Navigating with the STARs

Reimagining Equitable Pathways to Mobility

STARs*
SKILLED THROUGH ALTERNATIVE ROUTES

Opportunity @ Work

Foreword

At Opportunity@Work, our mission is to unlock economic opportunity for the more than 70 million workers in America who have a high school diploma or GED but not a four-year college degree. We call these workers STARs because they are Skilled Through Alternative Routes. STARs have completed tech bootcamps, community college programs, and/or learned valuable skills through other workforce training, on the job, or serving in the military. Our March 2020 report *Reach for the STARs* defined and described STARs and demonstrated the value of their skills. We found that over 30 million STARs have the skills for jobs that pay, on average, 70% more than the jobs they are in today. Unquestionably, STARs across all races and regions represent a huge share of the talent and skill in the U.S. economy, a potential vastly underestimated and too often overlooked.

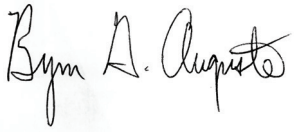
Navigating with the STARs looks at how STARs leverage their skills into jobs and careers that offer higher wages and upward mobility. We studied over 130 million job transitions over the past decade to understand how STARS make moves between jobs and how they achieve higher wages based on the skills they deploy on the job. Through this analysis, we seek to illuminate the barriers that impede STARS upward mobility and deprive employers of STAR talent. We identify almost 10 million jobs that STARs could fill annually if the labor market properly valued their skills.

"Understanding how and where STARs have skills to fill higher-wage work provides a blueprint to solve for both economic mobility and racial equity."

We also analyze the relationships of race and gender to job transitions and economic mobility and find that the barriers to mobility faced by STARs pose even greater obstacles to Black, Hispanic, and Women STARs. This suggests that inclusive skills-based hiring and talent development strategies would serve to unlock greater productivity in the workforce and promote gender and racial equity.

The future of work is upon us and an agile labor market that supports deployment of a worker's skills for maximum benefit to the workforce is essential. Understanding how and where STARs have skills to fill higher-wage work provides a blueprint to solve for both economic mobility and racial equity. And lest we forget, all of us need the talent, skills, and resourcefulness of STARs to solve the wide array of problems that is the work of the future.

Just as sailors once navigated the oceans with celestial stars, these findings suggest that labor market institutions designed to unlock the potential of over seventy million STARs will be adaptive, innovative, and more equitable. With STARs as our guides, employers and the workforce development field — training providers, policymakers, researchers, and investors — can take action, individually and collectively, to create a stronger and more equitable labor market. As we've seen during this pandemic, STARs show up every day to make our economy work. At this crucial moment for our country, it is time for our economy to work for STARs.



Byron Auguste
CEO and Co-Founder, Opportunity@Work

Executive Summary

In March 2020, Opportunity@Work published Reach for the STARs, a landmark study that identified over 70 million STARs, workers who are Skilled Through Alternative Routes instead of through a four-year college degree. We demonstrated that STARs have the skills and work experience to do higher wage work if they were given the opportunity. In this new report, we seek to identify the jobs and pathways that offer STARs upward mobility. We analyzed over 130 million job transitions to determine how workers move between jobs and how they achieve higher wages. We have three key findings that have tremendous implications for our efforts to create a more equitable labor market.

Finding 1:

Few STARs are Achieving Upward Mobility Despite having Skills for Higher Wage Work

Our analysis of job transitions shows that skills are the currency of the labor market. Using a measure of "skills distance,"[1] we demonstrate that skills required of a current job predict the movement of workers to their next job. However, we found that STARs are not able to leverage their skills for higher wage work the same way that workers with four-year college degrees do: only 39% of STARs' transitions led to an increase in wages. Over time, STARs make more transitions than their degreed counterparts and each transition carries a relatively high likelihood of wage decline. Wage gains, when they occur, are smaller. Across their job trajectory, these differences accumulate, leaving STARs well behind. These trends run counter to the notion that workers can work their way up an economic ladder by translating their on-the-job learning to higher wage work.

Finding 2:

Some STARs Achieve Mobility through a Number of Promising Pathways

We studied the transitions that STARs did make to higher wage jobs and found that they achieved wage gains in a specific set of jobs. Among those jobs, we identified 51 that we termed "Gateway" jobs because they open a pathway to upward mobility to STARs. A Gateway job (for example, Customer Service Representative) is accessible from many entry level jobs (such as Tellers, Cashiers, and Couriers) and helps the worker build a skill set to achieve a higher wage job (such as a Manager or Sales Representative). This promising pathway from entry level origin job to Gateway job to higher wage destination job offers a template for upwardly mobility.

