Appendix I).
Obj 1.2. Teachers implement <i>Pathways</i> sessions and activities as intended.	Teachers implement <i>Pathways</i> sessions and activities as described and sequenced in the implementation manual (adherence).	Measure 1.2. Based on analyses of 6 video-recorded observations for each treatment teacher, 75% of teachers will implement <i>Pathways</i> sessions with moderate or higher adherence (60% or above) using established valid and reliable adherence checklist for each session of teacher actions (see Appendix I).
Obj 1.3. Teachers provide quality implementation of <i>Pathways</i> sessions and activities.	Teachers implement <i>Pathways</i> sessions and activities with high-quality instruction, clear and consistent delivery of core concepts connected to student-generated examples, fluency (pace, repetition and clarity converge to create a sense that the take-home point must be true), and a positive classroom climate (quality).	Measure 1.3. Based on analyses of 6 coded video-observations for each treatment teacher, 75% of teachers will implement <i>Pathways</i> sessions with moderate or higher quality (60% or above) using established valid and reliable video-coding rubrics for instructional quality, delivery of take-home points, fluency and student-report of teacher sensitivity, and classroom climate (see Appendix I).
Obj 1.4. Students actively engage in <i>Pathways</i> activities.	Students respond to <i>Pathways</i> sessions and activities as intended with high engagement (responsiveness).	Measure 1.4. Based on analyses of 6 coded video-observations for each treatment teacher, 75% of teachers will implement <i>Pathways</i> sessions with moderate or higher student responsiveness (60% or above) using established valid and reliable checklist for student behaviors for each activity and observer-rated student engagement (see Appendix I).
Obj 1.5. Students develop the skills	Students demonstrate the skills highlighted across <i>Pathways</i> sessions	Measure 1.5. Based on analyses of established valid and reliable student self-report measure at the end of

highlighted in each session/activity.	and endorse the identity-based motivation messages regarding strategy development and interpretation of difficulty (receipt).	<i>Pathways</i> sessions, 75% of students will report being confident or very confident that they could demonstrate the skills highlighted in each session and agree or strongly agree with core identity-based motivation messages related to strategy development and interpretation of difficulty (see Appendix I).
Goal 2. Implement and continuously refine <i>Pathways</i> strategy to scale using participant feedback and implementation data		
Obj 2.1. Train teachers in participating schools to implement <i>Pathways</i> .	Teachers participate in a 3-day training to (1) experience <i>Pathways</i> as a participant, (2) learn the supporting research, and (3) practice implementation with coaching.	Measure 2.1. Based on attendance records from the training sessions, 95% of 8 th grade teachers attend all three days of training, and at least one guidance counselor or other designated staff member from 75% of participating schools attend all days of training.
Obj 2.2. Provide resources to support preparation for and high-quality implementation of <i>Pathways</i> .	At training, provide each teacher a printed <i>Pathways</i> implementation manual, and ensure that all teachers successfully log on to the website containing all implementation materials including the video resource library.	Measure 2.2. Confirmed receipt of printed manuals for 100% of teachers and counselors who attend training, and based on website analytics records, at least 90% of trained teachers access the program website during training.
Obj 2.3. Provide sustainable materials to support <i>Pathways</i> implementation.	Prior to the start of the school year, each implementing classroom receives <i>Pathways</i> implementation materials including consumable (photocopies) and non-consumable materials for each classroom.	Measure 2.3. Confirmed receipt of 100% of shipments.
Obj 2.4. Monitor and support teachers through weekly check-in meetings during implementation.	Teachers receive timely support from trainers/coaches that addresses their needs.	Measure 2.4. 75% or greater attendance in weekly support calls, based on attendance records and 75% of or more teachers who attend weekly calls report that they found them at least moderately useful.
Obj 2.5. Collect and analyze implementation and participant feedback data.	Collect data from 4 sources: (1) training feedback surveys, (2) teacher implementation feedback survey, (3) student feedback survey on their participation experience, and (4) video recordings of <i>Pathways</i> sessions for implementation fidelity.	Measure 2.5.a. 75% or higher response rate on training feedback surveys Measure 2.5.b. 75% or higher response rate on teacher implementation surveys Measure 2.5.c. 75% or higher response rate on student feedback surveys Measure 2.5.d. Successful video recordings (usable audio/video) for 75% of all sessions from 75% of implementing teachers. Measure 2.5.e. Successful video-coding and analysis of 100% of 6 randomly selected videos for each teacher who provided videos using established rubrics (see Appendix I), with 80% or higher interrater agreement between independent coders.
Obj 2.6. Share implementation findings for continuous improvement.	USC receives clear, concise recommendations from implementation data and participating feedback to inform ongoing refinements to materials and the strategy to scale.	Measure 2.6. Project team prepares a memo summarizing implementation findings to be used for refinements following each year of implementation.
Obj 2.7. Refine strategy to scale based on	Refine program materials and elements of strategy to scale as	Measure 2.7. Project team prepares a memo documenting all changes made to materials and the

