Career Pathways as a Framework for Program Design and Evaluation

A Working Paper from The Innovative Strategies for Increasing Self-Sufficiency (ISIS) Project

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David J. Fein, Abt Associates Inc.

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Project Officers: Brendan Kelly and Emily Schmitt
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Project Director: Karen Gardiner
Abt Associates Inc.
4550 Montgomery Avenue
Bethesda, MD 20814

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Summary

Career pathways is gaining steady acceptance as an integrative framework for promising approaches to post-secondary education and training for low-income and low-skill adults. Its central thesis is that instruction should be organized as a series of manageable and well-articulated steps, accompanied by strong supports and connections to employment. The steps provide opportunities for pre-college-level students to access college-level training and for better-skilled students to move to successively higher levels of credential-bearing training and employment. Each step is designed to incorporate customized curricula and instruction, academic and non-academic supports, and employment experiences and opportunities.

This framework is being used both to design discrete programs and to foster more systemic change. Programs—whose evaluation is the focus of this paper—typically concentrate on a subset of steps and embody varying service strategies. Systemic change initiatives entail wider-scale institutional re-alignments and coordination, seeking to weave together larger webs of program and resources into seamless pathways whose diverse contributing sources are transparent from the student's perspective.

The career pathways model is relatively new, and its effectiveness—and the effectiveness of most of its components—have not been rigorously evaluated. Effectiveness research often is not the first priority in the early years of an innovation, and career pathways poses special challenges for evaluation design. The underlying model is complex and multifaceted. Thus far it has been articulated loosely for description and promotion but not specified as a tighter framework capable of guiding research.

This paper presents a framework for evaluating career pathways programs and discusses some of the considerations in designing evaluations that use random assignment methods to measure these programs' impacts. It reflects work in progress on the first national evaluation of career pathways programs: the Innovative Strategies for Increasing Self-Sufficiency (ISIS) evaluation. Commissioned by the Office of Planning, Research and Evaluation in the federal Administration for Children and Families (ACF) within the Department of Health and Human Services, ISIS is conducting random assignment evaluations of nine career pathway programs around the nation.

The paper begins with an overview of career pathways, describing the basic model and giving a brief account of its origins. Next, it catalogues some of the principal intervention strategies included in career pathways models and illustrates how several programs participating in ISIS varyingly embody these strategies. The paper then introduces a broad theory of change for career pathways—identifying the primary and intermediate outcomes targeted and tracing the linkages between key program inputs and these outcomes. These domains help to define and systematize priority outcomes to measure in research on career pathways programs.

A concluding section discusses major considerations in designing random assignment evaluations of career pathways programs. To what degree should experiments test entire programs or narrower services and strategies? Which of a wide variety of models is most important to test, and what are the prospects for selecting and designing clusters of tests that will provide the greatest insight into common questions? What are the prospects for testing discrete programs operating within more systemic change initiatives and for testing the many promising new and relatively small programs initiatives have fostered?

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Introduction

The prospects for economic self-sufficiency for millions of low-skilled adults without post-secondary education are becoming increasingly bleak. The share of jobs supporting a middle-class standard of living that require college credentials has grown in recent decades, and the recent recession has accelerated the technological shifts driving this trend.[1] High rates and prolonged spells of unemployment generated by the recession likely caused work skills of many to deteriorate, leading to even greater difficulties finding good jobs as the economy recovers.

In addition to negative consequences for these adults and their families and increased demands on social safety net spending, a large low-skill adult population may place a drag on economic growth. Over 50 million adults in the current workforce have not attended college, and many more have attended college but not completed a certificate or degree.[2] Economists forecast a projected shortfall of several million college-educated workers by 2018.[3] Policies focused on improving prospects for those with low educational attainment could both alleviate economic distress for this population and also help the economy.[4]

The case for such policies depends on how well the underlying challenges for individuals and institutions are understood and the feasibility of addressing these challenges. There has been progress on both fronts. At the individual level, challenges to post-secondary enrollment and completion include weak basic academic skills, low aspirations born of negative school experiences and lack of exposure to careers and college role models, competing demands of work and parenting on time available for school, inability to afford school, and a litany of stressors and personal vulnerabilities associated with poverty.[5] Well documented shortcomings in the post-secondary education system include ineffective approaches to remedial education, competing missions, an emphasis on longer programs and general education degrees, fragmented and inadequate academic advising and student support services, complex course selection systems and financial aid rules, and insufficient financial assistance.[6] Potentially crucial supports from other systems—human and social services, income support, and workforce—are often insufficient and difficult to coordinate.

Mounting concerns and improved comprehension of the underlying individual and institutional-level factors have fueled the development of a wide range of promising instructional approaches and supportive services in the last decade or two. Close on the heels of this outpouring of innovations has been growing recognition that stronger frameworks are needed to integrate discrete innovations in order to make a substantial difference in outcomes. One model—career pathways—is gaining steady acceptance as an integrative framework. Its central thesis is that post-secondary training should be organized as a series of manageable and well-articulated steps accompanied by strong supports and connections to employment. The steps provide opportunities for pre-college-level students to access college-level training and for better-skilled students to move to successively higher levels of credential-bearing training and employment. Each step is designed to incorporate customized curricula and instruction, academic and non-academic supports, and employment experiences and opportunities. The framework has been used to design a wide range of programs— targeting varying skill levels and occupations and utilizing different services and logic models—while adhering to these basic tenets.

The career pathways model is relatively new, and its effectiveness—and the effectiveness of most of its components—have not been rigorously evaluated. Effectiveness research often is not the first

priority in the early years of an innovation, and career pathways poses special challenges for evaluation design. The underlying model is complex and multifaceted—thus far it has been articulated loosely for description and promotion but not specified as a tighter framework capable of guiding research. The discrete innovations regarded as signature service strategies within the career pathways framework have not been defined or mapped out as carefully as needed to guide research and evaluation in this area.[7]

A conceptual framework useful in developing a strong research and evaluation agenda will perform two main functions. The first is to delineate clearly the basic career pathways model and associated signature service strategies. The objective is to be able to purposefully describe and compare widely varying career pathways programs. The second is to provide an overarching theory of change linking program inputs (signature strategies) to primary outcomes, and identifying any intermediate outcomes that programs target more directly to foster primary outcomes. A general theory of change will provide a useful point of departure for specifying hypotheses and outcome measures relevant to evaluations of particular programs.

This paper presents a framework for evaluating career pathways programs and discusses some of the considerations in designing evaluations that use random assignment methods to measure these programs' impacts. It reflects work in progress on the first national evaluation of career pathways programs: the Innovative Strategies for Increasing Self-Sufficiency (ISIS) evaluation. Commissioned by the Office of Planning, Research and Evaluation in the federal Administration for Children and Families (ACF) within the Department of Health and Human Services, ISIS is conducting random assignment evaluations of up to nine career pathway programs around the nation. Although all of these programs embody core career pathways principles, their approaches vary significantly. Designing ISIS has required substantial thinking about how to maximize what is learned both about important cross-cutting ideas in career pathways as well as about strategies and circumstances unique to particular sites. As such, ISIS is providing a laboratory for developing methods for studying career pathways programs as well as an evaluation of a set of promising interventions.

The paper begins with an overview of career pathways, describing the basic model and giving a brief account of its origins. Next, it catalogues some of the principal intervention strategies included in career pathways models and illustrates how several programs participating in ISIS varyingly embody these strategies. The paper then introduces a broad theory of change for career pathways—identifying the primary and intermediate outcomes targeted and tracing the linkages between key program inputs and these outcomes. These domains help to define and systematize priority outcomes to measure in research on career pathways programs. A concluding section discusses major considerations in designing random assignment evaluations of career pathways programs.

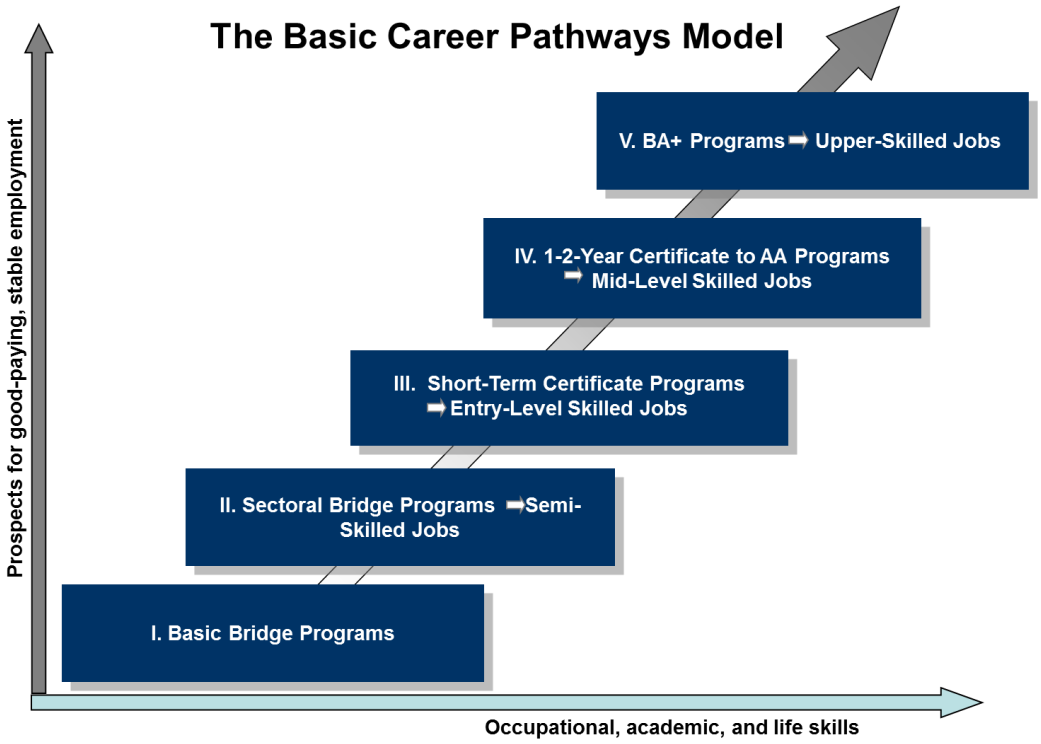
The Basic Career Pathways Model

The essential career pathways thesis is that post-secondary education and training should be organized as a series of manageable steps leading to successively higher credentials and employment opportunities in growing occupations. Each step is designed to prepare students for the next level of employment and education and also provide a credential with labor market value. To effectively engage, retain, and facilitate learning of a diverse population, programs integrate promising instructional strategies, supports, and employer connections. The model assumes interventions must be comprehensive and intensive to address effectively the learning and life challenges facing adult

students. Mobilizing these inputs typically requires a partnership between providers such as community-based organizations, community colleges and other post-secondary training providers, human services and workforce agencies, and employers and their representatives.[8]

Although steps in actual programs vary with their target populations, focal occupations, and service strategies, the broad training and employment levels shown in Figure 1 provide a useful basis for classifying programs.[9] The bottom two steps (I and II) represent so-called "on ramp" and "bridge" programs designed to prepare low-skilled participants for college-level training and lower-skilled jobs with a career focus. Basic skill levels differentiating these two levels vary across programs but generally correspond to the 6th-8th grade and 9th-11th grade ranges, respectively. The next two levels (III and IV) provide college-level training for so-called "middle skills" employment—that is jobs requiring some college but less than a bachelor's degree (e.g., an associate's degree or shorter certificate)—and the final level (V) includes interventions promoting completion of bachelors' degrees and more advanced credentials.[10] The career pathways model is designed to allow initial entries, exits, and re-entries at each stage—depending on skill levels and prior training, employment prospects, and changing personal and family situations.

