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RSF: The Russell Sage Foundation Journal of the Social Sciences, Volume 4, Number 3, February 2018, pp. 118-143 (Article)

Published by Russell Sage Foundation



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We propose a two-generation anti-poverty strategy to improve the economic fortunes of children in the United States. Our policy bridges two traditionally siloed interventions to boost their impacts: Head Start for children and career pathway training offered through community colleges for adults. We expect that an integrated two-generation human capital intervention will produce greater gains than either Head Start or community

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college alone for developmental and motivational, logistical and financial, social capital, and efficiency reasons. We suggest a competitive grant program to test and evaluate different models using federal dollars. We estimate average benefit-cost ratios across a range of promising career fields of 1.3 within five years and 7.9 within ten years if 10 percent of Head Start parents participate in two-generation programs.

Keywords: poverty, Head Start, two-generation, career pathway training, child development

The economic fortunes of children in the United States are deeply concerning. One in five children are living in poverty (Child Trends Databank 2015a), and intergenerational economic mobility is harder than ever: only 10 percent of children born in the bottom quintile move to the top quintile when they are adults (Isaacs, Sawhill, and Haskins 2008; Sawhill and Reeves 2016). As we continue in the twenty-first century, our nation needs new anti-poverty policies and programs to promote the life chances of disadvantaged children.

Education is one of the strongest predictors of income in the United States. Incomes in highly educated families are three times larger than in families with low levels of education (Bradbury et al. 2015). This educational disadvantage compounds over generations and is more pronounced in the United States than in most other advanced industrial countries. The United States ranks near the lowest in its share of working-age citizens who surpass the educational attainment of their parents (OECD 2014). We also know that parents' education and income are significantly linked with children's educational achievement (Reardon 2011).

Given the strong association between parent and child human capital formation (Ermisch, Jantti, and Smeeding 2012), we argue for linking two traditionally siloed anti-poverty interventions with the goal of strengthening their impacts: early childhood education for children and career pathway training for adults (Chase-Lansdale and Brooks-Gunn 2014). These combined services are now referred to as two-generation human capital programs and are beginning to proliferate across the United States. Our proposed strategy uses Head Start as the child platform and community college as the parent platform. Head Start is the largest and only federally funded early childhood education program targeting low-income children through a whole-family approach, making it a promising component for testing a two-

generation anti-poverty intervention (Sommer, Sabol, Chase-Lansdale, and Brooks-Gunn 2016). Head Start has also been shown to be effective in promoting children's cognitive outcomes (U.S. Department of Health and Human Services 2010).

Community colleges (and their nonprofit, technical school counterparts) are increasingly serving student parents with similar sociodemographic characteristics to Head Start parents. Many parents in community colleges have young children, and 15 percent are single parents (Horn, Neville, and Griffith 2006). Although community colleges often have disappointing results in helping low-income student-parents overcome barriers and reach their educational goals (Goldrick-Rab and Sorenson 2010; Miller, Gault, and Thorman 2011), an expanding innovation in the field of job training programs—sector-based career pathway training—has shown promise for low-income adults. Sector-based career pathway training programs have positive impacts on educational persistence and certification and have the potential to improve earnings and income, especially when combined with financial incentives and wrap-around supportive services (Eyster, Anderson, and Durham 2013; Holzer 2009), although their effectiveness for parents is unknown.

Our idea is to promote the pairing of sector-based career pathway training for parents with Head Start programming for their young children in order to improve educational gains across generations and expand service effectiveness and efficiencies. A major goal of this essay is to bridge traditionally siloed theories and bodies of evidence—early childhood education for children and workforce development for parents—to support the premise that there is potential for two-generation programs to have large impacts on parents and children. We argue that two-generation programs would improve effectiveness of existing programs by si-

multaneously boosting educational outcomes for children and parents and subsequent earnings for parents, which is likely to have positive synergistic effects across generations. Intentional and intensive two-generation service partnerships can further promote these gains over light touch referrals that have not proven effective (Hsueh, Jacobs, and Farrell 2011). We conjecture that purposefully and systematically integrated two-generation programs will produce greater gains than Head Start or career training programs alone for developmental and motivational, logistical and financial, social capital, and efficiency reasons. We expand on each below.

The foundation of two-generation programs is the linked lives of parents and children. Children have much to gain when parents increase their education and income, including improved knowledge, skills, schedules, and financial resources, all of which directly benefit children (Chase-Lansdale and Brooks-Gunn 2014). From a motivation perspective, two-generation programs may inspire parents to succeed in meeting their own educational goals as they see their children succeeding in school. Children's positive experiences in Head Start have served as a motivator for parents to improve their lives (Gelber and Isen 2013; Love et al. 2013; Sommer et al. 2012). This may be especially true in two-generation programs that help parents see the vital connection between their own educational attainment and their children's (Caspi 2000; Knudsen et al. 2006; Sommer, Sabol, Chase-Lansdale, and Brooks-Gunn 2016). Moreover, parents serve as educational role models for their children, helping them develop their own academic and career identities as they grow. Two-generation programs could directly promote these linkages through the alignment of curricula that take into account that children and parents should each be understood holistically, as part of a family unit. Aligned parent and child curricula can expand parents' knowledge base in parenting and careers simultaneously.

Many of the obstacles to successful workforce development program completion among low-income families are logistical, including lack of access to regular, safe childcare, and financial support while parents attend school.

Using Head Start as a platform ensures that all children are taken care of during the day. Further coordinating parent and child school schedules can help parents ease the logistical burdens of managing work, school, and the care of young children. In addition, conditional cash incentives and tuition coverage for certification, preparatory skills training, and employment services can help reduce parental stress and financial worry and support their success in the program.

From a social capital perspective, colocation of parent and child services can improve social connection and support among families and service providers, accentuating their dual roles as parents and students (Small 2009). Joint programs improve the odds that parents will expand their social capital, which has been shown to help reduce attrition and increase parental engagement (Sommer, Sabol, Chase-Lansdale, Small, et al. 2016). Career coaches who individually support parents can serve as important informational resources and connect parents to the services they need most while also promoting connection among parents through regular structured meetings and specially designated college classes.

Two-generation programs may also increase service efficiencies. Programming at both community colleges and Head Start centers involve a range of supportive services, including academic and career counseling and coaching, childcare, and financial supports. Two-generation programs are in the position to target and streamline these services, drawing on specialized expertise and organizational structures already in place. Head Start centers are well equipped to help parents set goals for themselves and their families, offer emergency assistance and other financial supports, provide wrap-around childcare, and help families address a broad range of family needs (such as, housing and mental health services). Likewise, community colleges have expertise in occupational skills training, employment services, and academic supports. Two-generation programs intentionally align programming across organizations and reduce service duplication.