implementation and feedback data.	needed based on participant feedback and implementation fidelity data.	strategy to scale based on implementation and feedback data each year.
Goal 3. Conduct an RCT that meets What Works Clearinghouse (WWC) standards without reservation to test the impact of <i>Pathways</i> on student outcomes in grades 8 and 9 and disseminate findings to diverse stakeholders.		
Obj 3.1. Identify 72 interested schools to participate and confirm participation.	Teachers and counselors from all schools review recruitment and outreach materials and/or meet with the recruitment team and sign consent forms.	Measure 3.1. Conduct virtual or in-person site visits with 100% of participating schools and receive signed consent forms from 8 th grade teachers and/or counselors from 100% of participating schools prior to random assignment.
Obj 3.2. Randomly assign schools to treatment or delayed treatment condition.	Produce two equivalent samples of treatment and delayed treatment schools and students.	Measure 3.2. Analyses of student administrative records will confirm that the school-level random assignment procedure produced two statistically equivalent groups of schools with standardized mean differences less than 0.25, per WWC standards.
Obj 3.3. Analyze implementation fidelity data.	Classify all implementing classrooms and schools (as an aggregate of classrooms) as low, moderate or high implementers.	Measure 3.3. A random sample of six <i>Pathways</i> video-record observations for each teacher/classroom that provided data will be coded and analyzed using established valid and reliable measures, and classified overall as low (below 50%), moderate (60-70%) or high implementers (greater than 70%) using cut points established based on prior research.
Obj 3.4. Assess impacts of <i>Pathways</i> on student outcomes.	Analyze data on outcome measures collected through administrative records and surveys.	Measure 3.4. Using student-level administrative and survey data, complete impact analyses of all proposed student outcomes in Grades 8 and 9 for 100% of participating schools using analytic procedures that meet WWC standards without reservations.
Obj 3.5. Conduct a cost analysis of <i>Pathways</i> .	Produce estimates of per-student costs for implementing <i>Pathways</i> .	Measure 3.5. Complete analysis of cost using internal program data for 100% of participating schools, and feedback on unanticipated costs from implementation feedback surveys from teachers/schools that complete the survey. If <i>Pathways</i> has the expected impact on student outcomes, calculate the cost effectiveness of program participation per-pupil.
Obj 3.6. Disseminate findings.	Information about the study and its impacts is disseminated through peer-reviewed journal articles, non-technical briefs for educators, news outlets and conference presentations.	Measure 3.6.a. At least three publications submitted to relevant journals. Measure 3.6.b. At least five paper presentations submitted for professional conferences.
Goal 4. Develop a network and infrastructure of teacher trainers for continued scaling of <i>Pathways</i>.		
Obj 4.1. Identify teachers to become trainers.	A group of interested teachers implementing <i>Pathways</i> with high fidelity is identified to become qualified trainers in Nevada.	Measure 4.1.a. At least 8 teachers (no fewer than 1 in Year 2, 4 in Year 3, and 3 in Year 4) who implemented with high fidelity will be selected based on fidelity of implementation data.
Obj 4.2 Train teacher trainers.	Selected teachers are trained to be <i>Pathways</i> trainers.	Measure 4.2., At least 8 teachers (no fewer than 1 in Year 2, 4 in Year 3, and 3 in Year 4) are trained as <i>Pathways</i> trainers.
Obj 4.3. Teacher trainers train new teachers.	Teacher trainers co-lead trainings for future cohorts of teachers.	Measure 4.3. At least 8 teacher trainers (no fewer than 1 in Year 2, 4 in Year 3, and 3 in Year 4) co-lead at least one teacher-training and lead at least one series of 6 weekly check-in calls with implementing teachers.

Obj 4.4. Create online network for <i>Pathways</i> trainers and implementing teachers.	An online discussion board is added to the <i>Pathways</i> website to bring together the community of <i>Pathways</i> users and trainers in Nevada.	Measure 4.4. Based on website analytics, at least 50 unique visitors to <i>Pathways</i> discussion board.
Obj 4.5. Debrief with NDE and districts about sustainability.	USC and NDE identify potential facilitators and barriers to scaling and sustaining <i>Pathways</i> statewide and develop plan for ongoing use.	Measure 4.5. Based on feedback from participating schools, districts, and teacher trainers, USC and NDE document plan to support long-term sustainability.

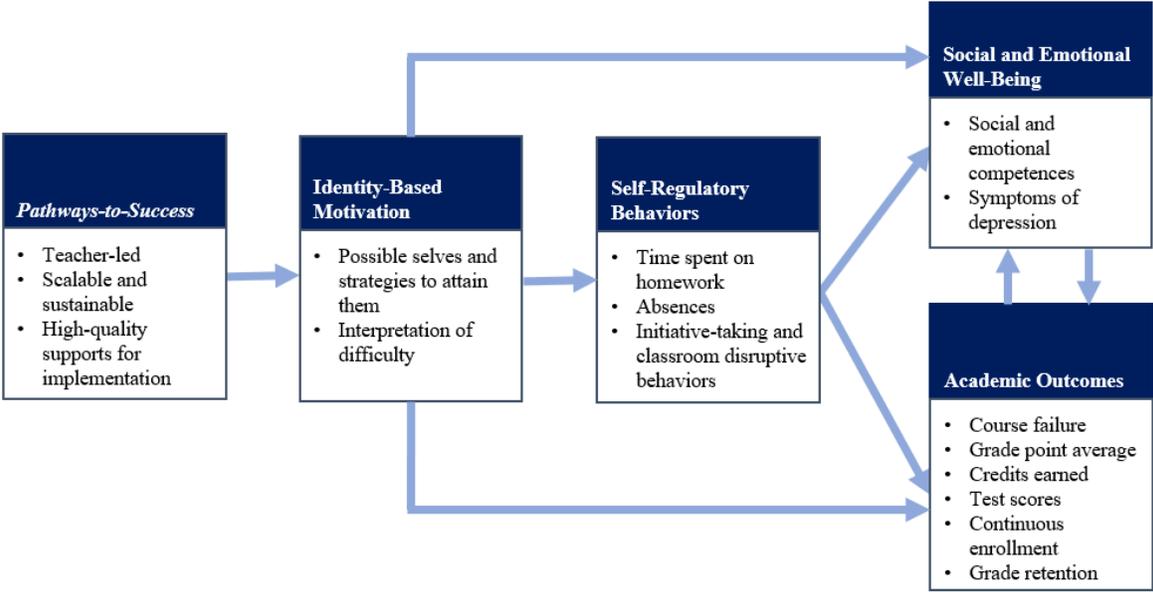
Note: In addition to teachers, guidance counselors and/or other designated school staff or community members (designated by districts or schools) may also be trained to implement *Pathways* (and become trainers). For brevity, we use “teachers” to represent these potential trainees/implementers in the table.