Finding 3:

Black, Hispanic, and Women STARS are Underrepresented on the Pathways that Offer Mobility

While STARs carved out a number of promising pathways through Gateway jobs, even these promising pathways are not uniformly accessible. STARs represent only 41% of the workers on these pathways even as they represent 51% of the labor market. Our data show that Black and Hispanic STARs and women STARs see less mobility than white and male STARs on these pathways. Overall, they are less likely to make transitions to higher wage jobs, and when they achieve transitions, they are less well compensated for their skills. There is significant work to be done towards building promising pathways and making them accessible to all workers.

Call to Action

Our research underscores inequities in the labor market that harm workers, but it also shows a way forward. With intention, we can broaden pathways and facilitate STARs' access to higher paying jobs. Specifically, we can eliminate barriers to existing jobs and we can structure newly created job categories in burgeoning fields to be more accessible to STARs.

What Employers Can Do

Leverage your jobs to open pathways. If you are an employer, you can take action based on the jobs and skills deployed in your business. If you are an employer with STARs in lower-wage origin jobs from which STARs gain skills and can achieve higher wage jobs, define a skills-based pathway to higher wage work for them. If you are an employer with many middle-wage roles, open those roles to STARs. If you are an employer with a new-to-world role, use the Gateway job concept to design this role to facilitate entry for STARs.

Contribute to the infrastructure for promising pathways. Partner with other employers, training organizations, and others in the workforce field to facilitate job transitions across companies and industries. Support access to wraparound services, such as childcare and transportation, to minimize barriers to STARs' mobility.

Update your employee value proposition. A core talent acquisition and retention strategy is ensuring mobility for your workers. Create the pathways to higher paying jobs and communicate that proposition effectively to ensure your workers know that they have a path to higher wages by coming to work for you.

As we emerge from our current crisis, we have an opportunity to reimagine a more equitable labor market. This report offers a path forward. A workforce that works for STARs is a workforce that offers opportunity to all workers.

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Introduction

At the beginning of 2020, employers and the workforce training field were focused on a response to automation and its predicted impacts on jobs, the workplace, and workers. The COVID-19 crisis increases the urgency of this work. Workers are losing their jobs in frightening numbers across large swaths of the economy and struggling to maintain stability. Workforce organizations are rapidly aligning their training efforts toward skills that will be in demand post-recovery. And employers are restructuring their staffing and operations to address shifts in demand, changes in business processes, and an increasingly virtual workforce.

These changes are taking place in an environment with heightened awareness of economic inequality and racial inequity in the workplace. Employers are responding to pressures to address a broader social movement and increase the diversity of their teams. They need to find new ways to source for and fill roles in a time of job contraction and uncertainty. Recovery from this economic downturn represents an opportunity to address past inequities, while carrying real risks of exacerbating them.

Any serious discussion of an equitable recovery must include STARs, workers who are Skilled Through Alternative Routes instead of through a bachelor's degree. They make up half the workforce and two-thirds of workers deemed essential in the COVID-19 response.[2] STARs earned 13% less than the previous generation before this current crisis even began,[3] and they are bearing the brunt of the economic crisis of the moment. Our prior work demonstrates that they have enormous and overlooked talents that can and should be leveraged in our recovery.

This report presents insights to enable an equitable recovery that provides upward mobility for STARs. We analyzed over 130 million job transitions made by workers and present three key findings. First, we share evidence that there are two labor markets for upward mobility: one for STARs, and one for workers with four-year college degrees. As employers increased education requirements for jobs in the past few decades, they have excluded STARs from an increasing share of their middle- and high-wage workforces, leaving behind many who have tremendous talents and skills. Second, we show that despite the barriers to higher-wage positions, STARs have experienced mobility through transitions to about 300 jobs.[4] Finally, we document that this journey to mobility is harder for STARs who are Black or Hispanic and STARs who are women.

These insights on jobs and mobility allow us to reimagine a workforce system that allows workers to translate their skills into higher earnings and strengthens our collective pursuit of the American Dream of economic opportunity for all.

STARs are workers who are Skilled Through Alternative Routes. Each of these workers has been active in the workforce in the past year, has a high school diploma or equivalent, and does not have a four-year bachelor's degree. In total, there are more than 70 million workers who do not have a college degree but have developed skills through alternative routes such as community college, apprenticeships, bootcamps, and most commonly, on-the-job. STARs represent 51% of the U.S. workforce and are a diverse pool of workers: 62% of Black workers are STARs, 55% of Latinx workers, and 50% of whites. 66% of rural Americans and 62% of Veterans are STARs.