Our overall recommendation is to develop policy regulations and funding levers at the federal level that support further testing and eval-

uation of two-generation human capital models for low-income families. Strong theoretical support with limited empirical evidence motivates our proposed policy. We encourage the Administration for Children and Families (ACF) in the U.S. Department of Health and Human Services to serve as the lead agency and initiate a competitive grant process that will stimulate and evaluate the impacts of new models that offer intensive and quality services for each generation, leading to much needed research evidence. We are suggesting small grant applications that build on the evidence that early childhood education is largely effective for children and that career pathway models are largely effective for adults.

We start with a short history of two-generation approaches and how developmental science and economic theories support current two-generation approaches.

A HISTORY OF TWO-GENERATION APPROACHES

A two-generation approach pairing early childhood education and parent human capital development is not a new idea. One set of two-generation programs in the 1990s which Lindsay Chase-Lansdale and Jeanne Brooks-Gunn (2014) refer to as “Two-Generation 1.0” emphasized early childhood education combined with family support, parenting, family literacy, GED training, and access to public benefits. Another set of early programs involved helping parents, mostly teenage mothers, develop life skills, graduate from high school, attain employment, and reduce their dependence on welfare. For example, the New Chance Demonstration, the Learning Earning and Parenting Program, and the Teenage Parent Demonstration (TDP) showed some success in helping parents enter educational programs but had very few impacts on parents’ GED attainment or on children’s behavioral or social development (Granger and Cytron 1999).

These earlier versions of two-generation programs were limited by light touch services for one generation, thus missing many of the possible benefits of two-generation programs (for example, easing logistical burden for parents or building social capital). The motivation for most Two-Generation 1.0 programs was ei-

ther to promote parenting skills and family functioning to strengthen the impacts of early childhood education, or to add childcare as a work or school support to improve parents’ economic self-sufficiency. These interventions lacked the intensity and purposeful coordination of services for either parents or children, and the level of partnership needed to co-design service delivery to achieve impacts across generations (Chase-Lansdale and Brooks-Gunn 2014).

NEW TWO-GENERATION THEORY

Two-generation human capital programs today emphasize the interrelatedness of outcomes for parents and children, drawing on the rising application of multidisciplinary research and especially links between theories in developmental science and economics. Decades of research from developmental science demonstrates that parents are the primary influence on young children’s development (Bronfenbrenner 1979; Phillips and Lowenstein 2011), and that the parent-child dyad and home environment are the foundation for children’s healthy development (Gadsden, Ford, and Breiner 2016). Parenting practices and parent-child interactions play a critical role in fostering children’s cognitive, language, and socioemotional development (Sandler et al. 2012). Increasing parent human capital is likely to lead to improved cognitive stimulation in the home environment and parent-child interactions, which in turn will relate to children’s well-being and school readiness (Harding, Morris, and Hughes 2015).

Family investment theory suggests that as parents improve their education and get better jobs with higher earnings, they will have more financial resources to invest in their children (Oreopoulos and Petronijevic 2013; Kornich and Furstenberg 2013; Yeung, Linver, and Brooks-Gunn 2002). Families with greater economic resources are able to purchase more opportunities that are directly beneficial for children and youth, such as learning materials in the home (Foster 2002; Linver, Brooks-Gunn, and Kohen 2002; Waldfogel 2006; Yoshikawa, Aber, and Beardslee 2012). Additional income may also reduce stress at home and enhance parent psychological well-being and optimism, all of which are associated with improved family

functioning (Chase-Lansdale and Brooks-Gunn 2014; Conger et al. 2002; Yoshikawa, Aber, and Beardslee 2012). Parents with higher levels of education also tend to spend more time interacting with their children and better adapt this time to fit the developmental needs of their children, especially when compared to parents with lower levels of education (Guryan, Hurst, and Kearney 2008; Kalil, Ryan, and Corey 2012). Thus, supporting parents' development can potentially influence their skills and capacities as parents, students, and wage earners, which is likely to be directly associated with children's outcomes.

According to human capital theory (Becker and Tomes 1986; Heckman 2006), improving a child's or parent's skills and capacities leads to further skill development and capacity building, and from family systems theory, we know that such improvements can translate to positive benefits across generations within the same family (Cox and Paley 1997). Making these investments when children are young is likely to produce even greater gains for both children and their parents (Heckman 2006; Magnuson 2007), and these mutual benefits are likely to multiply across time. As the sociologist Sean Reardon has shown, children of parents with higher levels of education are likely to complete more years of school than their peers whose parents have lower levels of education (2011). New research from the economists Jorge Luis Garcia, James Heckman, and colleagues also suggests that high-quality early childhood education paired with increased parental education and earnings generate social mobility, and may produce significant savings to society in the form of lower rates of incarceration and reduced reliance on social benefit programs (2016).

HEAD START AS A TWO-GENERATION PLATFORM

Head Start is a logical platform for designing and evaluating two-generation human capital approaches because it is the longest running anti-poverty program for children in the United States and has served almost twenty-two million since its inception in 1965 as part of President Johnson's War on Poverty. Head Start enrolls almost one million preschool children with nearly \$8 billion in annual appropriations.

The program is currently administered locally through 1,700 Head Start agencies that provide services to about fifteen thousand Head Start centers with over forty-one thousand classrooms (Administration for Children and Families 2016a). Families are eligible for Head Start if they receive public assistance, are experiencing homelessness, or have family incomes below the federal poverty line (Child Trends Databank 2015b). Head Start now reaches 34 percent of children three to five years of age who are living in poverty (Child Trends Databank 2015b).

Head Start views itself as the original two-generation anti-poverty program for families. It has taken a whole-family anti-poverty approach over the past fifty years, seeking to improve the well-being of parents (mothers and fathers) and children. Yet Head Start has historically focused largely on fostering children's learning and social development through high-quality early childhood education in center-based settings (Zigler and Styfco 2004; Zigler and Valentine 1979). For parents, the most typical Head Start services include physical health, mental health, nutrition, and parenting programs as well as crisis management (Vinovskis 2008; Zigler and Valentine 1979). Supports for parents' human capital development are much less common.

Parents of children enrolled in Head Start face a number of challenges typically associated with poverty, including limited education and either unemployment or part- or full-time employment in jobs with little to no wage growth potential. Approximately 42 percent of parents of Head Start children have less than a high school education, 33 percent have only a high school or GED degree, 16 percent have some college but no degree, 7 percent have a technical certificate or associate's degree, and only about 5 percent have a bachelor's degree or more (Sabol and Chase-Lansdale 2015). In other words, only 12 percent of Head Start parents have the education needed to enter the skilled workforce.

Among Head Start participants in the nationally representative Head Start Impact Study, only 50 percent of mothers were employed—33 percent full-time and 17 percent part-time (U.S. Department of Health and Hu-

man Services 2006). The modal occupation among employed mothers was the service industry (56 percent), and only 4 percent of employed mothers worked in the health-care sector. Head Start participant fathers were employed at 84 percent (74 percent full time and 10 percent part time). The most common occupations for employed fathers were the services industry (27 percent) and the construction and extractive occupations (21 percent). Only 1 percent of fathers worked in the health-care sector (U.S. Department of Health and Human Services 2010). The household income of Head Start participants is likely to increase substantially if mothers and fathers move from unemployment to part-time or full-time employment and into middle- or high-skill in-demand service-sector jobs, such as health care.