B.3. Coherent, Sustained Program of Research and Development in the Field

The *Pathways* intervention is exceptional in that it is rooted in extensive research testing the active ingredients—the core components of IBM summarized in Section A.1.—and that *Pathways* has been rigorously outcome and process tested. *Pathways* operationalizes the active ingredients of IBM theory in 12 small-group activities. Each session has a take-home point; core points are reinforced across sessions; activities are simple and seemingly “easy,” structured to engage active, student-led learning (See Appendix I.2 for session descriptions). *Pathways* is supported by the strong theoretical framework and underlying process model shown in Exhibit 3.

Our theory of change predicts that *Pathways* activates core active ingredients of IBM for students (possible selves and strategies to attain them and interpretation of difficulty as important). IBM, in turn, facilitates self-regulatory behaviors (time spent on homework, attendance, initiative/behavior in class) and improves social and emotional well-being (social and emotional competencies, symptoms of depression) and academic outcomes (course failures, GPA, credits earned, test scores, continuous enrollment, grade retention).

Exhibit 3. Pathways Theoretical Framework and Underlying Process Model



Empirical support for Pathways. Prior research (Oyserman et al., 2006) demonstrates that the active ingredients of IBM can be activated by *Pathways*, influencing self-regulatory behavior (doing homework, attending rather than cutting class, and engaging rather than disrupting others), and improving academic performance. Students who receive *Pathways* with fidelity finish the year with better social and emotional well-being (Oyserman, O’Donnell, Sorensen, Wingert, 2020). Affecting these outcomes matters, reviews of the literature demonstrate that they predict academic success (graduating high school, attending college) and later earnings better than standardized tests (Farrington et al., 2012).

As highlighted earlier, an RCT of the prior trainer-led *Pathways* intervention conducted in Detroit Public Schools with predominantly low-income Black and Hispanic 8th-graders (Oyserman et al., 2006) demonstrated substantial improvements in important self-regulatory behaviors (decreased unexcused absences [$d = -0.73$], increased time spent doing homework [$d = 0.24$], increased teacher-reported initiative in classroom [$d = 0.17$]; decreased teacher-reported disruptive behaviors [$d = -0.21$]) and key academic outcomes (core subject GPA, test scores,

retention). These significant effects persisted or grew larger across the transition to high school two years after the intervention (end of 9th grade). For example, at the end of the first-year follow-up, fewer than half as many intervention youths as control youths were retained in 8th grade and *Pathways* demonstrated increased attendance, improved academic performance, and decreased symptoms of depression. By the end of the second year of follow-up, *Pathways* students spent almost 60% more time on homework each week than control students. Each semester, intervention youth averaged 2.25 more days in school than control youth, continuing the large intervention effect on attendance found at the end of the first year. A significant difference in GPA emerged by the third quarter ($d = 0.25$), two quarters after *Pathways*, and that effect grew through the end of 9th grade (see Oyserman et al., 2006). By the end of 9th grade, *Pathways* youth experienced significantly fewer symptoms of depression ($d=-0.25$). Results support the process model; *Pathways*' direct effect on academic performance was mediated by its effect on self-regulatory behavior and IBM core ingredients (Oyserman et al., 2006).

These results are promising because this brief intervention administered at the beginning of the 8th-grade year produced effects on critical predictors of on-time graduation (Allensworth & Easton, 2005, 2007); and effects were large enough to matter in real-world settings; for example, they completely buffered students from the negative effects of low parent involvement with school (Oyserman, Brickman, & Rhodes, 2007). **If effects from this prior study replicate in this mid-phase project, we can expect to observe a 60% increase in homework time; a 15% reduction in the number of students at risk of not graduating because of chronic absence, a 13% reduction in the number of students who are clinically depressed, a 60% reduction in the number of students retained, a 21% increase in cumulative GPA, and an 8% increase in the number of students attaining proficiency on state standardized tests.**

As highlighted earlier, PI Oyserman collaborated with 8th-grade teachers in Chicago and co-PI Sorensen (independent evaluator) to iteratively develop and test a strategy to scale to address barriers to feasibility, scalability and sustainability (see Section C). The strategy works; we assessed fidelity and its consequences (Horowitz, Yoder, Sorensen, & Oyserman, 2019; Oyserman, et al., 2020). Teachers can implement *Pathways* with moderate to high fidelity (60-80% average dosage, adherence, responsiveness, quality, and student receipt of intervention activities) paralleling mean fidelity in the prior RCT with external trainers which found positive impacts. Fidelity matters, higher teacher implementation fidelity predicts better academic and social-emotional outcomes by changing identity-based motivation.