Finding #1

Few STARs are Achieving Upward Mobility Despite having Skills for Higher Wage Work

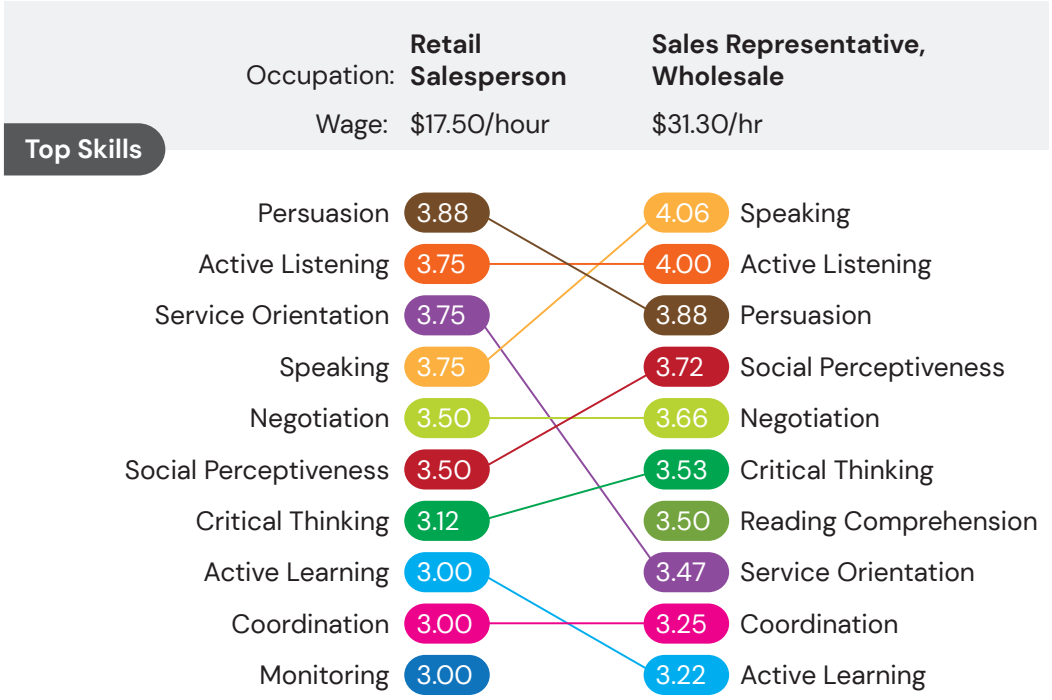
STARs have valuable skills. Our earlier work analyzed the largest public datasets on U.S. occupational roles, skills, wages, and workers to identify the more than 70 million workers who are Skilled Through Alternative Routes (STARs). We compared the skills required for STARs' occupations to all other occupations in the labor market and found that the majority of STARs have skills, based on their current job, to transition to a higher paying job. Figure 1.1 illustrates one pairing of a low-wage origin and a middle-wage destination job with similar skills.

Skills are the currency of the labor market. Our analysis of job transitions shows a clear relationship between the skills of a worker and job transitions made in the labor market. Specifically, the more similar the skills (measured by "skills distance"), the more likely the worker will transition from one job to another. Skills are a reliable predictor of movement from one job to another.

And yet, when STARs make job transitions, they cannot access higher wage jobs the same way that workers with college degrees do. While our skills analysis shows that STARs have the skills for higher paid work, our analysis of job transitions reveals that they are not filling these roles. STARs are making job transitions in high numbers — STARs account for more than their representative share of movement in the labor market — but their transitions do not result in meaningful wage gain.[5] Of the 79.5 million job transitions that STARs made from 2010-2019, only 39% led to an increase in wages of 10% or more. Of the other transitions, 23% were lateral moves with no significant wage gain, and a stunning 37% led to lower wages. Transitions are even harder for middle-wage STARs; only 23% of transitions made by middle-wage workers yielded higher wages.