At present, Head Start has strong interest in supporting parent human capital, but has limited infrastructure and support to do so. Among Head Start parents, only 10 percent are enrolled in job training services, 5 percent participate in English as a Second Language programs, and 14 percent receive adult education services through their children's Head Start center (Administration for Children and Families 2015; Sabol, Chor, and Healy 2017). Yet many parents seek such human capital services from Head Start or other early childhood education programs, leaving a large unmet demand (Sabol et al. 2017; Sommer et al. 2012).

Emerging evidence suggests that Head Start does have positive effects on parent and child human capital development. Drawing on the experimental Head Start Impact Study dataset, Terri Sabol and Lindsay Chase-Lansdale (2015) show that parents of children who are randomly assigned to Head Start versus other community early childhood education programs increase their educational attainment, particularly among those with some postsecondary educational experience. A comprehensive review completed by the Office of Planning, Research, and Evaluation under the U.S. Department of Health and Human Services (Puma et al. 2010) also demonstrated that Head Start has large and sustained impacts through elementary school, especially for children who are cared for in their or another's home (Zhai, Brooks-Gunn, and Waldfogel 2014), but these

impacts tend to diminish as children progress. Both effects could potentially be strengthened through more purposeful programming across generations. New legislation that requires full-day programming is one step in the right direction to improve program benefits for children and could be beneficial to parents as a comprehensive work or school support (Gibbs 2014). There is also on-the-ground momentum to further launch two-generation interventions but the approach has not been systematic or comprehensive.

Based on evidence from current model programs, we suggest a multipronged two-generation approach in three phases: career exploration, certification, and employment. Career exploration at Head Start centers supported by an expert career coach with small peer cohort meetings would help parents address their limited knowledge of educational opportunities, build social capital, and help them see the connections between their own learning and others'. Coordinated career training programs with Head Start services and wrap-around childcare would ease logistical burdens while helping parents achieve short-term certification leading to increased wages. Skills training, academic counseling, and employment services at community colleges would support educational advancement and post-training career employment (Attewell et al. 2009; Austin et al. 2012).

ADVANTAGES AND DISADVANTAGES OF USING HEAD START AS A TWO-GENERATION PLATFORM

The Office of Head Start's Parent, Family, and Community Engagement Framework and current Head Start grant funding encourages Head Start programs to support parents in advancing education and training toward careers and research institutions to study their impacts, suggesting strong institutional interest in two-generation human capital approaches (Administration for Children and Families 2013, 2016c). Moreover, the 2016 Head Start Performance Standards authorized by the Administration for Children and Families, the latest reform in almost twenty years, newly require that Head Start programs establish collaborative relationships and partnerships with other agencies and

programs, including workforce development and training programs, adult or family literacy, adult education, and postsecondary education institutions (Administration for Children and Families 2016b; Office of Head Start 2016). Our proposal incentivizes Head Start agencies to design and evaluate such partnerships largely through additional funding for two-generation innovation to answer whether two-generation collaborative strategies improve outcomes for children and parents beyond what each program can achieve independently.

Using Head Start as a two-generation base improves efficiencies and draws on existing service strengths and capacities. Head Start family support workers are required to conduct needs assessments to help parents set individual goals, many of which already include education and employment. Head Start centers are also well positioned to foster parents' social connections in ways that benefit parents and children (Sommer, Sabol, Chase-Lansdale, Small, et al. 2016). Most important, Head Start has a track record of on-site integration of services for parents and children, such as mental health programming (see Yoshikawa and Knitzer 1997), that go beyond simple referrals, putting the program in an advantageous position to implement two-generation strategies. This could include aligned parent and child curricula, dedicated classes and class placements at community colleges, and on-site meetings at Head Start, which foster parent social capital.

Adding parent career pathway training to Head Start services also presents several challenges. For example, Head Start center quality for children can vary widely along an array of dimensions, such as teacher-child interactions (Currie and Thomas 2000; Currie and Neidell 2007; Bloom and Weiland 2015; Love et al. 2013; Walters 2015). The proposed funding strategy suggests a competitive application process that would involve quality thresholds for services to children and parents. Head Start program standards already require centers to measure and report elements of structural and process quality. Quality assessment in workforce development services would likely include institutional characteristics such as access to credentialing programs that are valued by local employers and employment opportunities that allow for

increased earnings over time (Holzer 2009). Community colleges would be expected to offer employment retention services, and preference would be given to programs incorporating additional financial and supportive services of their choice given that we know little about the individual effectiveness of such services which are typically bundled (Martinson and Holcomb 2007).

Another possible roadblock is that families are enrolled in Head Start for only 1.25 years on average (Lee 2011), potentially offering too little time for parents to advance their human capital before children exit the program. Yet career pathway training programs offer a distinctive advantage in that they focus on short-term credentials that on average can be achieved in a year or less (e.g., medical assistant and computer network support). That Head Start enrolls older (three- and four-year-old) children also could be viewed as a disadvantage in that the program does not begin early in children's lives. Yet parents of younger children (that is, Early Head Start) may not be ready to add school to the care of infants, especially when also balancing work or when traveling long distances is involved, such as rural communities (Hsueh and Farrell 2012).

The types of collaborative relationships with community colleges that are needed to support a two-generation approach are also likely beyond the current resource capacity of Head Start programs. Supportive services to Head Start parents in the current model tend to rely on low-intensity referrals to community-based programs, thus involving fewer resources (Hsueh and Farrell 2012). Yet a grant process that offers significant additional funding is likely to incentivize Head Start centers to invest in the kind of intentional and intensive partnerships with community colleges necessary to design and test the value-add of paired services.

CAREER PATHWAY TRAINING AS AN INNOVATIVE HUMAN CAPITAL STRATEGY FOR HEAD START PARENTS

A new paradigm of workforce development programs has emerged that combine human capital development with job placement and supportive services in growing career fields. These programs are in direct response to two broad

structural changes in the U.S. economy: offshoring and mechanization. Since the 1990s, many low- and middle-skill jobs have moved overseas (Blinder 2009), and a significant proportion of traditional blue-collar manufacturing and service-sector jobs have become automated (Autor and Dorn 2013). These positions have been replaced by skilled and semi-skilled employment positions that are performed locally and in person (Blinder 2009). Health care is a prime example. The rapidly aging U.S. population has led to a huge demand for health-care workers with specialized certification (for example, certified nursing assistant, medical assistant, and licensed practical nurse). Other similar service fields include information technology (such as computer support specialist) and manufacturing (welder and certified machine operator), all growth sectors of the twenty-first-century economy.