This mid-phase grant will extend prior work by providing expanded infrastructure for scaling *Pathways* to urban, suburban and rural schools in Nevada. In doing so, it will take an important next step by testing and refining the scaling strategy in rural contexts. Students in rural communities often find it especially difficult to connect current school success to economic and career success as an adult. A rural (vs. nonrural) gap in educational expectations and attainment is visible early in high school and rural 10th graders have lower expected educational attainment (Molefe et al., 2017) and are less likely to enroll and persist in college than their nonrural counterparts (Pierson & Hanson, 2015; Howley et al., 2014). This grant will expand *Pathways* to support students in these underserved and often geographically isolated communities.

B.4. Efficiency in the Use of Resources to Improve Results

Our project involves efficient use of resources (e.g., time, money, staff) in four ways. First, in contrast to many lengthy social-behavioral programs that involve year-long curricula, *Pathways* is a brief 12-session intervention with a cumulative total of 6 to 9 hours of instructional time to achieve its impacts on students. Second, except for a limited number of photocopies, materials for implementing *Pathways* activities are sustainable and can be reused for many years at little-

to-no cost to resource-constrained districts and schools. Third, the website allows for easy and efficient access to all *Pathways* materials, minimizing teacher prep time. Fourth, *Pathways* reduces disruptive behavior in class, facilitating more efficient use of instructional time.

C. Strategy to Scale

C.1. Strategy to Scale That Addresses Past Barriers

Our strategy to scale addresses six barriers to scaling based on prior work in Detroit and Chicago. Barrier 1: the large number of outside trainers needed to implement *Pathways* at scale each year in the first six weeks of the school year would be cost prohibitive. Barrier 2: it is not financially or technically feasible for Oyserman to continuously train enough individuals each year to support scalable delivery. Barrier 3: it is not financially or technically feasible for materials to be consumable or require prep. Barrier 4: the implementation manual was not structured optimally to facilitate efficient prep and high-quality delivery for teachers working alone in their classrooms. Barrier 5: Training was not manualized. Barrier 6: delivery and prep supports were not provided. **USC identified specific strategies to address these barriers with feedback from teachers to optimize usability, feasibility, fidelity, and sustainability of implementation.** These strategies are expected facilitate impacts for students at scale.

C.1.1 A Teacher-Led Model with Counselor Backup for Scalable Implementation.

To address barrier 1, USC will implement a teacher-led model. Training teachers has four notable advantages: (1) once trained, teachers can lead *Pathways* with each successive cohort of their 8th-grade students; (2) teacher-led implementation adds no costs for districts and schools; (3) teachers can thread *Pathways* core concepts into everyday instruction throughout the school year, providing opportunity for greater impact; and (4) *Pathways* provides an opportunity for teachers to forge meaningful connections with students at the outset of the year. As noted earlier,

teachers can implement *Pathways* with moderate to high fidelity (paralleling implementation fidelity observed in the prior RCT with external trainers which found positive impacts) and find *Pathways* usable and feasible to implement in the classroom. In addition, following feedback from our development work in Chicago, we will train one counselor serving 8th-grade students from each school. This allows them to incorporate core *Pathways* messages in their work with students and provides an additional trained person who can step in to implement if a trained teacher becomes unavailable. Given NDE feedback regarding unique challenges in understaffed rural settings, this individual could be a community member or retired teacher.

All 8th-grade teachers and counselors will attend a three-day regionally hosted summer training so no participants will travel more than 150 miles each way. They will be compensated for their travel and time at competitive out-of-school time rates for Nevada educators. Training has three parts (experience, construct learning, practice). First, trainees experience *Pathways* as participants. Second, they learn about the theory of motivation and the empirical evidence underpinning *Pathways*. Third, they practice implementing *Pathways* with direct coaching. After training, they implement *Pathways* with weekly audio or video-based trainer-support to review core take-home points and prepare for upcoming sessions.

C.1.2. Teacher-Trainer/Coaching Infrastructure for Scaling and Sustainability. To address barrier 2, USC will support increased local/regional capacity for scaling and future trainings. As detailed in Section B.1.1., we select teachers who implement with the highest fidelity to become teacher-trainers and co-lead future trainings with PI Oyserman. After Year 3, we will have up to 16 and no fewer than 8 trainers. Trainers are compensated at competitive rates for 40 hours of training and prep to lead trainings and weekly check-ins, and associated travel.

C.1.3. Sustainable Implementation Materials. To address barrier 3, USC will provide teachers all materials to implement *Pathways* at no cost. We iteratively refined the materials for all activities with teacher feedback to minimize photocopies and ensure materials are reusable, resulting in little-to-no prep. **All student materials are available in both English and Spanish.**

C.1.4. Enhanced Supports for Teacher Prep, Training, and Implementation. To address barriers 4 to 6, we developed a graphically-rich implementation manual (see example session in Appendix I), accompanying manual for trainers, PowerPoint for structured delivery for teachers using this method, three types of video for each session (session, theory, and core point), and trainer prep videos. *Session* videos show session delivery to a diverse class with text layover to highlight quality of delivery; although full sessions are presented, the video is sped up so it can be viewed in 5–10 minutes, reducing prep time. *Theory* videos highlight session-relevant key elements of IBM. *Core point* videos highlight session take-home points and prep tips from teacher-trainers. Trainer prep mini-video clips (1–3 minutes each) articulate in clear, everyday language the underlying theory and how it relates to specific activities and points to reinforce.