FIGURE 1.1: SKILLS DISTANCE ACROSS TWO SALES ROLES

Many STARs have the skills today to do higher wage work

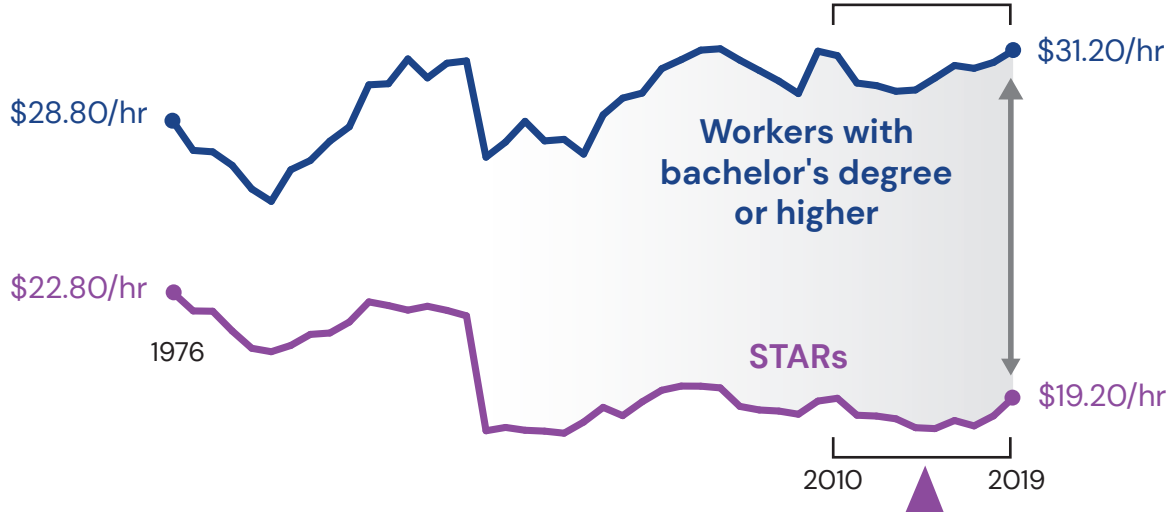


This figure shows the high skills overlap between two sales roles. The first is accessible to STARs, while the second is less so. About 160,000 STARs have made this transition in the ten year period we studied.

Our two labor markets. These numbers reveal a particularly steep climb for STARs. STARs typically start at lower wages compared to workers with bachelor's degrees. Over time, they make more transitions than their degreed counterparts and each transition carries a relatively high likelihood of wage decline.[6] Wage gains, when they occur, are smaller. Over time, these differences accumulate, leaving STARs well behind as illustrated in Figure 1.2. These trends run counter to the notion that workers can work their way up an economic ladder by translating their on-the-job learning to higher wage work. They tell a story of workers who have to make a series of moves to achieve mobility, and are quite likely to lose ground as they do. The relationship between learning and earning is hardly secure for STARs.

FIGURE 1.2: MEDIAN WAGES FOR STARS AND WORKERS WITH BACHELOR'S DEGREES SINCE 1976

The wage gap has increased between STARs and workers with bachelor's degrees



Median hourly wages, 2019 dollars

STARs made 79.5 million job transitions from 2010–2019. **Only 39% led to an increase in wages** of 10% or more. 23% were lateral moves, and 37% led to lower wages

STAR STORY: BARBARA

Doing the Job without the Degree

Role: Family Support Specialist and Program Coordinator

Coming of age during the Civil Rights Movement, Barbara was one of six Black students to desegregate her college. The pressures of being a young mother in an inhospitable environment forced her out of college and she worked in factory jobs to make ends meet. Outside work hours, she began to volunteer at an urban ministry center and at a women's resource center to build her skills for a better job. Her work delivering services and starting support groups helped her find a government job. Though she did not particularly enjoy it, she stayed for 12 years because it offered the income and stability she needed to take care of her family and pursue her interest in child mental health advocacy.

When her own daughter had a mental health crisis, Barbara redoubled her commitment to children's mental health care, and left her job to start a non-profit to support families of children with special needs. "So I went from being really focused on children's mental health to opening up a really strong organization to advocate for any family with special needs." Barbara learned all aspects of running an organization from writing grants to making payroll. Now, with over 20 years of experience as a child and family advocate for children who have mental illnesses, developmental disabilities, and other special needs, she is a respected advocate, trainer and facilitator, recognized in the State of North Carolina and beyond.

Barbara emphasizes the personal nature of the experience she brings to this field. "I connect so strongly with family experience and with parent experience based on my own personal experience with the hundreds and thousands of families that I have interacted with over the course of my 35 year career."

"Although I do not have a degree in psychology or a degree in social work, my life experience provides me with an expertise that is complementary to service providers."