Sectoral career pathway training programs are designed to offer training in such fields and meet the needs of local employers (King and Prince 2015). Students can earn stackable credentials in a specific field that provides a career pathway to increased earnings over time (Holzer 2009). The fact that most of these programs are low-cost, entry-level, and can be completed in under a year is especially advantageous to low-income families who need to gain a near-term return on investment of their limited time and resources while raising young children.

The last three decades have witnessed a large increase in the number of career pathway training programs, most of which are combined with supportive services such as career coaching, transportation assistance, and job placement and retention services. Sheila Maguire and her colleagues (2010) experimentally tested the impacts of three career pathway programs—Jewish Vocational Service-Boston, Per Scholas, and Wisconsin Regional Training Partnership (WRTP)—and found completion rates between 73 and 78 percent. The treatment effect on certification for WRTP and Per Scholas programs ranged from 22 percent to 45 percent, depending on the type of certification. Across all sites, earnings increased by \$4,000 and \$6,000 annually eighteen to twenty-four months after completing the program.

Richard Hendra and colleagues (2016) also

evaluated four workforce training programs, which together make up WorkAdvance: Per Scholas, St. Nicks Alliance, Madison Strategies, and Towards Employment. These programs had significant impacts on employment by targeted sector, ranging from 12 to 41 percent, but found mixed evidence of increased earnings. A range of quasi- and nonexperimental evaluations have generally found positive but mixed results regarding the impact of career pathways on earnings and employment by target sector (Gasper and Henderson 2014; Rademacher, Bear, and Conway 2009; Roberts and Price 2015). Evidence is accumulating that these programs can also produce longer-term earnings gains (Smith and King 2011). Given that these programs have focused on young, male and childless workers (Martinson and Holcomb 2007), we do not know how effective they would be for low-income parents of young children.

Evidence from the community college literature on postsecondary education persistence and completion suggests that incentives and in-kind assistance can help families maintain financial stability while pursuing advanced education (Deming and Dynarski 2010; Huston et al. 2001). Other strategies to increase college persistence have included small learning communities, tuition and fee remission, and travel and childcare subsidies (Bailey, Jeong, and Cho 2010; Brock and Richburg-Hayes 2006). These further reduce logistical and financial burdens to help parents support their families while they advance their careers. As both the economist Harry Holzer and sociologists Diana Strumbos, Donna Linderman, and Carson C. Hicks describe in this double issue, the City University of New York's (CUNY) Accelerated Study in Associate Programs (ASAP), which offers financial incentives (such as tuition waivers and textbook vouchers), modified schedules (for example, blocked and continuous development courses), and a range of supportive services (such as individual and group advising, embedded career development, and academic supports) is perhaps the most successful of the community college programs aimed at increasing persistence and graduation among community college students (Holzer 2018; Strumbos, Linderman, and Hicks 2018). In a quasi-experimental study, ASAP students experienced

graduation rates 25.6 percentage points higher than the comparison group (52.4 percent to 26.8 percent), and had increased graduation rates among African American and Hispanic males, as well as low-income students (Strumbos and Kolenovic 2016). The comprehensive array of services to address individual barriers is likely to have played a role in achieving impacts. Offering childcare on community college campuses is one strategy to reduce logistical burdens on parents. A number of Head Start centers across the country are testing the strategy of colocating childcare services on community college campuses, a potentially promising two-generation human capital strategy (Hoffman and Robins 2005).

ADVANTAGES AND DISADVANTAGES OF INVESTING IN CAREER PATHWAY TRAINING FOR HEAD START PARENTS

Sector-based career pathway certification training offers an innovative human capital strategy well suited to the needs of Head Start parents. These programs have been shown to be effective in helping adults improve their educational attainment and persistence and have the potential to raise earnings in the short- and long-run, both critical needs for low-income parents. Short-term credentialing also allows parents to enter and exit educational programming as financial circumstances require and according to the developmental needs of their children.

Community colleges are likely to gain from enrolling Head Start parents. These parents are better prepared for school given that they are already receiving quality, affordable care for their children and have the benefit of supportive services to address common barriers to completion (such as transportation and housing). Through Head Start participation, they also may have acquired skills and credentials that are likely to help them enter and advance more quickly in school (such as ESL or GED services) than students without these services. As a result, Head Start parents may have higher persistence and completion rates than other low-income students, an important benefit to community colleges as they are increasingly held accountable for student persistence and degree completion (U.S. Department of Education 2011).

The increased emphasis on work and employment in career pathway training, however, could be viewed as a limitation to this approach. One could argue that students from all economic strata should be encouraged to pursue AA and BA degrees, and that students who enter career certification programs miss out on the more traditional college experience (Rosenbaum 2001). Yet low-income student parents are likely to lack the financial resources needed to pursue a college degree while also raising young children. Moreover, participation in career pathway training may serve as a stepping-stone toward future college pursuits. Career certification programs also offer low-income parents the opportunity to develop skills that are likely to help them succeed in college, especially once they have increased family income and are raising school-aged children who need less childcare.

EMPIRICAL EVIDENCE FROM TWO-GENERATION HUMAN CAPITAL APPROACHES IN HEAD START

Experimental research on the effectiveness of two-generation human capital approaches is only just emerging, and most two-generation programs to date have been light touch. Two noteworthy evaluation examples from a base of Head Start (or Early Head Start) include the study of Enhanced Early Head Start (Hsueh and Farrell 2012) as part of MDRC's multisite Enhanced Services for the Hard-to-Employ Demonstration and Evaluation Project, and an evaluation of the effectiveness of the Community Action Project of Tulsa, Oklahoma's (CAP Tulsa) CareerAdvance program for parents of children enrolled in CAP Tulsa's Head Start centers (Chase-Lansdale et al. 2017). The first is an example of a light-touch approach. The second involves Head Start and community college partnerships, the intentional alignment and coordination of services for parents and children, and supportive services provided on-site at Head Start centers.

The Enhanced Early Head Start program specifically targeted parents of children from infancy to age three and helped them access local job training and education resources. The model largely involved referrals to other programs for services that parents were expected

to access on their own and did not include on-site educational programming for parents. An experimental evaluation of about six hundred families participating in Early Head Start services, half of whom were offered the education and workforce components and half of whom were not offered these services, showed no significant differences between treatment and control groups in parenting, employment, education, child development, or earnings three years after program start. Parents in the treatment group reported higher levels of psychological distress, possibly suggesting that raising expectations without producing results was stressful for parents. The low-intensity program model for parents combined with varying levels of expertise and comfort among the Early Head Start staff in supporting parent human capital are potential explanations for the lack of impacts. Additionally, some parents expressed interest in staying home with their very young children over enrolling in education and training programs, especially those in rural communities where available childcare and transportation were limited. These findings suggest the benefits of a two-generation approach that targets families with preschool-age rather than younger children, includes on-site services to parents, and involves service collaboration strategies across generations.