C.2. Dissemination Mechanisms to Support Further Replication

Relevant research and all materials to support *Pathways* implementation are housed on a central website (www.pathwaysintervention.com), designed to support high-volume traffic. All resources are available for free. We have users establish an account so that we can track usage analytics. We know that many educators in a range of settings are using our materials to implement *Pathways*. Our primary goal now is to refine and test a scaling model to ensure high-quality training for teachers and intended impacts for students and schools. As her resume details, PI Oyserman is a nationally recognized expert on IBM and preventive interventions. She published nearly 200 papers testing the motivational framework underpinning *Pathways*,

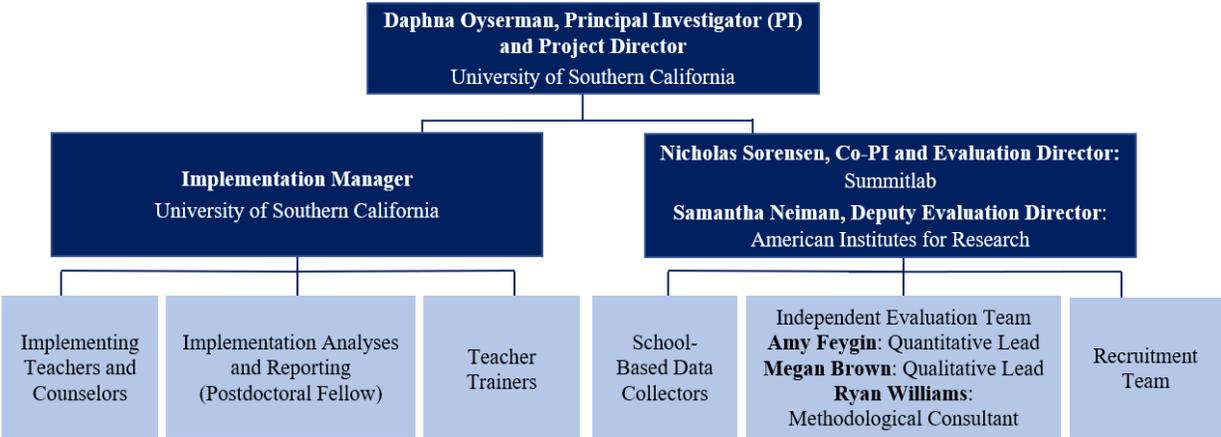
including high impact journal articles (nearly 30,000 Google Scholar citations). She frequently disseminates her findings in highly-read news articles and conference presentations. She and co-PI Sorensen have numerous collaborative publications with doctoral students.

D. Adequacy of Resources and Quality of Management Plan

D.1. A Management Plan Defining Responsibilities, Timelines, and Milestones

Our project management plan is designed to allow our partners to closely collaborate in clearly defined roles and with responsibilities linked to project milestones. Our team, led by USC, with partners Summitlab and AIR, has successfully collaborated to execute past projects. We preserve this structure to efficiently execute the proposed study. Each partner organization has strong capacity to accomplish their responsibilities and is well-suited to contribute to the success of the study. Using the reporting structure shown in Exhibit 4, we will accomplish each milestone in the project’s five-year timeline (see Exhibit I-3 in Appendix I).

Exhibit 4. Organizational Chart



USC, Summitlab, AIR and personnel (Exhibit 5) are well-qualified and prepared to bring this project to scale with extensive experience leading projects of similar size and scope. Under PI Oyserman’s leadership, USC will (1) oversee the subcontract to Summitlab, (2) report to OESE on grant performance, (3) lead implementation, including participant training and ongoing

support, (4) lead refinement of the strategy to scale, (5) lead implementation of the strategy to scale by identifying and training teacher trainers, and (6) disseminate implementation findings to practitioners, researchers, and the public via publications and conference presentations.

The independent evaluation will be led by co-PI Sorensen (Summitlab) with AIR support. With Sorensen’s direction, Summitlab will (1) oversee the AIR subcontract, (2) lead recruitment of schools to the RCT, (3) lead random assignment and determine baseline equivalence, (4) lead data collection activities (surveys, video recordings, and administrative data), (5) analyze implementation data to inform refining the strategy to scale, (5) lead impact and cost analyses, (6) report on the impact of *Pathways* to the U.S. Department of Education, and (7) disseminate study findings to practitioners, researchers, and the public via publications and presentations.

Exhibit 5. Key Personnel

<p>Daphna Oyserman, PhD—Principal Investigator and Project Director</p> <p>Dr. Oyserman will guide all implementation activities and refinement of the strategy to scale. Dr. Oyserman, Dean’s Professor of Psychology and Professor of Education, is the developer of <i>Pathway-to-Success</i> and is a nationally recognized expert in the field of motivational research. Oyserman has published dozens of journal articles on IBM and related topics and has iteratively refined <i>Pathways</i> to be usable, feasible, scalable, and sustainable for schools. A number of her papers have won research prizes and been cited as by the ISI Web of Science as high impact pieces in psychology. Oyserman has experience managing teams of researchers, she directed the NIH-funded Michigan Prevention Research training grant and co-directs USC’s Center for Mind and Society, which studies the influence of societal variables on individual cognition and behavior, people’s behavioral responses to the world they see, and how these two areas can be leveraged for intervention.</p>
<p>Nicholas Sorensen, PhD—co-Principal Investigator and Independent Evaluation Lead</p> <p>Dr. Sorensen is the executive director of Summitlab and will direct all evaluation activities. Following 15 years of conducting large-scale experimental field trials at the University of Michigan and AIR, he founded Summitlab in 2019 with the goal of helping program and intervention developers, administrators, and policymakers optimize, scale and test the impact of promising interventions, with a focus on leveraging social psychological theory to support the educational success of all children. His research is primarily focused on dropout prevention and helping struggling students succeed across the transition to high school. His work is published in referred journals, technical reports and policy briefs.</p>
<p>Samantha Neiman—Deputy Evaluation Lead</p> <p>Neiman is a principal researcher at AIR and will manage the AIR subcontract. Neiman has nearly 15 years of experience managing large-scale research projects, including two current ED-funded RCTs (one EIR Mid-Phase). Neiman has worked with the NDE and our LEA partners to manage the Nevada School Climate / Social Emotional Learning survey since 2015. Neiman earned her project management certification from Northwestern University.</p>
<p>Amy Feygin, PhD—Quantitative Lead</p> <p>Dr. Feygin is a senior researcher at AIR and will oversee quantitative data analyses. Dr. Feygin is an expert in college and career readiness for underserved youth, and currently serves as project director for an IES-funded systematic review of strategies to improve college completion rates, oversees Regional Educational Laboratory Midwest’s portfolio of applied research projects, and is a WWC certified reviewer.</p>
<p>Megan Brown—Qualitative Lead</p>