Figure 1



This framework is being used both to foster systemic change and design discrete programs. Programs—whose evaluation is the focus of this paper—typically concentrate on a subset of the levels shown in Figure 1. Systemic change initiatives entail wider-scale institutional re-alignments and coordination, seeking to weave together larger webs of program and resources into seamless pathways whose diverse contributing sources are transparent from the student's perspective.[11] At this level, the image of a single career ladder or pathway gives way to a series of ladders, or vertical

lattice, identifying opportunities and supporting lateral and upward movement across related jobs in an occupational sector—and sometimes across sectors and career clusters.

An important assumption in career pathways programs for low-skilled adults is that graduates will find enough middle-skilled jobs supporting a middle-class standard of living, and that such jobs will provide stepping stones to more advanced training and higher-skilled employment. Although there has been some debate about whether these assumptions are warranted, the evidence seems generally encouraging.[12] A substantial econometric literature finds positive returns from sub-baccalaureate-level education and training.[13] Middle-skilled jobs are likely to shrink somewhat as a fraction of all net new job openings, but will account for nearly half of all openings by 2018 and are forecasted to outpace the projected growth of qualified workers (due largely to baby boomer retirements).[14] Demand will be especially high in many faster-growing technical occupations, where salaries and advancement possibilities also will be greater.[15] On the other hand, the more technical nature of these fields raises the bar for programs aiming to train adults with weak basic skills. And some observers warn that it can be risky to bet too heavily on training for specific middle-skill jobs given the substantial flux in demand characterizing the sub-baccalaureate labor market.[16]

A Brief History of Career Pathways

An understanding of the career pathways model requires some familiarity with its origins, as well as the ways in which policy, research and practices have shaped the model. The ideas and strategies underlying the career pathways model reflect major advances in the secondary and post-secondary education, workforce, and human services arenas.

In education, the history extends back some decades. One important source of innovations has been the federal TRIO program's Student Support Services, which since the 1960s has supported academic, social, and financial services for first-generation, low-income college students.[17] Other important innovations were promoted by the New Vocationalism movement beginning in the late 1980s.[18] Reacting to a dearth of alternative training opportunities for non-college ready high school students, advocates successfully championed additional resources and authority to support innovative high school vocational programs and high school-college partnerships in the federal Perkins Act. On community college campuses, workforce programs grew in scope and influence, and discussions of how to balance dual missions moved to the center stage in community college policy. These developments highlighted the need to define and map more clearly the relationships between foundational skills for success in school and work, key academic subjects, occupations and career pathways, and career clusters. A series of federal initiatives took on such tasks beginning around 1990.[19]

In the early 1990s, burgeoning welfare rolls led to national shifts in policies with profound consequences for income support and workforce programs. New welfare time limits, financial sanctions for failure to comply with program requirements, and services emphasizing rapid labor-force attachment (or "work first") moved thousands of low-skilled unmarried parents into low-wage jobs with little prospect for economic mobility. While many states and localities implemented predominantly work first-oriented welfare programs, others adjusted policies and services to maximize short-term training opportunities consistent within the work first rules.[20] Thus, to a degree that may not be fully recognized, at the same time work first polices were reducing rates of college enrollment and completion among welfare recipients and unmarried parents generally,[21] they also

helped fuel the development of more innovative, accelerated, and employment-focused training approaches.[22] Meanwhile, random assignment studies finding work first programs had only modest earning impacts and little effect on overall income increased policy makers' interest in training-focused strategies.

With the 2000s came growing recognition of the importance of post-secondary education, the development of many promising instructional strategies and services, and mounting interest in more comprehensive models. Leading foundations helped to make community colleges laboratories for developing and testing learning communities, enhanced guidance services, strengthened financial incentives, and other innovations.[23] In the workforce arena, positive evaluation findings heightened already substantial interest in sectoral employment and training programs providing customized training for high-growth occupations through partnerships between community-based organizations, training and workforce agencies, and economic development agencies.[24] Foundations also launched initiatives designed to stimulate improved coordination and service integration at the state and local levels across such traditional silos as K-12, adult basic education (ABE), developmental education, workforce, human and social services, and college certificate and degree programs. At the federal level, efforts to guide and invest in promising post-secondary reforms have included substantial career pathways grant programs in areas such as green jobs and health care, and White House-led community college reform initiatives.[25]

The number and complexity of these promising initiatives and strategies have fostered strong interest in frameworks capable of harnessing and effectively channeling activity. The career pathways model, in particular, has gained traction among policy makers and practitioners and is arguably the predominant framework guiding development of improved education and training approaches for low-skilled adults and other non-traditional student populations at the moment.[26] As mentioned at the outset of this paper, there has so far been little rigorous effectiveness research on career pathways programs. Related research includes random assignment evaluations of a limited array of community college innovations, of several sectoral training programs operated by community-based organizations, and of one or two career pathways programs, as well as several sophisticated non-experimental studies of comparable strategies.[27] None of these studies has made the career pathways model an explicit framework for program effectiveness research.

Key Descriptive Characteristics and Service Strategies in Career Pathways

There is general agreement on the core components of career pathways programs but little uniformity in approaches to defining and organizing them.[28] Tighter specification is needed for designing and comparing programs. Clear formulation of the basic characteristics of career pathways programs will help to articulate the important underlying hypotheses in evaluations of individual programs as well as across sets of program evaluations. This section takes a step in that direction. It first identifies several characteristics determining the basic orientation of career pathways programs. It then reviews four sets of emblematic career pathways service strategies that varyingly are embedded in career pathways programs.

Three basic characteristics exert substantial influence on the overall design and expected outcomes of career pathways programs:

- **Key organizations involved and their roles.** The fundamental career pathways principle of providing comprehensive and varied services implies a need for a collaborative partnership across organizations with differing missions and strengths. Community-based organizations and community colleges often provide overall leadership and core services, in association with economic development, workforce, human service agencies, and other state and local agencies, business groups, and private funding agencies. The identity, roles, and collaborative arrangements of partners involved determine programs' capacity to effectively design and deliver services.[29]
- **Target populations.** Within the broad career pathways framework, programs may be designed to target widely-varying populations. The basic orientation of a program is determined to a great degree by the level of basic skills and kinds of non-academic challenges its participants face. Some programs target lower-skilled adults and focus on academic preparation, others target better-skilled students and focus on non-academic issues, and some work with a range of skill levels and training objectives.[30] Often-targeted characteristics with substantial bearing on pertinent non-academic circumstances include: participation in public assistance programs, age, family structure, employment status and income, and race and ethnicity.
- **Occupations, credentials, and basic career pathways levels addressed.** Occupations targeted for training represent a third defining characteristic of career pathways programs. The required knowledge and skills, appropriate instructional methods, and possibilities for modularizing training and credentials all vary with occupation, as do opportunities for employment following training.

Building on the platform defined by these characteristics, each career pathways program draws from a wider repertoire of promising service strategies to fill in its design. There are four major categories of hallmark strategies in this repertoire: (1) comprehensive and well-designed approaches to assessment of skills and needs; (2) promising and innovative approaches to instruction and occupational training; (3) academic and non-academic supports to promote success; and (4) approaches for connecting students with career-track employment opportunities. The remainder of this section describes discrete strategies in each category that have come to be emblematic of career pathways programs.

The career pathways model posits the need for comprehensive services, and many exemplary programs incorporate at least some components from all four categories. Both across and within categories, however, there is considerable cross-program variation in where emphasis and resources are placed. Profiles following this section illustrate how emphases vary for four relatively comprehensive career pathways programs.

If a primary assumption is that comprehensive services are needed to support career pathways for non-traditional student populations, an important corollary is that ***comprehensive assessment systems*** are needed to identify the services that will be most beneficial. Candidate areas for assessment include academic skills and interests (e.g., basic academic skills, learning styles/disabilities, and career aptitude/interest) and non-academic areas (e.g., psycho-social factors, college knowledge, job readiness skills, coping skills, and other personal and family challenges).[31] Strong assessment systems include well-designed principles and procedures for making appropriate placements and referrals based on assessment results.

- Leading testing organizations offer a variety of ***basic academic skills*** assessment tools whose basic psychometric properties have been well documented. Although the reliability and internal validity of these tools are generally high, recent research finds high rates of inappropriate college placement decisions for developmental education students and suggests that better results will obtain when results are used in conjunction with other indicators of academic skills and motivation (e.g., high school grades).[32] Another concern is that many programs use assessments developed to assess readiness in one subject (e.g., math, English) to decide placements in a different subject (e.g., introductory nursing, business).[33] Better placement decisions will require measuring skills more directly pertinent to fields of study.