The CAP Tulsa two-generation model includes these elements and is distinctive in several ways. The CareerAdvance program is offered from a foundation of unusually high quality center-based early childhood education centers (Sabol and Pianta 2015; Sommer et al. 2015). Children enrolled in CAP Tulsa's Head Start centers, which also receive supplemental state pre-kindergarten funds, showed higher achievement and lower grade retention through eighth grade than children in parental or childcare (Gormley, Phillips, and Gayer 2008; Gormley et al. 2011; Phillips, Gormley, and Anderson 2016). The CareerAdvance program draws on many of the latest innovations in education and career training (only some of which have been rigorously evaluated). CareerAdvance focuses on career pathway programs in health care, a growth area or sector of the local economy according to a labor market analysis, that are likely to lead to higher earnings and more sta-

ble jobs (Holzer and Martinson 2008; Jenkins 2006; King 2014). The program also offers a sequence of "stackable" credentials linked with increasing wages through career advancement in health care (Audant 2016; King and Prince 2015). Benefits to parents include the ability to enter and leave employment and school as needed to achieve certification, practice skills, or improve earnings. Additionally, career pathway training programs give parents the flexibility to intermittently invest in their own education and pursue gainful employment while attending to the shifting time investments in their children across developmental trajectories. Likewise, CareerAdvance provides a range of supportive services for participants, including individual coaching and peer partner meetings that include knowledge and skill building for parents in their roles as students, workers, and parents (Sommer, Sabol, Chase-Lansdale, and Brooks-Gunn 2016).

The current evaluation of CareerAdvance examined the early effects of program participation on parent human capital among a sample of almost three hundred families. The study used quasi-experimental methods to estimate the average treatment effect of CareerAdvance combined with Head Start relative to families in a matched-comparison group who received Head Start services alone (Chase-Lansdale et al. 2017). The research design tested the added benefit of career pathway training for parents of Head Start children, not the effect of a two-generation program compared to either Head Start or career pathway training offered separately.

Parents in CareerAdvance had significantly higher rates of certification and employment in the health-care sector after one year in the program than the matched-comparison group. For example, CareerAdvance enrollees' rates of certification were 62 percentage points higher compared to the matched-comparison group. These results are especially remarkable given that comparison career pathway programs do not focus on low-income parents of young children who likely face a range of barriers to educational attainment and employment. For example, Mathew Maguire and his colleagues found treatment impacts of 34 and 22 percent in health-care certifications for nonparents

(2010). The CareerAdvance evaluation also found higher levels of commitment to work and career, self-efficacy, and optimism among the treatment group who participated in Head Start and CareerAdvance than among the comparison group who participated in Head Start alone. These findings suggest that the program is working as intended, developing parents' attachment to a career and a career identity, fostering the belief in their ability to achieve their goals, and leading to a positive outlook on their lives, all of which resulted in improved labor force outcomes (Chase-Lansdale et al. 2017).

COMBINING HEAD START SERVICES WITH CAREER PATHWAY TRAINING

Our policy proposal involves the Administration for Children and Families (ACF) in the U.S. Department of Health and Human Services leading a two-generation initiative to fund the development and evaluation of new partnership models across the country among Head Start agencies and community colleges (or non-profit technical centers). ACF is the logical lead agency: its mission is to serve both parents and children, it has service expertise in both generations and experience in on-site service delivery, and it already recognizes the value in testing two-generation approaches (Administration for Children and Families 2016c). These partnerships could also include the U.S. Departments of Education and Labor, which have demonstrated interest in the coordination of human capital services for parents and children, such as the Department of Labor's Strengthening Working Families Initiative (U.S. Department of Labor 2016).

The goal is to combine two innovative anti-poverty programs for parents and children into one policy. Our recommendation involves substantial new funding to Head Start agencies and community colleges that form intentional and strategic two-generation partnerships, incentivizing coordination, collaboration, and possibly colocation of services. At present, most Head Start programs do not have the structure to support parents in preparation for and participation in career pathway training, and most community colleges do not have the capacity to address many of the barriers faced by low-income parents, especially the lack of

quality, affordable care for their children when at school or work.

The purpose of the grant would be to support the development of model programs that could be evaluated and then scaled-up at lower cost. Grant applicants would have the flexibility to design partnerships in ways that are best suited to meet the needs of the communities they serve. We propose one prototype for our cost-benefit analysis based largely on CAP Tulsa's CareerAdvance program and the WorkAdvance program evaluated by MDRC, the two strongest examples of sector-based career pathway training programs with proven success. CareerAdvance is of particular interest because it is designed specifically for Head Start parents, whereas WorkAdvance serves low-income adults, most of whom were men.

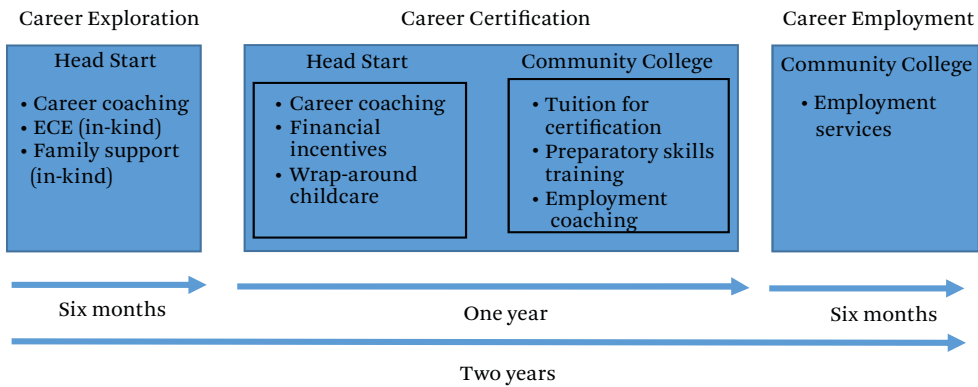
Target Population

Our proposal targets low-income parents already benefiting from Head Start's early childhood education services for children and supportive services for families and who are educationally prepared to benefit from near-term enrollment in career pathway training, specifically those who have a high school diploma, GED, associate's degree, career certification or some college (but did not receive a BA degree). Of the approximately 817,470 families with children that Head Start annually serves, 549,360 families (67 percent) include a parent who meets these educational requirements annually. Given that families participating in Head Start services on average include 1.4 parents, and assuming that both parents in a two-parent household have the same education level, 769,104 parents would be eligible for participation annually (U.S. Department of Health and Human Services 2014). Using the fact that about 10 percent of CAP Tulsa's eligible Head Start parents participated in its CareerAdvance program (Chase-Lansdale et al. 2017), we estimate that 76,910 Head Start parents would participate in our proposed two-generation human capital program each year.

Potential Model Program Services and Length

Drawing on best practices for parents and children, we propose a model that involves career

Figure 1. Potential Model Program Services and Length per Cohort



Source: Authors' compilation.

coaching, wrap-around childcare, conditional cash incentives delivered by the Head Start agency, tuition coverage for certification, preparatory skills training, and employment services offered at the community college. Wrap-around childcare is especially important given the lack of on-site childcare at most community colleges.