Brown is a senior researcher at AIR and will oversee qualitative data coding and analysis. Brown has 13 years of experience managing research projects at AIR, focusing on qualitative research design and classroom observation rubrics, and assisted USC in the development of the video coding rubrics to be used for this study.

Ryan Williams, PhD—Methodological Consultant and Quality Assurance Reviewer

Dr. Williams is a principal researcher at AIR with expertise in casual inference and meta-analysis. Dr. Williams has extensive training in quantitative methods focusing on contemporary measurement theory, meta-analysis, and experimental and quasi-experimental designs.

The management plan is designed to ensure that all project objectives are met on time and on budget, with project activities clearly defined and linked to project goals and objectives. Roles and responsibilities are clearly designated. As documented by our collaborative publications, our teams have worked together for over 10 years. We will build on our longstanding collaboration to maximize project efficiency. At project startup, PI Oyserman will convene project partners to establish clear expectations and lines of communication. To ensure that the project runs at maximum efficiency in all stages, we will keep a master timeline that illustrates interdependencies of activities within and across organizations, which will be maintained and updated by USC’s implementation project manager and used to facilitate bi-weekly cross-partner update meetings. Each partner will closely monitor their organization’s spending to ensure consistency with planned expenditures. Our team will meet at least twice monthly to review updates, adhere to timelines, identify challenges/solutions.

D.2. Capacity to Bring the Project to Scale

As one of the world’s leading private nonprofit research universities, with 2018 total revenues at \$4.9 billion, and research funding at \$516 million, USC supports interdisciplinary research collaborations that address societal needs and has the infrastructure and institutional resources to support this work. Oyserman has led or is currently leading three federally funded educational intervention RCTs. AIR has a track record of successfully executing school-based RCTs at scale and the recently completed projects described in Exhibit 6—4 of which were directed or codirected by Co-PI Sorensen (Summitlab) in his prior position at AIR.

Exhibit 6. Projects Conducted by Evaluation Partners

Project	Description	Funder	Number of Sites & States
Scaling and Testing an Effective Early Warning Intervention and Monitoring System (EWIMS)	Large multi-site efficacy study of EWIMS.	OESE (EIR Mid Phase)	120 schools in three states
Scaling and Sustaining My Teaching Partner-Secondary	Large multi-site efficacy study of the My Teaching Partner – Secondary instructional coaching program.	OESE (EIR Mid Phase)	23 schools in six states
Scaling and Testing of EWIMS	Large multi-site efficacy study of EWIMS	REL Midwest IES.	73 schools in three states
Scaling and Testing of ASSISTments	Large, multisite effectiveness study of <i>ASSISTments</i> , a web-based math homework program	IES	80 schools in five states
Scaling and Testing of Online Algebra for Eighth Graders	Large, multisite efficacy study of providing access to online Algebra I for eighth graders in rural schools.	REL Northeast and Islands (IES)	68 schools in two states
Scaling and Testing of Elementary Math PD	Large, multisite efficacy study of mathematics content PD program incorporating video feedback for teachers.	IES	73 schools in five states
Scaling and Testing of <i>Intensified Algebra</i>	Large, multisite efficacy study of <i>Intensified Algebra</i> —a blended, double-period algebra course for struggling students.	NSF	48 schools in five states

D.3. Potential for Continued Support, Sustainability, and Future Work

For the reasons we detail next, Nevada schools will likely continue scaling and sustaining *Pathways* after the grant. First, as demonstrated through their letters of support (Appendix C), *Pathways* is well-aligned to Nevada’s goals, facilitating the integration of *Pathways* into ongoing improvement efforts. Second, sustainability planning will be integrated into an annual feedback cycle with NDE. Each year, we will solicit feedback from teacher-trainers, implementing teachers, schools, and districts regarding potential facilitators and challenges to long-term sustainability, and will help NDE strategize to support its districts to mitigate potential barriers. Third, when the project ends in 2025, we will have scaled *Pathways* in roughly 35% of Nevada middle schools. This widespread implementation means that *Pathways* will have become a regular part of the 8th-grade student experience in most districts, a facilitator for sustainability. Fourth, our strategy to scale will result in a local/regional team of teachers qualified to train their

peers to implement *Pathways*, facilitating continued scaling of *Pathways* with minimal support. Fifth, we will have established a network on the *Pathways* website dedicated to connecting the Nevada community of users and trainers, which will be maintained beyond the grant period. Sixth, our dissemination efforts will extend beyond research as we will provide strategies to implement teacher-led social-behavioral intervention at scale in diverse and remote rural settings.