- Developers have created many tools for assessing ***non-academic skills and needs*** in recent decades. Compared with basic skills assessments, there is much greater variability in the constructs addressed, and the psychometric evidence is generally less well-developed. The terrain has not been well mapped in the form of a useful guide to major constructs, tools, and psychometric evidence.[34] A number of good tools exist, but they are difficult for practitioners to identify, and, though their developers have measured correlations with educational outcomes (e.g., college GPA and persistence), there has been no evaluation of their use effectiveness.[35] User manuals and the more general technical assistance literature emphasize that assessment should be pro-active and ongoing, with effective service strategies based on results, but there has been little fine-grained description or evaluation of best practices.

The second category, ***promising approaches to basic skills instruction and occupational training***, includes strategies designed to address weaknesses in traditional curricula and teaching methods. Career pathway approaches assume that instruction must be "student centered," that is, manageable for students likely to be balancing school, work and family life and engaging for a population that, due to previous poor educational experiences, has weak basic skills and often low self-confidence. Signature strategies in this category include:

- ***Well-articulated and shorter curriculum modules.*** Career pathways programs identify sequences of existing or newly-created courses generating credentials valued by employers. There is substantial use of graphics to communicate how these modules or "chunks" map to successive steps on occupational training pathways. Modules are designed to connect easily with additional training through close alignment of content and through agreements to recognize/grant credits across modules, particularly those spanning pre-college and regular college-level training. The underlying assumption is that stackable (i.e., well-articulated) modules encourage persistence by providing quicker recognition and reinforcement of accomplishment and multiple entry and exit points—thereby increasing the likelihood of adults' completing a useful dose of training before leaving for work and later stepping back into school to earn higher credentials as life circumstances permit.

- ***Contextualization.*** This strategy encompasses varying ways of providing basic academic (sometimes non-academic/life) skills in the context of a vocation, academic discipline, or real-life situation.[36] The underlying hypothesis is that, by increasing intrinsic motivation, retention of what is learned, and ability to transfer skills to new applications, contextualization will lead to improved basic skills and content knowledge. Major forms include: integrating applied content into basic academic skills instruction, infusing basic skills instruction into vocational courses,

courses representing hybrids of these two approaches, and approaches that do not alter, but improve coordination between, basic and applied courses.

- ***Acceleration.*** This category includes strategies for reorganizing curricula to allow completion in a shorter (calendar) time period.[37] Curriculum redesign may reduce total hours needed to master material by eliminating redundancies or simply compress the same number of total course/program hours into a shorter time period. Underlying hypotheses are that compression can improve focus and information retention between classes, shorten the time window for outside issues to interfere with school, and provide more intensive opportunities for relationships with teachers and other students to develop. A second form of acceleration is "mainstreaming" in college-level classes underprepared students who (often with additional academic supports), might be able and motivated to succeed without first having to spend time and resources on remedial classes. Strategies for assessing and crediting prior learning in other settings (e.g., non-credit training programs, employment) are another form of acceleration.

- ***Flexible delivery.*** Strategies under this heading include offering training at times and places that are convenient for, and in formats that facilitate participation by, working and parenting adults. Illustrative approaches include evening and weekend scheduling, self-paced instruction, establishing convenient locations for training (e.g., in the community and not a main campus), and technology-supported distance learning.[38]

- ***Active learning.*** Promising instructional approaches emphasize active learning and avoid traditional lecture formats and "skill and drill"-based methods. Strategies emphasize project-based learning and problem-solving tasks, involve more work in groups, and generally foster more classroom interaction. Key assumptions are that these strategies will lead to more active engagement and heighten interest and motivation, as well as supportive relationships.[39]

A third category of career pathways strategies includes ***academic and non-academic supports*** to enhance success and foster persistence in successive training and employment steps.[40] These strategies address gaps and deficiencies in existing supports in meeting the needs of a population facing more extensive academic and personal challenges than traditional college students and include:

- ***Personal guidance and supports.*** Strategies for maintaining a closer personal connection between students and sources of support and assistance are often included in career pathways programs.[41] Many programs provide more intensive and proactive specialized advising, coaching, and case management (often through the same staff), focusing on career planning and a wide range of academic and non-academic issues. But programs also make use of a variety of other, less costly strategies—including use of faculty and peer mentors and group sessions to help with career planning and navigation, connecting to needed services, coping with external life issues, and staying focused and motivated.

- ***Instructional supports.*** This strategy encompasses services focusing both on academic and non-academic needs. Career pathways programs offer supplemental academic supports such as additional tutoring, *ad hoc* sessions on particular topics, study groups, and self-paced computer-based instruction. Relatedly, there is greater attention to cognitive strategies useful in learning, as well as student success skills such as studying, time management, and knowing when and how to get extra help. Supplemental workshops, courses, and support groups also are being designed to

emphasize a much wider range of non-academic skills in areas such as effective communication, coping with stress, maintaining focus and discipline, and managing personal finances.[42]

- ***Social supports.*** The primary aim of this strategy is to foster social and emotional connections between students and with faculty and staff. Approaches include: learning communities (e.g., maintaining student cohorts and consistent faculty-staff relationships across multiple classes), use of peer and alumni mentors, and teaching skills useful in building support and friendship networks.[43] Emphasis in this area has been influenced by findings showing strong connections between social integration at college and college success and showing lower levels of social integration among non-traditional students.[44]

- ***Supportive services.*** Career pathway programs develop capacity to provide students with services that help them cope with issues that may lead to problems with academic performance and persistence. Illustrative services include child care; transportation assistance; and substance abuse, domestic violence, and mental health counseling and therapy. Some services may be provided in house and others through a strong referral network.

- ***Financial assistance.*** It is widely recognized that financial needs and related stresses are among the most fundamental barriers to post-secondary training for low-skilled and economically-disadvantaged adults.[45] Most programs help participants complete financial aid applications and otherwise identify and access sources of financial aid for students and individuals and families more generally.[46] Many programs also provide additional direct financial support to supplement and fill gaps in existing programs. Forms of such support include: reimbursement for child care, transportation, and other expenses for supportive services; financial assistance with a variety of emergency needs; grants to cover tuition, school, and licensure expenses and fees; and performance-based stipends and scholarships.[47]

In the career pathways framework, employment is not simply the desired outcome of training—it is an integral feature of the intervention model and underlying theory of change. ***Strategies for connecting participants with employers*** in career pathways start by targeting training in fields and jobs within occupations based on labor market studies of future supply and demand and involving employers and business groups as partners in designing programs and as instructors and evaluators-advisors thereafter.[48] The goal is to infuse programs with a pervasive relevance to jobs in specific fields in local demand. More specific strategies for fostering connection with employers include:

- ***Employment experience during training.*** One set of employment strategies includes varying approaches to building career path-relevant employment experiences into training programs. Examples include cooperative education, class projects involving simulations of key occupational tasks or real projects for local employers, internships, work study, visits to local employers, and job shadowing.[49] Such strategies variously seek to foster positive training and employment outcomes by promoting engagement, motivation and skill development, improving career awareness and knowledge, providing income through jobs that complement rather than compete with studies,[50] and building a resume and employer connections useful in post-training employment.

- ***Employment after training.*** A second set of strategies aims to provide strong connections to jobs after participants complete career pathways training steps. Such strategies include job placement services based on strong knowledge of and connections to local employers, as well as efforts to create dedicated positions for program participants. Examples of the latter may include

transitional or subsidized employment (typically at the lowest levels on career pathways), apprenticeships, and regular jobs (most often when training is highly customized for and supported by individual employers).[51]

A final category includes several career pathways ***meta-strategies***—strategies embodying principles that cut across the more discrete strategies described above. Although, in the abstract, these principles apply to a wide universe of interventions, each has a distinctive formulation in career pathways:

- ***Packaging to promote "bounded choice."*** The emphasis on comprehensive services and "partner-driven" approaches in career pathways puts a premium on effective service integration. Many programs strive to promote "bounded" or "directed" choice by bundling courses in sequences with needed supports. The strategy recognizes that many students are not well equipped to navigate the dizzying array of course offerings and program requirements, master the intricacies of admissions and financial aid systems, and identify and obtain other public benefits and social services for which they may be eligible.[52] Bundling aims to free students to concentrate on the big decisions and engage more deeply in their studies.
- ***Creating a continuous improvement ethos.*** Strong measurement and monitoring systems are essential in knitting together effective partnerships; helping program staff ensure that each participant is receiving appropriate services and progressing according to plan; and providing the basis for monitoring programs' overall success through statistics on service receipt, milestone attainment, and any "pipeline breaks."[53] Career pathways programs often entail substantial efforts to build data systems connecting information from comprehensive assessments, college records, financial aid and other services and benefits, and employer-reported wage records. The broader "culture of improvement" in career pathways also emphasizes close monitoring of local economic outlooks, adjustments to training programs based on shifts in demand and technology, and ongoing evaluation and improvement of services.
- ***Moving towards scalability and sustainability.*** At one level, advocates have conceptualized career pathways as a framework for systemic change—recognizing that wider policies, funding streams, and institutional capacities ultimately must come into play in order to meet the need for comprehensive and intensive post-secondary training in the population at large. While a significant number of system change initiatives have been launched, most concrete embodiments of the career pathways model to date have been discrete, small-scale, intensive, and relatively expensive programs. Strategies for sustaining, scaling up, and replicating these programs have been an important focus in career pathways technical assistance materials.[54]

Profiles of Illustrative Career Pathways Programs

The foregoing inventory of basic characteristics and signature strategies provides a useful framework for describing and comparing career pathways programs. To illustrate how programs can be set within this framework, this section provides brief profiles for four career pathways programs being tested in the ISIS evaluation.