Conditional cash incentives for program attendance are important to maintain household income (which is already at the poverty level) when Head Start parents return to school.¹ Parents face the challenge of balancing employment, family, and school, in terms of both time and income burdens, and must decide whether and how much to work during training. Reductions in work hours are often necessary to accommodate parent classes and childcare schedules. We do not propose work prescriptions but rather program flexibility that supports family circumstances. Training programs targeting low-income mothers that emphasized work-first strategies have not been shown to be effective (see, for example, Hamilton 2002).

Using Head Start as a platform for parent programming takes the burden of coordination away from parents and intentionally offers most training and education services during the Head Start centers' hours of operation.

Wrap-around childcare services, which parents can navigate with the help of current Head Start family support staff who already know available community resources and are well versed in quality standards, will ease work-training-family conflicts further. Moreover, on-site childcare at community colleges, coordinated with Head Start services, would likely be most beneficial to families. Minimizing logistical challenges of all types is likely to have important implications for the ability of parents to participate fully in Head Start and career advancement services, and for children to attend Head Start regularly.

These services would need to take place over two years, possibly in three consecutive phases: career exploration (six months), career certification (twelve months), and career employment (six months). Figure 1 outlines the set of potential core program elements and a proposed period over which they could occur, providing a basis for our cost analysis. The goal is to estimate the costs and benefits of a prototype that balances effectiveness and efficiency.

Parents could enter credentialing programs in a variety of career fields according to the interests, skills, and life circumstances of the target Head Start population served, and the needs of local employers. We considered a

1. The proposed model includes estimated conditional cash incentives at a rate of 15 percent of average Head Start parent income (see Program Costs). We do not account for the fact that this benefit could increase program take-up beyond our estimated 10 percent, and could increase career training completion rates above our estimated 76 percent (see Program Benefits). Future evaluation efforts could experimentally test the effect of cash incentives on take-up and completion rates among program participants.

Table 1. Program Costs Over Five Years for Four Annual Cohorts of Participants

	Per Participant Cost	Total Program Cost (N=307,640)
Career certification		
Head Start supports	\$4,475	
Community college tuition	3,691	
Additional community college supports	3,974	
Career exploration		
Head Start supports	701	
Career employment		
Community college supports	1,114	
Total	13,955	\$4,293,116,200

Source: Author's calculations based on CAP Tulsa, personal communication, January 3, 2017; U.S. Department of Health and Human Services 2006, 2014; Hendra et al. 2016; Sabol et al. 2015; Tulsa Technical College 2017; Austin Community College 2017; Murray Career Institute 2017; Cape Cod Community College 2017; Daytona State College 2017; Highland Community College 2017; Santa Fe Community College 2017; Shawnee Community College 2017; Miami-Dade College 2017; Metro Technology Centers 2017; Tulsa Community College 2017; Lonestar Community College 2017; McHenry County Community College 2017; Clover Park Technical College 2017; Mt. Hood Community College 2017; Aims Community College 2017.

Note: Career exploration support includes six months of Head Start career coach and administrative program costs based on costs incurred by CAP Tulsa. Career certification costs include tuition (average cost across six credentials in healthcare, information technology, and manufacturing at a sampling of community colleges); additional community college supports (management and administration, recruitment and screening, occupational skills training, employment services) based on the MDRC evaluation of WorkAdvance (Hendra et al. 2016); and Head Start supports (administration, career coaching, wraparound childcare, incentives) (U.S. Department of Health and Human Services 2014; Sabol et al. 2015). Career employment support includes 6 months of community college employment services and administrative program costs based on average costs incurred during year 2 of program participation based on the MDRC evaluation of WorkAdvance (Hendra et al. 2016), with occupational skills training cost based on CAP Tulsa expenses.

range of positions across sectors, including health care, information technology, and manufacturing, and for which many community colleges across the country offer training certification. These programs vary in length, including certified nursing assistant (five months), computer support specialist (nine months), and welder (eighteen months), with an average of eleven months (rounded to one year for simplicity) across the six programs listed (see table A1).

In line with ACF's typical funding approach, we propose a five-year grant period in which new cohorts are added each year for four years, allowing all parents who enter the program to complete the two-year program during the

grant cycle. We would then expect 307,640 parents (76,910 parents per year for four years) to participate over the grant period.

Program Costs

We use the sample program model described to estimate costs (and forecast potential benefits).

Career Exploration

Costs for this phase-in period include career coaching and administration, namely salaries for a career coach and program staff, for a total estimate of \$701 per participant over six months based on CAP Tulsa expenses (see table 1). In-kind Head Start services in which families are

participating, estimated at about \$8,700 per family annually (Administration for Children and Families 2015), are not included in cost calculations.

Career Certification

Head Start supportive services during the credentialing period—career coaching, conditional cash incentives, and wrap-around childcare, including administrative costs—total \$4,475 per participant (see table A2). These are estimated based on CAP Tulsa’s CareerAdvance model (Sabol et al. 2015). One exception is conditional cash incentives, which CAP Tulsa provided through financial incentives totaling \$1,800 annually on average (Sabol et al. 2015), and which we suggest should be higher to account for the lost wages many parents experience when they add schooling to work and raising young children. Our estimate is \$2,523 per participant, or approximately 15 percent of the average annual earnings of a Head Start parent, or \$16,283 (U.S. Department of Health and Human Services 2010, 2014).

Average per participant tuition costs total \$3,691, based on data across a range of career pathway training credentialing programs offered in rural and urban communities of varying population size and living costs (see table 1, table A3). Grantees would need to conduct a local market analysis to determine which career credential programs to involve. Additional services per participant include preparatory skills training, employer engagement, and career retention and advancement, which are accompanied by administrative costs (such as participant recruitment and screening and program management), for a total of \$3,974 (Hendra et al. 2016).² The total annual per participant costs of community college career certification and supportive services equals \$7,665. In sum, we estimate the cost of the credentialing year to be \$12,140, approximately \$4,475 that will be administered by the Head Start agency and \$7,665 by the community college.

Career Employment

The final phase includes six months of employment services (\$280 per participant) and man-

agement and administration (\$834 per participant) for a total of \$1,114 per participant per year (Hendra et al. 2016).

Overall Program Costs

Across the two years of program participation, we estimate a per participant cost of \$13,955. Assuming 76,910 participants entering the program annually in each of four years, the total program costs are approximately \$4.3 billion (see table 1). Under a model that does not include conditional cash incentives, the per participant cost would total \$11,432, for an overall program cost of \$3.5 billion.