D.4. Reasonability of Cost in Relation to Project Objectives and Significance

Project cost is reasonable with respect to project objectives and significance. The average school in Nevada serves 187 8th-grade students, with the potential to serve 43,758 students over the grant period, assuming sustained implementation following training. The per-student project cost is therefore \$182.77. Of these 43,758 students, 7,439 are expected to drop out of high school (17%) and earn substantially less than their peers who earn a high school diploma, between \$260,000 and \$550,00 less in lifetime earnings (Belfield & Levin, 2007). If just an additional 1% of those 7,439 Nevada students persist to graduation, they will earn nearly \$20M more in combined lifetime earnings and will save taxpayers \$22M (e.g., in lower tax revenue), resulting in a more than five-fold return on investment from this project. This investment in *Pathways* in Nevada will serve as the basis for long-term use throughout the state, reaping continued value in the form of improved student outcomes and greater lifetime earnings long after the grant ends.

E. Quality of the Project Evaluation

Summitlab/AIR will conduct an independent evaluation to answer eight research questions (RQs) about *Pathways*' impact (RQs 1–4) and implementation (RQs 5–8) as shown in Exhibit 7. These research questions map onto the *Pathways* logic model (Exhibit 3). The evaluation is designed to assess impact and implementation of *Pathways* using the current strategy to scale. Individual sessions cannot be tested in isolation; they build on and reinforce one another.

Exhibit 7. Research Questions and Purpose

Research Question	Purpose
1. What is the impact of <i>Pathways</i> on students’ identity-based motivation in 8 th grade?	Assess impacts on core components of IBM (possible selves, strategies, interpretations of difficulty)—demonstrated mediators of academic outcomes.
1. What is the impact of <i>Pathways</i> on students’ social and emotional well-being in 8 th grade?	Assess impacts on core social and emotional competencies and symptoms of depression for students.
2. What is the impact of <i>Pathways</i> on self-regulatory behaviors 8 th and 9 th grade?	Assess impacts on key self-regulatory behavior (time spent on homework, attendance, initiative and behavior in class)—demonstrated mediators of academic outcomes.
3. What is the impact of <i>Pathways</i> on academic outcomes in 8 th and 9 th grade?	Assess impacts on 8 th - and 9 th -grade key academic outcomes (course failure, GPA, test scores); 8 th -grade grade retention; 9 th -grade credits earned and continuous enrollment, that predict on-time graduation and dropout in high school.
4. To what extent do impacts differ for school and student subgroups?	Assess possible impact moderators (e.g., student ethnicity, free/reduced lunch status, urban/suburban and rural schools, school climate measures) to facilitate future replication.
5. To what extent do treatment schools implement <i>Pathways</i> implement with fidelity?	Contextualize impacts and assess delivery of active ingredients of IBM by measuring of dosage, adherence, quality, responsiveness, and fidelity of receipt.
6. To what extent will treatment and delayed-treatment schools differ in their supplementary programming to support student success?	Contextualize impact analyses by describing school programs to help 8 th -grade students improve self-regulatory behaviors, social and emotional competencies and academic outcomes.
7. What are barriers to and supports for successful <i>Pathways</i> implementation across schools?	Barriers and success factors in scaling <i>Pathways</i> to a larger, more diverse population.
8. What is the cost of implementing <i>Pathways</i> per school and per student?	Contextualizes cost/cost-effectiveness of implementing <i>Pathways</i> for interested schools.

E.1 Evaluation Designed to Meet Evidence Standards Without Reservations

Random Assignment. The design for the impact evaluation is a cluster (school-level) RCT. Schools are the appropriate unit of assignment because *Pathways* is a universal intervention implemented with all 8th grade students. The evaluation will assess impacts for 72 middle schools across 13 districts in Nevada. Schools will be eligible to participate if they: (1) can allocate at least 45 minutes of instructional time twice a week to implement each of the 12 sessions at the beginning of their assigned implementation year, and (2) are not currently implementing conflicting programs or initiatives that could undermine the treatment contrast—i.e., programs that may be designed to similarly evoke the *Pathways* active ingredients.

In spring 2021, 2022, and 2023, Summitlab will conduct random assignment in three cohorts of schools: 12 in Cohort 1; 30 in Cohort 2; 30 in Cohort 3. Schools will be blocked by urbanicity (urban, suburban, rural) and pair-matched (matching on percent FRPL, percent minority, prior cohort percent 8th-grade proficient, and prior cohort average 8th-grade GPA). Schools will be randomly assigned in pairs to treatment (to implement at the start of the coming school year) or delayed-treatment control (wait one year). Delayed-treatment schools will provide school as usual including any supplementary non-academic programming during the delayed treatment year (Cohort 1 SY 21-22, Cohort 2, SY 22-23, Cohort 3, SY 23-24). For additional details see B.1.1 for the project design and Section C for training and implementation. **This impact evaluation is designed to meet WWC standards without reservations.** Students in study schools inherit their schools' assigned conditions. Summitlab/AIR will collect 8th-grade student rosters at the beginning of each implementation year (treatment and control schools). The intent-to-treat (ITT) evaluation sample will comprise all students listed on rosters.