Carreras En Salud. This program helps low-income adults in Chicago with limited English proficiency prepare for jobs in the health care field ranging from Certified Nursing Assistant (CNA) to Registered Nurse (RN). Instituto del Progresso Latino (Instituto) runs *Carreras En Salud* in a

close partnership with Humboldt Park Vocational Education Center (HPVEC) of Wilbur Wright College, Association House of Chicago, and the National Council of La Raza. *Carreras* is one of the most comprehensive and intentional realizations of the career pathways model.[55] It offers a series of highly-customized instruction modules, or bridges, organized in clusters preparing students for certification in progressively higher-paying health care jobs. A pre-CNA bridge (starting at 6th-grade language level) includes two 16-week modules at Instituto and an eight-week CNA preparation course at HPVEC, after which participants can take the state CNA Certification Exam. A pre-LPN (Licensed Practical Nurse) bridge follows, consisting of two more 16-week modules at Instituto, incorporating preparation in EKG (electrocardiogram) and Phlebotomy for Patient Care Technician jobs. The pre-LPN bridge starts at the 8th grade level in English and math and aims to move participants to 12th grade (college entry) level. Students then advance to a two-to-three semester LPN preparatory step focused on completing regular college prerequisites (mostly at HPVEC) in English, math, biology, and psychology. On admission to the LPN program, a full year of courses at HPVEC, followed by a hospital clinical experience and LPN review course, prepare students for the State LPN exam. In the final step, the program supports completion of two additional courses (chemistry and microbiology) followed by entry into Wilbur Wright College's RN program—an additional year of classes to prepare for State RN certification. The curricula in pre-CNA and pre-LPN bridge courses embody two distinctive ideas: (1) contextualization should involve increasingly specific vocational content as academic levels increase, and (2) instruction and assessment methods should shift at higher levels from a more teacher-directed pedagogy emphasizing standardized tests to more student-initiated learning and project-based assessments. Bridge classes meet four times each week for four hours per day, scheduled from 5:30-9:30 pm weekdays and weekends—with free on-site child care—to help participants balance work and child care responsibilities. Instituto and its partners—notably Association House—provide intensive, comprehensive guidance and case management services with a strong focus on career planning, tutoring, supportive services, and job development and placement. An on-site Center for Working Families provides training and assistance with financial literacy, employability skills, and accessing public benefits. Through public benefits and financial aid, as well as some supplementation using foundation funds, the program strives to ensure that all regular school and living expenses, as well as some emergency expenses, are covered. From inception, *Carreras En Salud* has maintained strong relationships with area employers (notably, through the Metropolitan Chicago Healthcare Council), who advise on program content and channels to internship and provide channels to employment opportunities.

I-BEST. Washington State's *I-BEST* (Integrated Basic Education and Skills Training) program provides customized training in selected occupations at the state's 35 community and technical colleges. The program aims to engage low-skilled adults in occupational training programs and accelerate their progress through a series of certificates and credentials. The target population generally falls in the 6th-11th grade range on standard math, reading, and English tests, with many programs targeting adults at the higher end of this range. *I-BEST*'s signature innovation is a dual-instructor approach pairing basic skills and content instructors together in class for at least 50 percent of the time. Approaches at different schools vary in the amount of time instructors actually co-teach, as well as in the degree of, and approach to, integrating basic skills and occupational instruction (e.g., contextualization). For those students who otherwise would enter traditional remedial courses, *I-BEST* represents an accelerated occupational training model. One or more dual-instructor courses are incorporated into each *I-BEST* program—a short (12-15 credit) course sequence leading to occupational certificates and connecting to longer (45 or more credit) programs. *I-BEST* programs

typically provide a range of other supports, including pro-active advising, supplementary (academic and non-academic) skills instruction, and help accessing financial aid—including state Opportunity Grants covering tuition and fees as well as books and supplies up to $1,000 per year. The bundling of curriculum and supports into short modules represents a fairly high level of "packaging," helping students focus on learning and big picture decisions. The state, working with outside experts, has created a strong culture of improvement, evident in strong longitudinal databases and reliance on analysis in making important policy and program decisions. A non-experimental analysis based on propensity score matching and difference-in-difference methods found modest positive impacts on credentials and other academic outcomes, but not earnings.[56] Many colleges around the country are replicating the model or variations on its dual-instruction approach. ISIS is testing the *I-BEST* program at Bellingham Technical College.

VIDA. Located in the lower Rio Grande Valley region of Texas, *VIDA* (Valley Initiative for Development and Advancement) is a community-based organization focused on helping adult students complete an associate's degree, and—to a lesser extent—shorter certificate programs. It is based on the Project QUEST program in San Antonio. *VIDA* targets low-income students with at least 10th grade-level academic skills who are new or ongoing college students. Working closely with business partners and local economic development authorities, VIDA places students in programs providing training in projected high-growth fields such as allied health, technology, business, education, social services, manufacturing, and specialized trades such as automotive technology. Although the primary focus is students enrolling or enrolled in college programs, *VIDA* also operates an intensive 16-week College Preparatory Academy for students who are otherwise eligible (e.g., at least 10th grade-level skills) but test below skill levels required for college admission. The Academy operates on community college campuses and provides an accelerated package of remedial instruction. Students receive *VIDA's* core services (described below) for two to three years (with an additional year for those entering through the Academy). As the program requires full-time school enrollment, substantial emphasis is placed on determining financial need and identifying sources of financial support. The program also directly provides financial support to help cover needs such as: tuition gaps, child care, transportation, testing and certification expenses, and financial emergencies. *VIDA*'s principal service is a strong, pro-active counseling and guidance program. Counselors hold mandatory monthly meetings with each participant at his/her college to review progress and address academic and non-academic issues (e.g., finances, family problems, time management). They also conduct several on-campus group sessions each month with a cohort of participants. These sessions aim to build social support among students, as well as provide training in areas such as study skills, time management, communication, and work culture and readiness. Counselors maintain strong relationships with local service providers for any specialized referrals that participants may need to help them stay in school. Similarly, *VIDA* has built strong relationships with local businesses on which counselors and students draw in finding jobs. Counselors seek to maintain contact for two years after students complete their programs. A measure of program sustainability is ensured by *VIDA*'s assurance of base funding from local county governments. This funding covers the core administrative team, and this team has designed the model so that services readily can expand or contract with flux in other funding sources. The Project Quest model is also operating in eight other communities and is the subject of a foundation-sponsored replication project.

Year Up. A national program operating in eight cities, *Year Up* provides low-income youths aged 18-24 who have a high school diploma or GED with training and job experience for entry-level jobs in high-growth sectors such as information technology and financial services. Local programs partner

with one or more community colleges, major employers, and a network of specialized service providers. Through an intensive up-front screening process, the program seeks to identify youth possessing motivation and other personal assets but facing other challenges the program can help address. *Year Up* consists of a customized six-month training program at local program offices followed by a six-month internship with a local employer—both requiring full-time participation. Classroom training includes highly contextualized classes in writing and critical thinking, professional skills (e.g., working in teams, business communication and workplace norms), and technical skills (e.g., information technology or financial services operations). Under agreements with local community colleges, participants are co-enrolled as students, can use campus facilities, and earn up to 18 regular college credits for training provided by *Year Up*. Cohorts are organized into "learning communities" of about 40 students, who attend classes and participate in weekly "feedback sessions." During the internship phase, *Year Up* staff members carefully match participants to local employers where they work in entry level career track positions such as: help desk and desktop support (in information technology positions) and fund administration, portfolio accountant, and trade reconciliation (in financial operations positions). Weekly half-day classes at *Year Up* and close monitoring and supervision by program advisors keep students connected to the program during their internships. In addition to regular meetings with staff advisors and outside mentors, students have access to clinically-trained social workers and a wide range of external services. *Year Up* simultaneously provides financial support and signals high expectations through weekly, performance-based stipends of up to $260 throughout the year. In addition to participants receiving feedback from peers and staff, *Year Up*'s "high feedback culture" actively promotes feedback from participants on the program. Program administrators and staff actively recruit and foster relationships with major employers, who advise and help design and provide training, as well as internships, and—often—post-program employment. Employers contribute about half of total program costs for each participant—a key element of *Year Up*'s sustainability strategy. The program encourages longer-term career mobility through extended involvement with alumni and by providing a base of college credits on which to build. A small-scale random assignment evaluation found substantial positive impacts on participants' average total earnings ($3,461, or 30 percent) in the second year of follow-up, and the program has garnered wide attention.[57] ISIS will test *Year Up* on a national level.

Summary. Though only a hinting at the features of career pathways programs more generally, these four programs illustrate well how individual programs can embody key career pathways principles while occupying different spaces in the wider framework. The four programs all seek to engage disadvantaged adults in career track training, but vary in the populations and occupational fields and credentials they target. For the most part, the programs exemplify relatively comprehensive approaches, but their emphasis on particular services and strategies varies greatly. These similarities and differences indicate that the underlying logic models for these programs also embody shared and diverging assumptions about causal mechanisms that must be targeted to bring desired impacts. An overarching theory of change describing the wider envelope of assumptions and causal channels will help to see where individual program logic models fit and begin to identify the broad domains and constructs for outcomes that are important to measure in studying a variety of career pathways programs.

Theory of Change for Career Pathways

A serviceable road map for the hypothesized connections between program inputs and desired outcomes is essential in any good program evaluation. In addition to helping specify programs' ultimate objectives, a good conceptual roadmap will identify any more proximate outcomes that programs target directly in order to influence primary outcomes. Given substantial variation in career pathways program designs, hypothesized pathways to impacts also are likely to vary. An overarching theory of change identifying the full range of relevant outcome domains is needed to specify and measure common constructs and organize findings from different studies. This section outlines a broad theory of change for career pathways that will be useful for these purposes.

The heuristic model shown in Figure 2 shows how program inputs – purposefully integrated bundles of the signature career pathways strategies described earlier – are designed to influence primary career pathways outcomes— successful completion of post-secondary credentials, entry into career-track employment, and subsequent training and employment steps – through impacts on proximate outcomes in six domains. Career advancement increases earnings and economic security and thereby promotes other dimensions of adult, child, and family well-being. A number of characteristics of local environments could facilitate or inhibit desired program impacts—notably the availability of jobs in local labor markets and opportunities to continue training in local training institutions.