Program Benefits

Our focus in this analysis is on earnings gains of participants as the primary program benefit. For simplicity, other potential benefits to society are excluded (such as increased tax revenue and reduced use of social benefit programs). We use Head Start Impact Study data to estimate the average household income among Head Start families, inflated to 2015 dollars, and then draw on 2014 Head Start Program Information Report data on family composition and parental employment status to estimate the average Head Start parent’s income (\$16,823). To estimate participant earnings after program completion, we use Bureau of Labor Statistics data on annual earnings at the tenth percentile across six credentials in health care, information technology, and manufacturing as a proxy for a starting salary with a given credential. We use this lower-bound estimate so as not to be overly optimistic about earning potential in the short term. We estimate an overall average salary with certification of \$26,260. The estimated gain in annual income is then \$9,437 per participant (see table A4).

We follow participants for five years in estimating total program benefits, with the first two years serving as the program period. We assume that earnings benefits (the difference between the credentialed starting salary and the average Head Start parent’s annual income) begin accruing one year after career certification (or 2.5 years after program entry) and that 76 percent of participants achieve certification

2. Author’s calculations; personal communication, CAP Tulsa.

Table 2. Program Earnings Benefits

	Annual Earnings Benefits, Five-Year Window	Annual Earnings Benefits, Ten-Year Window
Year 1	\$0	\$0
Year 2	0	0
Year 3	582,645,549	275,805,762
Year 4	1,165,299,072	827,417,286
Year 5	1,747,948,608	1,772,206,188
Year 6	1,747,948,608	3,110,172,468
Year 7	1,165,299,072	4,172,332,986
Year 8	582,645,549	4,958,687,742
Year 9		5,351,865,120
Year 10		5,351,865,120
Year 11		4,013,898,840
Year 12		2,675,932,560
Year 13		1,337,996,280
Total (N=307,640)	5,510,839,475	6,991,786,458
Per-participant benefit	17,913	22,727

Source: Author's calculations based on CAP Tulsa, personal communication, January 3, 2017; U.S. Department of Health and Human Services 2006, 2014; Hendra et al. 2016; Sabol et al. 2015.

Note: Benefits during a five-year window are calculated as the difference between the average credentialed starting salary (10th percentile) for six healthcare, information technology, and manufacturing credentials and the average Head Start parent's income (U.S. Department of Health and Human Services 2006, 2014). Benefits begin to accrue 1 year after credentialing (or 2.5 years after program entry). Benefits during a five-year window are calculated similarly, with earnings assumed to increase to the average credentialed income two years after earnings benefits begin to accrue (U.S. Department of Health and Human Services 2006, 2014). Seventy-six percent of participants are assumed to receive credentialing based on rates observed at CAP Tulsa (Sabol et al. 2015).

and career employment (Smith and King 2011; Hendra et al. 2016; Sabol et al. 2015). The total per participant benefit is thus estimated at \$17,913 within the five-year window, for a total benefit across participants of \$5.5 billion with four program cohorts (see table 2). To better understand a participant's earnings trajectory over time, we also extend our analysis to allow parents to obtain the average credentialed salary (\$39,713) two years after earnings benefits begin (or 4.5 years after program entry), and follow each program cohort for ten years. The total per participant benefit within this ten-year window is estimated at \$110,025, for a total benefit across participants of \$33.8 billion.

Benefit-Cost Ratio

Given a per participant benefit of \$17,913 within a five-year window and a per participant cost of \$13,955 (assuming that costs of early childhood education are covered by the Head Start program), we estimate a benefit-cost ratio of 1.3. Expanding to a ten-year window and allowing for higher earnings over time, the estimated benefit-cost ratio increases to 7.9 (see table A5). We also conducted a similar analysis for each of the six credentials, assuming for each estimate that all participants enroll in a single credentialing program. After adjusting for differential program length, tuition costs, and earnings benefits, we find benefit-cost ratios

that range from 0.7 (welder) to 3.1 (certified nursing assistant) within a five-year window, suggesting that not all credentials would yield net benefits under the more conservative assumptions. However, under a ten-year window and allowing for earnings growth over time, we find that benefit-cost ratios are all greater than one, ranging from 6.2 (medical assistant) to 16.4 (computer support specialist).

Limitations and Extrapolations

Our analysis represents cost estimates of one proposed program model. Other innovative models are likely to involve a range of costs according to the targeted career sector and training certification field (and length), as well as the combinations of supportive elements and financial incentives or conditional cash incentives involved. Benefits may also vary depending on the average earnings among a targeted population of Head Start parents, the likelihood of certification and employment in the particular career field, and the value of earnings in the local economy. We also do not estimate the future earnings benefits to children, which are likely to result from improved educational outcomes among parents and children over the life course. Other excluded benefits include enhanced physical and psychological health of parents and children, increased tax revenue resulting from higher employment and earnings among participants, and reduced spending on public benefit programs and other services for parents who may be underemployed or unemployed without participation in a two-generation human capital program.

CONCLUSION

This article advocates for federal investment in two-generation human capital approaches as a way to reduce poverty among children in the near and long term. Theories in developmental science and economics, combined with limited but promising experimental evidence, motivate

our policy that intentionally and intensively pairs Head Start services for children with innovative career pathway training programs for parents. Two-generation programs have the potential to increase educational and motivational synergies among parents and children, reduce logistical and financial burdens for parents in workforce development or early childhood education programs alone, promote parents' social capital, and improve service efficiencies.

Current research evidence cannot tell us how much more effective quality career training targeted to low-income mothers and fathers will be when paired with quality early childhood education, and likewise does not tell us how much more effective early childhood education will be when combined with innovative career training programs for parents. However, recent research evidence from a model sector-based career training program targeted to Head Start parents, CAP Tulsa's CareerAdvance program, compares favorably, and in some cases better than, sectoral career pathway programs targeted to nonparents. Thus, we argue for further model testing under the direction of the Administration for Children and Families, U.S. Department of Health and Human Services as an essential first phase. Next steps would involve examining the impact of various program models, followed by their scale-up. Program variations to evaluate could include: comparisons of rural and urban settings, co-located and separately located Head Start services and community college programs, designated college classes for Head Start parents and integrated classes with other low-income students, the use and non-use of financial incentives and conditional cash incentives, and the location of wrap-around childcare at either Head Start or community colleges. The goal would be to test a range of approaches for achieving the greatest anti-poverty benefits for children and parents at the lowest cost.

APPENDIX

Table A1. Examples of Average Length of Career Certification Programs in Growing Labor Market Sectors

Healthcare	
Certified nursing assistant	5 months
Medical assistant	9 months
Licensed practical nurse	18 months
Information technology	
Computer support specialist	9 months
Manufacturing	
Welder	18 months
Certified machine operator	7 months
Average	11 months

Source: Tulsa Technical College 2017.

Table A2. Per-Participant Annual Costs of Supportive Program Elements to be Administered by Head Start

Program administration	\$603
Career coaching	798
Conditional cash incentives	2,523
Wraparound childcare	551
Total	4,475

Source: Author's calculations based on CAP Tulsa, personal communication, January 3, 2017; U.S. Department of Health and Human Services 2006, 2014; Hendra et al. 2016; Sabol et al. 2015.