School attrition is expected to be low for two reasons. First, we will obtain outcome (Grades 8 and 9) and baseline measures (Grade 7) from district administrative data, allowing for ITT analyses of all students who remain in the districts, even if they leave study schools. We are partnering with 13 LEAs serving 86% of all students in Nevada, hence if students do leave study schools, they are likely to be enrolled at one of our partnering LEAs. Second, we have strong partnerships with NDE and our LEA partners and will stipulate that LEAs provide the needed administrative data for both treatment and control schools in our data sharing agreement. This approach will allow the study team to include all schools in the analysis, regardless of whether they implement *Pathways* and the pair-matched design will allow us to maintain internal validity

of the study should a school choose to withdraw by dropping that school and its matched pair from analyses. The evaluation team also will track attrition of students using fall rosters.

Study will ensure baseline equivalence in analytic sample. The study's blocked, pair-matched random assignment procedure will ensure baseline equivalence on the blocking variable (urbanicity) between treatment and control schools. The pair-matching procedure will help minimize treatment-to-control school-differences. We will collect school-level and student-level baseline data to check baseline equivalence on these characteristics, explain between-school variance in outcomes, and provide more precise estimates of *Pathway's* impact. Establishing students' equivalence is important as it is a key requirement for WWC review if attrition were high. To improve precision impact estimates will control for baseline characteristics.

Study sample size and power. The study's proposed sample size is 72 schools with a conservatively estimated 35 students per school (harmonic mean; arithmetic mean=187 students). The study is designed to detect a minimal detectable effect size (MDES)=0.13—an effect size smaller than the smallest effect size observed in the prior efficacy study (0.17, see Oyserman et al., 2006). The MDES is 0.19 for subsample analyses of 38 rural and 36 urban/suburban schools. See Appendix I for additional technical details.

E.2 Evaluation Will Provide Valid and Reliable Performance Data

The evaluation team will collect outcome and implementation data from several data sources. Data align with the logic model (Exhibit 3). Our measures and timeline of data collection activities are in Appendix I, Exhibit I-4). **As required by WWC, student measures are face valid and reliable** including **district administrative data for student outcomes**—attendance, course grades, state assessment test scores, course credits, enrollment indicators.

Our team has used the **IBM student survey measures** (open-ended expected/feared selves, linked strategies, difficulty mindsets) in multiple federally funded studies. Prior research demonstrated validity/reliability of open-ended responses; however, recently (Horowitz, Oyserman, Deghani, & Sorensen, 2020), we double-coded responses and developed machine coding to reliably code for the two most common and relevant domains (academics and becoming off-track) for both possible selves and linked strategies—an approach we will use at scale for this mid-phase evaluation. Survey measures of interpretation of difficulty have established validity/reliability (ranging from 0.83-0.90; Fisher & Oyserman, 2017). Measures of **social and emotional competencies and depression** have been used widely in countless studies.

To assess **students' disruptive behavior and classroom initiative**, a core-subject teacher in treatment and control schools will report on each 8th-grader's in-class behavior in the spring using the 4-item Finn Disruptive Behavior Scale ($\alpha=0.79-0.81$) and the 4-item Finn Initiative Scale ($\alpha=0.75-0.85$) following the 8th-grade revision of the scale used in Oyserman et al., 2006.

To assess **fidelity of implementation**, we will code video-observations of a random sample of 6 of 12 sessions (one of Sessions 1 or 2, one of Sessions 3 or 4 etc.) for each treatment teacher, obtaining video using the strategy we successfully employed in other studies. Teachers will receive a GoPro camera with instructions at training. They record all 12 of their sessions in exchange for a gift card for successful recording of each of set of 4 sessions. A school-based data collector (e.g., counselor) will receive a gift card to assist teachers with camera setup and download video data. AIR will code 6 sampled sessions from each teacher using reliable (80% or higher interrater agreement) measures of fidelity (dosage, adherence, quality, responsiveness)—see Appendix I for example measures. We will assess fidelity of receipt using a reliable measure ($\alpha=.89$) of students' confidence in using *Pathways* skills and endorsement of core messages.

Summary scores (dosage, adherence, quality, responsiveness, receipt) are converted to a standardized metric (0-100) and averaged ($\alpha=.85$) to create an overall fidelity score that predicts academic and social/emotional outcomes; see Oyserman et al., 2020).

Impacts for students will be estimated using a two-level regression (RQs 1-4), adjusting for clustering of students within schools (see Appendix I for additional details). The model adjusts for matched-pair, student prior performance and characteristics. Models assessing variation in impacts for school/student subgroups will incorporate the appropriate interaction term between treatment status and relevant school or student characteristic. We will supplement ITT analyses with complier average causal effect analyses. The cost analysis will use the Resource Cost Model and *CostOut* tool to generate cost-effectiveness estimates based on cost and impact.

E.4 Clear Components, Mediators, Outcomes and Measurable Threshold

The proposed evaluation design is informed by clearly articulated *Pathways* key components, mediators, and outcomes (see logic model in Exhibit 3) and empirically validated by extensive prior work (see Sections A and B.3). We establish clear thresholds for low, moderate and high implementation following Durlak and Dupre's (2008) conclusions from meta-analytic reviews to infer rule-of-thumb thresholds and typical boundaries of fidelity; they find that interventions delivered in the field by non-researchers are unlikely to attain fidelity above 80% and, if delivered below 60% fidelity, are unlikely to yield impacts. The implication is that as fidelity increases from 60% to 80%, a clearer representation of the theory's active ingredients is delivered. We use this and recent validation of thresholds for teachers implementing *Pathways* (Horowitz, et al., 2018; Oyserman, et al., 2020) to classify classroom- and school-level (aggregate of classrooms) implementation as low if fidelity is under 60%, moderate if it ranges between 60-70% and high if it is over 70%.

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