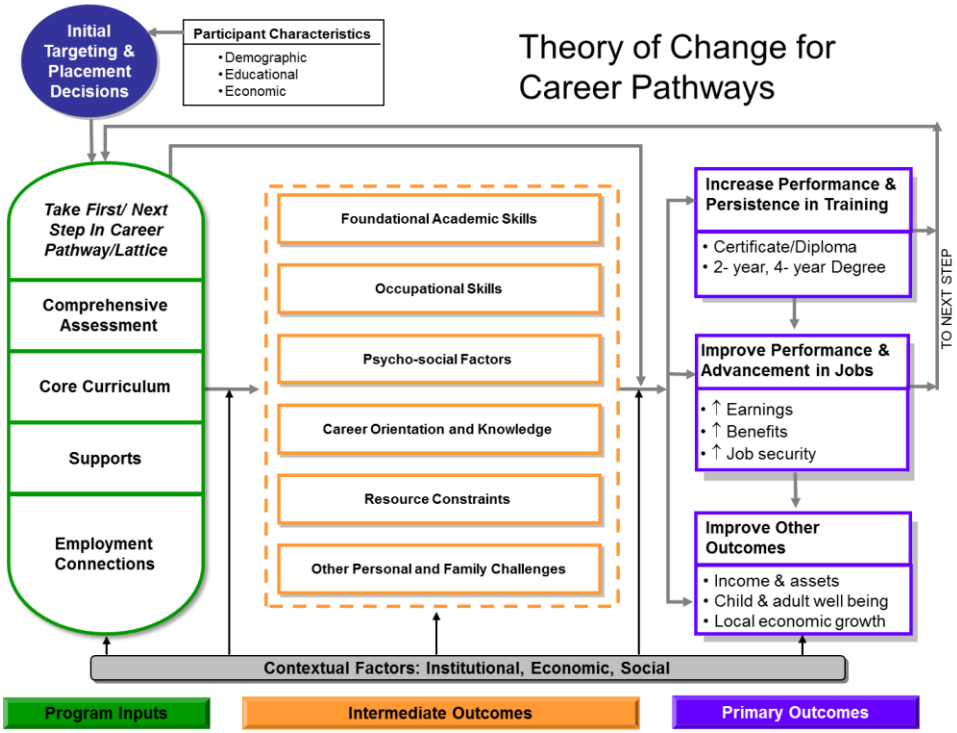
Program inputs. As described in an earlier section, signature career pathways strategies address a wide range of factors hypothesized as important in successful training and employment. Many strategies are devised to address more than one success factor. For example, contextualization may be designed to enhance acquisition of basic skills, occupational skills, or both; flexible delivery of instruction may alleviate difficulties managing training stemming from resource constraints as well as competing time demands of family responsibilities; and assessment and personal guidance may aim to improve psycho-social factors or career awareness and direction. In addition to addressing underlying success factors, some program strategies aim to influence primary outcomes directly: for example, clinical or other internships establish relationships with employers that may lead to job offers—in addition to fostering skill development.

Primary outcomes. The primary objective in career pathways is to foster completion of training and credentials leading to jobs providing good pay, benefits, and advancement opportunities. Targeted credentials vary according to the structure of employment in different occupations and modularization strategies adopted in training programs. Commonly targeted steps include: completing a high school diploma/GED, earning a workforce readiness certificate, meeting requirements for entering a regular college program, and receiving certificates and diplomas based on varying lengths of training thereafter (e.g., shorter and longer certificate programs and associate's and bachelor's degree programs). Evidence of completion of smaller units of training (e.g., hours, credits, and semesters) can provide useful measures of shorter-term progress towards major career pathways steps.[58]

Multi-site evaluations like ISIS must take account of the variety of credentials and occupations targeted in different programs. One challenge is defining measures of credential receipt whose meaning is consistent across programs and between randomly assigned treatment and control groups. Job opportunities in different occupations will vary in ways that affect possibilities for creating credentials of different lengths, and programs will vary in the segments they create within a given

occupation. Credentials of a given length may have very different economic implications within and across programs varying in occupational mix, due to substantial differences in earnings by field.[59]

Figure 2



Primary employment outcomes include entry to and advancement in career-track jobs and increased earnings and benefit receipt. In the short run, time and energy invested in school may preclude positive employment and earnings impacts and even produce negative ones. How long and how large such effects are depends on the length and intensity of time programs expect students to devote to studies and whether and how the program encourages participants to combine work and school. Joint outcomes capturing overall levels of career pathways-relevant activity offer a potential solution to the challenge of defining primary outcomes applicable to varying time horizons, program models and individual choices.

Intermediate outcomes. Intermediate outcomes targeted in career pathways programs fall into six broad domains, each representing an important subfield of research and practices.[60] Although these domains are generally distinct, there is some overlap in underlying constructs across domains. This overlap reflects the variety of streams of policy and research contributing to career pathways, as well as the conceptual complexity of the factors involved.

- *Foundational academic skills*. Improving basic reading, writing and math skills is the main focus of bridge and other programs focusing on steps I and II in the basic career pathways model (Figure 1). These basic academic skills are strongly correlated with success in college-level courses in English and math, which are prerequisites to more specialized coursework.[61] Recent literature on college readiness also has recognized as foundational and teachable an array of general skills needed to learn and succeed in school. These skills include cognitive strategies closely associated with critical thinking, as well as control over behaviors needed for effective

study and learning.[62] Most of these skills also are thought to be factors in success in performing job duties and other life responsibilities, as well as in college success.

- *Occupational skills.* Skills required for successful job performance encompass both specialized technical knowledge required in particular occupations as well as the ability to call on more generic skills in applying this more specialized knowledge on the job. In addition to the cognitive strategies mentioned above, these more general abilities include "non-routine" skills such as effective collaboration and time management.[63] Research documenting the varying mixes of general skills required for success in varying occupations has provided the basis for efforts to certify work readiness as well as foster skills needed at increasingly advanced levels in different occupations. Through formal instruction and clinical or other internship experiences, career pathways programs aim to impart both specific technical knowledge and more general skills required to effectively apply this knowledge.

- *Psycho-social factors.* A third category includes basic psycho-social qualities related to personality traits but conceptualized as more malleable—and thus potentially teachable—beliefs, attitudes, and skills. Major constructs in this category include: (1) the ability to self-motivate, commit to goals, and sustain discipline in pursuing them; (2) the ability to develop and maintain positive beliefs and feelings about one's self and others; (3) skills needed to engage socially and develop social supports (actual and perceived) for one's school and work pursuits; and (4) the ability to open oneself to new ideas and experiences, to be creative. A growing body of research is establishing important, if complex and variable, evidence on these factors' malleability and their connections to education and employment outcomes.[64] Career pathways programs seek to foster interest and motivation, positive attitudes, and social skills and engagement through direct instruction in these skills and engaging academic and social activities.

- *Career orientation and knowledge.* Non-traditional students such as low-skilled adults often have minimal exposure to the basic ideas, possibilities and requirements for pursuing a career. They thus are likely to lack direction and skills needed in career planning, selecting courses, applying for financial aid, seeking help with academic and non-academic problems, and successfully applying for career-track jobs. Strategies in this domain aim to enhance participants' ability to navigate successfully the norms, expected behaviors, and processes governing college and professional work settings. A number of career pathways support and employment strategies target these abilities, including: more intensive counseling and "career navigation" supports, formal instruction in skills for success in college and work, packaging training and supports in ways that allow students to focus on big picture decisions with less need to arrange myriad details, and exposure to expectations in different employment settings through hands-on class activities and structured work experiences.

- *Material resources.* A substantial body of evidence documents negative associations between resource constraints and low-income adults' enrollment, performance, and persistence in post-secondary education and training.[65] Such adults typically face greater needs to work than traditional-aged students, who are less likely to have children and more likely to have access to some support from their own parents. A number of studies have found post-secondary success to be positively related to access to financial aid and fewer work hours (particularly below the 20-hour/week threshold).[66] Working adults often do not qualify for major financial aid programs designed for traditional students, and the amounts available to those who do qualify rarely cover their needs. Additional constraints arise from limited access to computers and transportation and

other personal and family challenges that occur more frequently in low-income populations.[67] Financial hardship can create debilitating stresses and mental health problems, as well as increasing vulnerability to more acute emergencies that negatively can affect performance and persistence in school and at work.[68] To varying degrees, career pathways programs address resource needs by establishing guidelines on hours of training and employment and by helping participants to access student financial aid and public assistance and supplementing existing programs with stipends and in-kind services.

- *Other personal and family factors.* Financial hardships can give rise to a variety of personal and family challenges that can interfere with success at school and work. Extensive research has documented connections between poverty, psychological stress, mental health and resulting difficulties sustaining levels of concentration and engagement needed to pursue a career and balance doing so with family responsibilities.[69] Strong social supports can provide instrumental as well as emotional reinforcements to buffer the potentially destabilizing effects of financial and other stresses.[70] Additional barriers include access to child care and transportation, substance abuse, other health conditions, family violence, and criminal background.[71] In addition to assistance with material resources, career pathways programs often provide intensive assessment, counseling and case management aimed at identifying and helping participants develop strong coping skills and obtain services to alleviate these challenges.

Other individual, family, and community outcomes. An important rationale for improving low-income adults' education and earnings is to enhance a range of other life outcomes connected with income and self-sufficiency and, for parents, the well-being of children.[72] In the long term, higher incomes, benefits, and improved job opportunities may lead to improved psychological well-being of adults and enhance material aspects of daily living increasing the quality of parenting, child care, and other resources available to children. In the shorter-term, post-secondary education can bring new skills and social relationships that improve general functioning and satisfaction, perhaps also translating into better relationships outside school. Anecdotal reports from low-skilled parents suggest potential improvements in abilities to help children with homework and provide positive role models as students and aspiring professionals. Career opportunities may lead to more careful planning and often postponed timing of marriage and childbearing.[73]

Unfavorable outcomes also are possible, especially in the short run. Substantial time and other resources devoted to education may limit the amount of time and energy available to invest in family and employment. Elevated stress due to difficulties balancing school, family, and work responsibilities and any need to reduce earnings while in school may increase the risk of depression, relationship conflict, and parenting difficulties. Increased education may reduce marriage prospects for adults in demographic groups where prospective partners tend to have less education and societal norms discourage marrying outside the group.[74]

Finally, at the community level, career pathways programs help to meet the demand for skilled labor in growing industries. By supporting economic development, they also can help foster growth in employment, business activity, and tax revenues.

Contextual factors. Two aspects of local environments are especially likely to affect the degree to which career pathways programs foster positive outcomes. The first is the condition of the local economy.[75] Although career pathways programs are designed to train for occupations with strong

projected demand, forecasting is notoriously difficult in local labor markets, and jobs may not be available to the extent anticipated.[76]

A second key contextual factor is the availability of opportunities to continue training after students finish a particular program. As discussed earlier, career pathways programs typically focus on established steps—sometimes a single credential—in an occupation while imparting aspirations and skills to continue training after finishing the program. Other things being equal, the impacts of a successful program are likely to be greater when those completing it have ready access to good follow-on training.