Note: Administrative and career coaching costs are based on annual operating expenses of CAP Tulsa's CareerAdvance program. Administrative costs include salary for a program director and two staff members. Conditional cash incentives are calculated at 15 percent of the average Head Start parent's income (U.S. Department of Health and Human Services 2006, 2014). Costs of wraparound childcare are adjusted to represent costs incurred during one program year (U.S. Department of Health and Human Services 2006, 2014; Sabol et al. 2015).

Table A3. Exemplar Community College Per-Participant Tuition Costs Across Career Pathway Program Credentials

	Certified Nursing Assistant	Medical Assistant	Licensed Practical Nurse	Computer Support Specialist	Welder	Certified Machine Operator	Average
Tulsa Technical College (Tulsa, OK)	\$1,311	\$3,318	\$7,509	\$3,078	\$4,764	\$2,767	
Austin Community College (Austin, TX)	784	4,700	7,800		5,718		
Murray Career Institute (Marietta, GA)	520						
Cape Cod Community College (West Barnstable, MA)	580						
Daytona State College (Daytona Beach, FL)		2,907					
Highland Community College (Freeport, IL)		4,800					
Santa Fe Community College (Santa Fe, NM)			6,068				
Shawnee Community College (Ullin, IL)			4,653				
Miami-Dade College (Miami-Dade County, FL)				1,773			
Metro Technology Centers (Oklahoma City, OK)				2,300			
Tulsa Community College (Tulsa, OK)				2,920			
Lonestar Community College (The Woodlands, TX)							
McHenry County College (Crystal Lake, IL)							
Clover Park Technical College (Lakewood, WA)							
Mt. Hood Community College (Gresham, OR)						5,385	
Aims Community College (Greeley, CO)						4,758	
Average	799	3,931	6,508	2,518	5,156	3,234	\$3,691

Source: Author's calculations based on Tulsa Technical College 2017; Austin Community College 2017; Murray Career Institute 2017; Cape Cod Community College 2017; Daytona State College 2017; Highland Community College 2017; Santa Fe Community College 2017; Shawnee Community College 2017; Miami-Dade College 2017; Metro Technology Centers 2017; Tulsa Community College 2017; Lonestar Community College 2017; McHenry County Community College 2017; Clover Park Technical College 2017; Mt. Hood Community College 2017; Aims Community College 2017.

Table A4. Average Earnings Increases Across Credentials, 2015

	Average Starting Earnings	Average Earnings	Average Increase in Earnings When Achieving Credentialed Starting Salary	Average Increase in Earnings When Achieving Credentialed Average Salary
Healthcare				
Certified nursing assistant	\$20,040	\$26,820	\$3,217	\$9,997
Medical assistant	22,870	31,910	6,047	15,087
Licensed practical nurse	32,510	44,030	15,687	27,207
Information technology				
Computer support specialist	29,440	52,430	12,617	35,607
Manufacturing				
Welder	25,900	40,970	9,077	24,147
Certified machine operator	26,800	42,120	9,977	25,297

Source: Author's calculations based on U.S. Department of Health and Human Services 2006, 2014; U.S. Bureau of Labor Statistics 2017.

Note: Starting earnings are assumed to be the 10th percentile in earnings for individuals with a given credential (and averaged across six credentials in healthcare, information technology, and manufacturing) (U.S. Bureau of Labor Statistics 2017). Average earnings increases are given by the difference between the starting/average earnings for the average credential and the average Head Start parent's annual earnings (U.S. Department of Health and Human Services 2006, 2014).

Table A5. Benefit-Cost Ratios Across Credentials, Five- and Ten-Year Windows

	Certified Nursing Assistant		Medical Assistant		Licensed Practical Nurse		Computer Support Specialist		Certified Machine Operator		Average
Per-participant cost	\$6,839	\$12,083	\$20,997	\$10,670	\$19,645	\$9,274	\$13,955				
Total C (N=307,640)	\$2,103,796,140	\$3,717,137,210	\$6,459,363,260	\$3,282,441,890	\$6,043,433,980	\$2,852,899,540	\$4,293,116,200				
Benefits in five-year window											
Per-participant benefit	\$21,496	\$12,620	\$23,831	\$26,351	\$13,783	\$22,727	\$17,913				
Total benefit (N=307,640)	\$6,613,017,930	\$3,882,381,840	\$7,331,283,648	\$8,106,590,976	\$4,240,341,888	\$6,991,786,458	\$5,510,839,475				
Benefit-cost ratio	3.1	1.0	1.1	2.5	0.7	2.5	1.3				
Benefits in ten-year window											
Per-participant benefit	\$50,476	\$75,122	\$147,909	\$174,782	\$123,908	\$130,519	\$110,025				
Total benefit (N=307,640)	\$15,528,480,577	\$23,110,576,404	\$45,502,621,839	\$53,769,819,444	\$38,118,997,269	\$40,152,961,801	\$33,848,150,352				
Benefit-cost ratio	7.4	6.2	7.0	16.4	6.3	14.1	7.9				

Source: Author's calculations based on CAP Tulsa, personal communication, January 3, 2017; U.S. Department of Health and Human Services 2006, 2014; Hendra et al. 2016; Sabol et al. 2015; Tulsa Technical College 2017; Austin Community College 2017; Murray Career Institute 2017; Cape Cod Community College 2017; Daytona State College 2017; Highland Community College 2017; Santa Fe Community College 2017; Shawnee Community College 2017; Miami-Dade College 2017; Metro Technology Centers 2017; Tulsa Community College 2017; Lonestar Community College 2017; McHenry County Community College 2017; Clover Park Community College 2017; Mt. Hood Community College 2017; Aims Community College 2017.

Note: Per-participant costs are calculated as the sum of Career Exploration, Career Certification, and Career Employment costs. Career Exploration support includes six months of Head Start career coach and administrative program costs based on costs incurred by CAP Tulsa. Career Certification costs include tuition (average cost across six credentials in healthcare, information technology, and manufacturing at a sampling of community colleges); additional community college supports (management and administration, recruitment and screening, occupational skills training, employment services) based on the MDRC evaluation of WorkAdvance (Hendra et al. 2016); and Head Start supports (administration, career coaching, wraparound childcare, incentives). Phase-out Career Employment support includes six months of community college employment services and administrative program costs based on average costs incurred during year two of program participation based on the MDRC evaluation of WorkAdvance (Hendra et al. 2016), with occupational skills training cost based on CAP Tulsa expenses. Benefits during a five-year window are calculated as the difference between the average credentialled starting salary (10th percentile) for six healthcare, information technology, and manufacturing credentials and the average Head Start parent's income (U.S. Department of Health and Human Services 2006, 2014). Benefits begin to accrue one year after credentialing (or two and a half years after program entry). Benefits during a window are calculated similarly, with earnings assumed to increase to the average credentialled income two years after credentialing based on rates observed at CAP Tulsa (Sabol et al. 2015).

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