Key questions about program impacts. This theory of change for career pathways identifies the questions that impact evaluations like ISIS should address for a deeper understanding of program effectiveness. Do career pathways programs increase post-secondary attainment and career-track employment, thereby leading to significant earnings gains? What are impacts for intermediate outcomes targeted by specific program components, and how do these patterns help explain results for primary outcomes? How do impacts in one intermediate outcome domain affect impacts in other intermediate domains? Do successful programs also improve well-being in other life domains? Are impacts better for some participant subgroups and local environments than for others? To what degree do programs lead participants to take "next steps" on career pathways after completing initial steps?

Designing Random Assignment Evaluations of Career Pathways Programs

The only design that can provide reliably unbiased answers to these questions for individual programs is a well-implemented random assignment experiment. Randomization reliably generates groups that are similar at the outset and differ systematically thereafter only in the services they receive. Impacts so measured are not prone to the unmeasured biases and many other limitations of non-experimental designs. But experiments can be difficult to implement, and career pathways framework poses a number of tricky challenges in arriving at a strong experimental research agenda.

Though career pathways programs share core principles, their basic characteristics and service strategies vary widely. A single experiment can measure effects of only a limited number of treatments—often just one. To what degree should experiments test entire programs or narrower services and strategies? Which of a wide variety of models is most important to test, and what are the prospects for selecting and designing clusters of tests that will provide the greatest insight into common questions? What are the prospects for testing discrete programs operating within more systemic change initiatives and for testing the many promising new and relatively small programs initiatives have fostered?

As the first multi-site random assignment evaluation of career pathways programs, ISIS has had to work out answers to these questions. Similar questions will arise in setting evaluation priorities for other career pathways programs sponsored by federal agencies, foundations, state and local agencies, colleges, and private and community-based organizations.[77] To help guide thinking about a wider evaluation agenda for career pathways, it may be useful to ponder the questions and considerations that informed directions in ISIS.

Evaluate bundles or discrete service strategies? The career pathways model holds that organizing comprehensive, well-integrated services into manageable employment-relevant steps is a more

effective way to promote success in higher education for academically and economically-disadvantaged adults than traditional approaches. If this thesis is largely untested, evidence also is weak on many of the promising services proposed for inclusion in the overall model. The career pathways framework thus highlights the need for evaluation of both comprehensive programs and their constituent strategies.

In ISIS, the decision was to test overall career pathways programs rather than discrete strategies. Project sponsors and stakeholders consulted placed a strong priority on identifying interventions with potential for substantially increasing earnings.[78] Because well-designed career pathways programs integrate a range of promising services in an intentional manner, findings would speak to clear models of interest and not merely haphazard bundles of services. The evaluation team recognized also that some light could be shed on the effects of constituent strategies within broader tests using qualitative and non-experimental methods. As envisioned for ISIS, such a line of investigation will begin with a careful description of where each program fits within the broader career pathways framework. To the degree that program components target specific intermediate outcomes, analyses of patterns of experimental impacts across these outcomes will help to identify services that may have been particularly effective. And non-experimental analyses of correlations between impacts on intermediate and primary outcomes will help to establish whether strategies that affect the former may have affected the latter.

In principle, a more rigorous way to measure the effects of constituent program components would be to conduct sub-tests within broader experiments by randomly assigning a sub-set of treatment group members to receive or not receive those components. Such designs require larger sample sizes than most ISIS sites will provide but may be possible in future studies.

There is a strong case for more concerted efforts beyond ISIS to test discrete strategies in their own right. Most signature service strategies in career pathways are promising, increasing in prevalence, and largely untested. For some interventions, multi-site evaluations could be valuable for establishing general effectiveness, whereas for others multi-site designs might be the best way to begin to explore alternative designs. Examples of the latter include multi-site tests currently underway of varying approaches to learning communities and performance-based scholarships at community colleges.[79] Multi-site evaluations focusing on varying approaches to contextualization and acceleration, active learning, pro-active guidance and career navigation, life skills curricula, and career-relevant employment experience also would be valuable.

The career pathways theory of change suggests the importance of documenting in tests of narrower evaluations the degree to which other career pathways services are abundant in the local environment. The potential impacts of focal strategies' success in addressing a particular issue will depend to a substantial degree on whether recipients are able to get help meeting other needs—better "enabling" the focal strategy to succeed. As an example, one might expect a promising instructional strategy such as contextualization to have more positive effects when participants also receive strong supports in coping with non-academic issues. Measuring impacts in average or even weak service contexts may help to gauge potential wider effects, but tests under optimal environmental conditions are needed to satisfy interest in potential efficacy.

To what should career pathways programs be compared? In working with state and local programs to design experiments in ISIS, there often has been anxiety about conditions applying to the control

group and, especially, whether a valid experiment requires denying access to other services at the host institution or in the general community.

The questions motivating career pathways evaluations typically imply that the most relevant comparison standard is "usual services"—that is, whatever services control group members would receive absent the intervention tested—rather than no services. Two broad situations define "usual services" in different ISIS sites and are likely to apply in other evaluations.

The first provides the pertinent backdrop for tests of programs aiming to engage low-skilled adults in the community in post-secondary training. For such programs (which often are run by community-based organizations), the relevant standard is other training, support, and employment services in the community. The main hypothesis is that career pathways program will address barriers to training and an opportunity to receive better training and supports than are otherwise available in the community.

A second set of conditions applies when interventions targets adults who otherwise would enroll in post-secondary training but whose prospects for success absent the new services would be poor due to weak basic skills and varying non-academic factors. The relevant counterfactual in this second instance is training and supports otherwise available at the same institution—services that may include traditional remediation, standard occupational and degree programs, and little by way of proactive guidance or employment services.[80]

In both situations, the relevant standard is whatever services characterize the existing (pre-career pathways) environment.[81] Control conditions thus will vary by site, as some communities provide more and better alternative opportunities than others. Informative findings do not require that comparisons meet any absolute standard, only that the difference in services be substantial and well-measured.

How to identify meaningful clusters of tests? The field should approach career pathways evaluations with the aim of learning as much as possible across tests of different programs. Simply keeping good track of where each test fits in the general career pathways conceptual framework and encouraging more research on important gaps in the framework will help to build a more systematic knowledge base. More deliberate efforts to organize clusters of experiments around important similarities and differences across programs will provide even greater dividends.

Tests of clusters of similar programs will help to establish effectiveness under a range of circumstances—say, in different local economies or organizational settings. Given sufficient similarity, pooling samples across tests leads to more generalizable estimates of program effectiveness, as well as greater statistical power—that is, an evaluation's ability to detect smaller impacts and differences in impacts across population sub-groups.

The extent of similarity required in clustering programs depends on which elements are deemed key to models of interest. A good case for clustering would apply, for example, to a set of bridge programs aimed at roughly similar basic skill levels and population standard (e.g., student/community sample), and including a good representation of career pathways service strategies—even if exact services and target populations and occupations differed.

Clustering also must take account of the degree of cross-site variability in conditions experienced by control groups. Since variability in alternative services is natural, impacts measured against varying

conditions generally will provide a more representative portrait of program effectiveness. But the control group conditions for a given intervention may not be comparable in different sites if target populations are too different. Tests of a generally similar bridge program model for adults already enrolled in college and for adults in the community who otherwise might not go to college imply very different counterfactuals, for example—traditional college developmental education sequences for the former and very different services (if any) for the latter.

ISIS is working with a fairly heterogeneous collection of tests, and, though more careful analysis may identify one or more sub-clusters, at this juncture the differences generally seem greater than the similarities. Absent clusters, the approach is likely to involve treating each site as a separate study and reporting its findings separately. In so doing, the evaluation will identify where each program and its associated hypotheses fits within the broader conceptual framework for career pathways described in this paper. So situated, findings for different ISIS sites usefully may be clustered with findings from future career pathways evaluations, if not with each other.

When is systemic change a problem in experiments? As discussed in an earlier section, a career pathways program of interest may be embedded in a wider system change initiative. To the extent that systemic change generates a large number of comparable services, there may no longer be a sufficiently distinct pre-career pathways "usual services" environment to provide a meaningful counterfactual. Although possible, experience recruiting career pathways programs for ISIS suggests that few states and communities have progressed to such a point in implementing systemic reforms. Most emerging career pathways programs stand out clearly from their environments.

Where systemic change precludes random assignment at the individual level, random assignment of institutions or local areas to participate or not participate in career pathways initiatives may be an attractive alternative evaluation strategy. Limited resources often require federal, state and foundation initiatives to select a subset of institutions or local areas for funding. A lottery provides one fair way to make decisions and, if coupled with a high quality evaluation, may be well justified.

As noted earlier, the ethos of continuous improvement espoused in system change initiatives also has been incorporated in more discrete career pathways programs. This principle raises the question of whether and how changes in services to treatment group members affect the validity of career pathways experiments. The answer will depend on what changes and how well-established programs were at the outset. In principle, so long as sites adhere to a consistent, well-implemented basic model from the beginning, improvements may be regarded as part and parcel of the treatment.

When is a program too small or too new for an experiment? Recent government- and foundation-sponsored initiatives have produced many small career pathways programs. Some are operating on a pilot basis and have yet to resolve key implementation challenges. Sponsoring agencies rightly may discourage participation in an impact evaluation until their programs have grown and matured. Negative findings from premature impact evaluations bring substantial risk of potentially promising programs losing momentum and deserved support in the longer run.

Experience in ISIS suggests a need to look beyond size and age alone in determining experiment-readiness, however. Programs may be small for varying reasons—limited demand for training in particular occupations, lack of funds, or more basic institutional impediments to growth. Some programs may have capacity to grow by increasing numbers trained for particular occupations while others may be able to expand their model to additional occupations. Well targeted and studied efforts

to scale up promising models will generate useful knowledge about increasing programs' reach, as well as larger samples for evaluating their impacts.

Similarly, careful piloting and assessment must be conducted to ensure any program is ready for a random assignment evaluation. Some organizations may be capable of implementing new programs relatively quickly and well, whereas others may not be. Given the range of service strategies typically included in career pathways programs, prospects for new programs generally will be strongest in organizations that have been operating key elements for some time.

Conclusions

This paper has argued that career pathways provides a useful framework not only for designing programs but also for building systematic knowledge on promising strategies for increasing the economic self-sufficiency of low-income adults. Promising aspects of this framework include its strong conceptual foundations, emphasis on post-secondary skills training combined with comprehensive supports and employer connections, and growing adoption by policymakers and practitioners.

The paper reviewed career pathways principles, strategies and theories with an eye towards tightening this framework to better guide program design and evaluation work. It began by summarizing essential features of the career pathways model and distinguishing five broad levels of training and employment useful in classifying programs. It next identified several attributes defining programs' basic orientation: the organizations involved (specifying their type, roles and approaches to partnership); populations targeted; and occupational fields and credentials for which training is provided. Abstracting from a large literature, the paper introduced a parsimonious list of promising instructional, support, and employment service strategies whose inclusion and form determine program content. Last, the paper outlined a broad theory of change summarizing major overarching hypotheses and outcomes of interest in career pathways. Such a theory can help to establish consistent measures across studies and set findings for individual programs into a larger context.

This paper also assessed some of the major considerations involved in designing random assignment evaluations within this framework. This assessment is based to a large degree on the challenges and possibilities addressed in work on the ISIS project, which has led to one set of experiments but alerted us to the potential value of related design thinking for future studies. Additional random assignment evaluations are needed to do justice to the scope and promise of emerging career pathways programs and fill substantial gaps in knowledge about them.

The design issues discussed here represent just a few of many challenges in conducting informative experiments in this area. And still other issues arise in designing implementation and benefit-cost studies, as well as other kinds of (non-evaluation) research studies. Which skills and personal characteristics best facilitate and impede career engagement and mobility? What are the best ways to measure these skills and characteristics? What middle-skill jobs are accessible for adults at varying skill levels, and how difficult is it to advance beyond such jobs? What more general skills are required to move across jobs and occupational sectors, and to what extent can programs focused on skills for specific jobs also address these more general skills?

If the case for a well-organized wider career pathways research agenda seems compelling, it is less clear what would be the most hospitable auspices for developing and carrying out such an agenda.

Much as career pathways programs are fundamentally organic, multi-stakeholder, partnership-driven approaches, it is difficult to imagine a single agency leading a broad knowledge-building agenda in this arena. Both formal, as well as more loosely-structured, research partnerships might be explored.

Notes

[1] Carnevale et al. (2010), Council of Economic Advisors (2009).

[2] See www.bls.gov.lweb/empsit/cpseea5.pdf.

[3] Carnevale et al. (2010).

[4] On the case for investing in education and training during recession, see Burtless (2009) and Strawn (2010a).

[5] Assessments of factors in post-secondary enrollment and completion include: Adelman (1999, 2004), Fein & Beecroft (2006), Goldrick-Rab & Sorenson (2010), Horn & Kojaku (2001), Matus-Grossman & Gooden (2002), and Tinto (1993).

[6] See reviews of evidence on traditional remedial instruction in Bailey (2009), Grubb (2001), Hughes & Scott-Clayton (2011), and Kazis & Leibowitz (2003). On fragmentation and complexity of curricula, financial aid and other community college systems, see Rosenbaum et al. (2006), Scott-Clayton (2011), and Goldrick-Rab & Sorenson (2010). On systemic problems more generally, see Alssid et al. (2005), Brock & LeBlanc (2005), Council of Economic Advisors (2009), Jenkins (2006), and Pleasants & Claggett (2010). On low completion rates among community college students, particularly non-traditional and economically-disadvantaged students, see discussions in Cooper (2010), Goldrick-Rab & Sorenson (2010), Purnell & Blank (2004), and Visher et al. (2008).

[7] Pusser & Levin (2009) express this need in the community college context: "The development of a conceptual framework for community college vocational and occupational programs is essential not only for program coherence and operational efficiency but also for the design and implementation of a system of program assessment and evaluation (p. 20)."

[8] For general presentations of career pathways strategies for adults see: Alssid et al. (2002), one of the earliest expositions; Estrada (2010); Hinckley & Hull (2007); Jenkins (2006); League for Innovation in the Community College (2007). On applying career pathways framework to high-school students, see Hull (2004) and Hull ed. (2005).

[9] Figure 1 is an adaptation of basic levels depicted for the Wisconsin RISE program (see summary in Strawn 2010b). For other general representations see Jenkins (2006) and Hinckley & Hull (2007). For steps in a variety of actual career pathways programs, see examples in Jobs for the Future (2010a) and Strawn (2011).

[10] Though this paper focuses on levels I-IV, the career pathways framework also includes promising emerging strategies targeting bachelor's degree completion—such as applied baccalaureates at community colleges (Rund et al. 2010; Townsend et al. 2009) and bachelor's degree completion interventions targeting adults who have substantial credits towards a bachelor's degree but are not enrolled in college (see, for example, www.okhighered.org/reachhigher).

[11] Alssid et al. (2002). In the systemic view, career pathways are viewed as "the building blocks of a critically needed systemic transformation (League for Innovation in the Community College 2007, p.1)." For descriptions of a number of state-level career pathways initiatives, see Price & Roberts (2009) and Stephens (2009). A good summary of broad systemic principles is provided in a recent letter expressing three federal agencies' joint commitment to promote career pathways approaches: 1) build cross-agency partnerships; 2) identify sector or industry and engage employers; 3) design education and training programs embodying specified components; 4) identify funding and blend funding sources; 5) align policies and programs; and 6) measure system change and performance. The letter also identifies a series of service components and strategies pertinent to designing discrete programs, as discussed later in this paper. See U.S. Departments of Education, Health and Human Services, and Labor (2012).

[12] See Holtzer's (2010) response to Autor's (2010) analyses indicating shrinking middle-skilled jobs and an "hourglass economy."

[13] See Belfield & Bailey (2011); Kane & Rouse (1995); Jacobson et al. (2005a, b); Jacobson & Mokher (2009); Jepsen et al. (2009); and Marcotte (2010).

[14] Carnevale et al. (2010), Holzer (2010), Holzer & Lerman (2007).

[15] Carnevale et al. (2010), Holzer (2010).

[16] Pusser & Levin (2009, p. 21) make this point.

[17] See Chaney et al. (1997) for a description, history, and early impacts of SSS. Chaney (2010) provide econometric analysis of six-year impacts.

[18] On the role of the New Vocationalism movement in supporting developments related to career pathways, see Hull (2005), Miller (2005), Pusser & Levin (2009), and Soares (2010).

[19] See Secretary's Commission on Achieving Necessary Skills (1991) and extensive career pathways and cluster mapping at www.careertech.org.

[20] See Dave et al. (2011) on variation in state TANF rules, Greenberg et al. (2000) on flexibility in TANF policies, and arguments and examples in Brock et al. (2002) and Martinson & Strawn (2003).

[21] For econometric evidence that welfare reforms reduced college enrollment and full-time vocational training see Dave et al. (2008, 2011). Shaw et al. (2006) trace the history and document how state and local Temporary Assistance to Needy Families (TANF) and Workforce Investment Act (WIA) programs restricted access to training in the late 1990s.

[22] A number of state TANF agencies forged strong relationships with community college systems in the mid-late 1990s, through which substantial TANF funding flowed to college programs. Strictures on length and types of training put pressure on colleges to adapt and develop suitable training programs, often with work study provisions helping to address work requirements. Scholars have not documented this story to our knowledge. Good examples are provided by experiences in California and Kentucky, which made major investments in community college innovations using TANF funds (e.g., Bone 2010; http://www.cccco.edu/Portals/4/Reports/CalWORKs2010toPrint.pdf).

[23] See, for example, the Lumina Foundation's Achieving the Dream initiative (www.achievingthedream.org) and the evaluation program on related interventions at MDRC http://www.mdrc.org/area_index_5.html.

[24] Maguire et al. (2010) report positive findings from the Sectoral Employment Impact Study, which conducted random assignment evaluations of programs operated by Jewish Vocational Service in Boston, Per Scholas in New York City, and the Wisconsin Regional Training Partnership.

[25] See Pleasants & Clagett (2010, Appendix) for summaries of foundation, federal, and state initiatives. Needels & Mastri (2010) and Martinson et al. (2010) summarize green jobs, health care, and other grant programs funded under the 2009 American Recovery and Reinvestment Act. For material on the White House Community College Initiative, see www.whitehouse.org/communitycollege.

[26] This high level of acceptance is illustrated in letter of joint commitment to promoting career pathways approaches issued by three federal agencies. The letter summarizes the rationale for and broad principles to guide system re-alignments and identifies a series of promising approaches the agencies would like to see embodied in programs. See U.S. Departments of Education, Health and Human Services, and Labor (2012).

[27] For findings from random assignment tests of specific community college-based strategies, see Fein & Beecroft (2006) and reports at http://www.mdrc.org/area_index_5.html. For experimental evidence on sectoral programs and a promising career pathways program for youth (Year Up) described elsewhere in this paper, see Maguire et al. (2010) and Roder & Elliot (2011), respectively. For non-experimental analyses of impacts of Washington State's I-BEST program (also described later in this paper), see Zeidenberg et al. (2010).

[28] Illustrative are lists in Jenkins (2006), Jobs for the Future (2010a), Hinckley & Hull (2007), League for Innovation in the Community College (2007), and Pleasants & Clagett (2010).

[29] Alssid et al. (2005) and Estrada (2010) discuss roles and challenges in forging career pathways partnerships.

[30] Kazis & Leibowitz (2003) discuss and illustrate programs distinguished on this basis. Relatedly, programs vary also in how narrowly they define academic and non-academic targeting criteria. Less selective programs must be ready to work more intensively with students facing difficult challenges but if effective will be applicable to wider populations. Programs with more rigorous selection criteria may be in a position to focus resources on students who can benefit, but will be less widely applicable and must take care to avoid creaming.

[31] For discussions of comprehensive college readiness assessment, see Conley (2007). For examples of a wide range of assessment tools, see Saxon et al. (2008), Levine-Brown et al. (2008), and Sedlacek (2004).

[32] Hughes & Scott-Clayton (2011), Scott-Clayton (2012), Belfield & Crosta (2012).

[33] Hughes & Scott-Clayton (2011).

[34] A commendable example of the kind of conceptual mapping and summary of psychometric evidence needed is a recent guide to eight leading instruments for assessing non-academic skills for middle and high-school aged youth (Wilson-Ahlstrom et al. 2011). To our knowledge no comparable guides exist for traditional college or older age groups. Saxon et al. (2008) and Levine-Brown et al. (2008) provide a two-

part inventory of instruments they label "affective assessments." Although it contains limited analysis of concepts, measures and psycho-metric evidence there are useful leads to tools.

[35] Examples of relatively sophisticated efforts to chart and measure skills for success at school and work include instruments developed by the testing firm ACT, Inc. (e.g., Robbins et al. 2006, Le et al. 2010) and for the federal Occupation Information Network (O*NET, see tools at http://www.onetcenter.org/tools.html).

[36] Perin (2011) provides a useful review of the descriptive and evaluative literature on contextualization. Estrada (2010) and Jobs for the Future (2010b) provide guidance on contextualization practices.

[37] Edgecombe (2011) provides a useful review of literature on acceleration strategies.

[38] On the general need for flexible scheduling and formats, see League for Innovation in the Community College (2007). A recent review of evidence on on-line learning raises caution about over-reliance on technology in instruction for low-income and underprepared students (Jaggars 2011).

[39] Although based on good evidence of ineffectiveness of traditional remedial instruction methods, there has been little careful evaluation of active learning strategies or newer, more student-centered pedagogies more generally (Edgecombe 2011). Hodara (2011) reaches a similar conclusion in reviewing developmental math pedagogies, but does find encouraging evidence for strategies emphasizing student collaboration.

[40] This section draws on useful reviews of support strategies in Jobs for the Future (2010a), Karp (2011), and Purnell & Blank (2004).

[41] Karp (2011) finds weak support for enhanced individual guidance strategies and somewhat stronger support for group approaches such as student success courses. Choitz et al. (2010) discuss emerging practices in career pathways guidance services.

[42] Chaney (2010) provides non-experimental evidence that supplemental instructional services under the Student Support Services of the federal TRIO program promoted persistence and other positive outcomes among low-income, first-generation college students. Weiss et al. (2011) find positive impacts on persistence in the short- but not longer-term of a mandatory program for probationary community college students based on a student success course. Zeidenberg et al. (2007) find higher rates of persistence, credential completion, and transfer in a non-experimental analysis of statewide student success course participation in Florida. In another recent non-experimental analysis, Cho & Karp (2012) also report positive associations with student outcomes (short-term measures of credits earned and persistence) for student success course enrollees in Virginia.

[43] Learning communities have been the subject of a series of random assignment tests conducted by MDRC. See Visher et al. (2008) for an overview of these tests.

[44] Tinto (1993).

[45] For example, see discussions in Council of Economic Advisors (2009), Goldrick-Rab & Sorenson (2010), Long (2010), and Sugar (2010).

[46] The potential effectiveness of such approaches is supported by positive findings from an experimental test of additional help completing FAFSA, the Free Application for Federal Student Aid (Bettinger et al. 2009).

[47] Findings emerging from a set of random assignment tests of performance-based stipends have been generally positive (Patel & Richburg-Hayes 2011).

[48] For discussions of this principle in designing career pathways and related programs, see Estrada (2010); Jobs for the Future (2010a), League for Innovation in the Community College (2007); Pindus et al. (2004); Rosenbaum et al. (2006), and Soares (2010).

[49] See discussions in Estrada (2010), Pusser & Levin (2009) and Soares (2010).

[50] For evidence associating working with poorer college outcomes, see Bound et al. (2010), Jepsen et al. (2010), and Scott-Clayton (2010).

[51] Transitional employment most often has been provided as a pure employment strategy, but could be fashioned to be an initial step in a career pathway. For positive evidence on subsidized employment following training, see Bell & Orr (1994). On apprenticeships, see Lerman (2009, 2010).

[52] On problems of, and solutions to, complexity, see Rosenbaum et al. (2006), Sugar (2010) and Scott-Clayton (2011).

[53] See Jenkins (2005) on data, monitoring and evaluation in career pathways, Price & Roberts (2010) and Stephens (2009) for applications to statewide system change initiatives, and Leinbach & Jenkins (2008) and reports at http://www.aspenwsi.org/WSIwork-HigherEdpubs.asp for examples of career pathways "pipeline" analyses.

[54] On scaling up, see Center for Law and Social Policy (2010), Estrada (2010), Endel et al. (2011), Quint et al. (2011), and Visher et al. (2010).

[55] The program's chief developer, Ricardo Estrada has published a guide to bridge-focused career pathways programs based on the Carreras model (Estrada 2010).

[56] See Zeidenberg et al. (2010).

[57] See Roder & Elliott (2011).

[58] See Leinbach & Jenkins (2008) for an analysis framework for measuring momentum points and milestones.

[59] See Carnevale et al. (2011).

[60] Our categories assign to more specific domains the wide range of constructs often variously labeled as "soft skills," "life skills," "non-cognitive skills," "affective skills," or "non-routine skills." These headings often do not describe accurately the key constructs writers have associated with them, and many are too general to usefully guide theory and measurement.

[61] See Hughes & Scott-Clayton (2011). Robbins et al. (2004, 2006) find basic academic skills predict college success after controlling for psycho-social factors.

[62] David Conley defines "key cognitive strategies" as "intentional and practiced behaviors that become a habitual way of working toward more thoughtful and intelligent action." His list of such strategies includes: intellectual openness; inquisitiveness; analysis, reasoning, argumentation, and proof; interpretation; precision and accuracy; and problem solving. Under the heading of "academic behaviors," Conley identifies metacognitive skills required to reflect on and direct one's own learning processes and a range of more specific study skills, such as time management, note-taking, preparing for examinations, communicating with teachers/advisors, and using appropriate information resources (Conley, 2007).

[63] See Council of Economic Advisors (2009), Overtoom (2000), Secretary's Commission on Achieving Necessary Skills (1991) and skills identified for the federal Occupational Information Network (O*NET) at http://www.onetcenter.org/content.html.

[64] On personality, motivation and economic outcomes, see Barrick et al. (2001), Borghans et al. (2008), Colquitt et al. (2000), Dunifon & Duncan (1998), Almlund et al. (2011), and Le et al. (2010). On related psycho-social factors and college success, see Colquitt et al. (2000), Robbins et al. (2004, 2006) and Rosenbaum et al. (2006). On stability and potential malleability of personality, see Almlund et al. (2011) and Terracciano et al. (2010).

[65] See Goldrick-Rabb & Sorenson (2010), Long (2010), Fein & Beecroft (2006), Matus-Grossman & Gooden (2002).

[66] See Bound et al. (2010), Scott-Clayton (2010), Long (2010), Deming & Dynarski (2009), Navarro et al. (2007), Berker et al. (2003), Seftor & Turner (2002).

[67] See Hinckley & Hull (2007), Purnell & Blank (2004), and citations under "Other personal and family factors" below.

[68] See citations under "Other individual, family, and community outcomes" below.

[69] See Cutrona et al. (2005), Turner & Turner (2005), Turner & Avison (2003), Kessler (2002), Price et al. (2002), Vinokur & Schul (2002), Conger et al. (1999), Turner & Lloyd (1999), and Vinokur et al. (1996).

[70] See Cooper (2010), Scrivener et al. (2008), Engstrom & Tinto (2008), Conger et al. (1999), Vinokur et al. (1996).

[71] See review in Lee & Vinokur (2007), also Fein & Beecroft (2006), Matus-Grossman & Gooden (2002).

[72] Goldrick-Rab & Sorenson (2010) and Magnuson (2007) review literature on linkages between post-secondary education and child well-being and other life outcomes. Fein et al. (2003) summarize anecdotal reports from single parents that participating in a college bridge program enhanced parenting abilities related to children's schooling. Belfield & Bailey (2011) review evidence on community college and health status, welfare receipt, and criminal involvement.

[73] This section discusses potential indirect effects of career pathways programs on children arising through impacts on their parents. Such a representation is consistent with the typical focus on youth and adults in career pathways programs. Some programs also provide educational and other services to participants' children. The potential effects on children from such services operate through the pathway in our figure directly connecting program inputs to primary and other outcomes. A theory of change for two-generational career pathways models would develop this pathway in greater detail.

[74] Goldrick-Rab & Sorensen (2010, p. 1871) discuss related evidence on assortative mating.

[75] Although it is reasonable to posit better employment outcomes from post-secondary education and training when local job markets provide more opportunities in fields of study, we did not find much research related

to this topic. One meta-analysis (Greenberg et al. 2003) found no relationship with local unemployment rates for a set of voluntary, government-funded training programs studied from 1964-98. These programs generally involved short-term, sub-college level training and targeting relatively disadvantaged populations. On the other hand, a pooled analysis of data from welfare-to-work experiments found a sizeable negative relationship between impacts on earnings and local unemployment rates (Bloom et al. 2003). The results speak to average effects for a mix of work- and education-focused interventions targeting welfare recipients, however, and it is unclear whether similar results apply to post-secondary training for other populations of lower-skilled adults.

[76] For this reason, some experts have expressed reservations about moving too far to the relatively specialized training promoted in some career pathways programs and emphasized the need to strengthen approaches leading to broader educational skills and longer-term degrees.

[77] For an earlier discussion touching on some similar issues, see Kazis & Leibowitz (2003).

[78] For a summary of findings on outreach to stakeholders for the ISIS project, see Innovative Strategies for Increasing Self-Sufficiency Project (2009).

[79] See Richburg-Hayes et al. (2009) and Visher et al. (2008).

[80] Hybrids of these two general counterfactual situations also are possible. An example from ISIS is the VIDA program profiled earlier, which aims both to provide access to adults who otherwise would be unlikely to attend college and supports to college students at risk of not completing their programs.

[81] In addition to experiments designed to measure the net impact of a given career pathways approach, experiments comparing alternative approaches also may be informative. Possibilities range from comparing fairly narrow differences in specified components (e.g., different advising methods, varying levels of financial support) to comparisons of more fundamentally different career pathways models. Findings from such multi-treatment designs can be very helpful in informing decisions about program design, but without a "usual services" control group do not speak to the basic question of whether any of the investments left participants better off than they would have been otherwise.

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