RELATED LITERATURE:

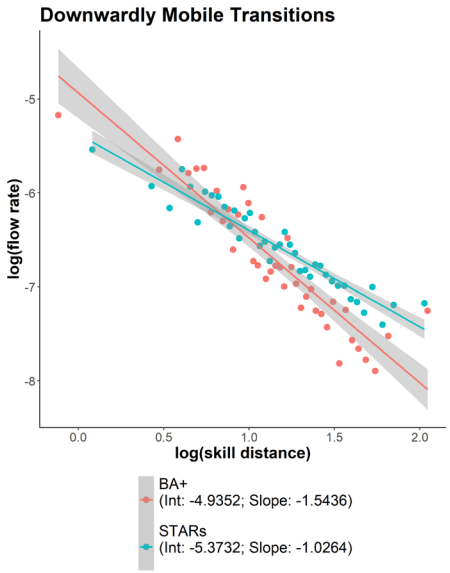
STARs and Workers with Bachelor's Degrees Experience Different Transitions in the Labor Market

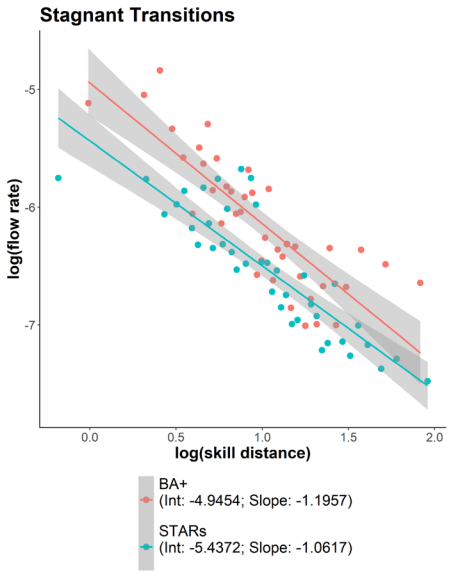
In our paper, "Work Experience Works as a Job Market Signal," (Blair, Debroy, Heck 2020) we compare the job transitions made by STARs with those made by workers with a bachelors degree and additional post-secondary education. We study over 130 million worker transitions since 2010, and 21,472 unique origin-to-destination occupation transitions in that time period.

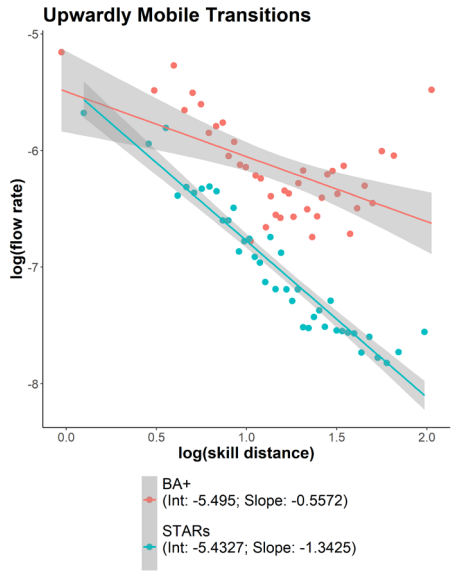
We divided the transitions for workers with bachelor's college degrees and STARs into three categories reflecting the transition's impact on wages — downward, stagnant, and upward.

The graphs below quantify the relationship between movement in the labor market and skill distances for workers with bachelors' degrees or more post-secondary education (BA+, in red) and for STARs (in blue).

In the first two graphs, we see a robust relationship between skills distance and transitions for downwardly mobile and stagnant transitions. This suggests skills are the currency that workers are using to make transitions to other jobs in the labor market. The third graph shows a divergence from this pattern. For upwardly-mobile transitions, we see that STARs continue to make transitions of similar skills distance, but workers with bachelor's degrees have a less steep slope and much higher dispersion, demonstrating their tendency to make transitions to jobs with a higher skill distance than STARs. Workers with bachelor's degrees are less constrained by their skills, and thus have many more opportunities than STARs. The theory presented is that the bachelor's degree serves as a signal that STARs do not have access to — further impeding their mobility. This inability to signal beyond skills in their current job thus contributes to this inequality STARs experience in the labor market.







Note: To simplify the presentation of the data, we use a binned scatter plot in which the x-axis is divided into 40 bins by its empirical distribution. As a result, each point represents 2.5% of the data.

Finding #2

Some STARs Achieve Mobility through a Number of Promising Pathways

STARs achieve wage gains through transitions to certain destination jobs. From 2010 to 2019, STARs made 79.5 million transitions. Only 31 million, or 39%, yielded higher wages. We took a closer look at these upwardly mobile transitions to identify the origin jobs where the STAR started and the destination jobs where they achieved the higher wage. While STARs made thousands of unique origin-to-destination transitions to higher wages, they landed in 292 destination jobs. The vast majority of the transitions to higher wages were from low-wage jobs to middle-wage jobs. Only 24 of the 292 destination jobs were the result of transitions from middle-wage to high-wage destinations jobs. For a list of the highest volume of STAR transitions to higher-wage destination jobs, see Table 2.1. Additional data on these transitions is available in the Appendix.

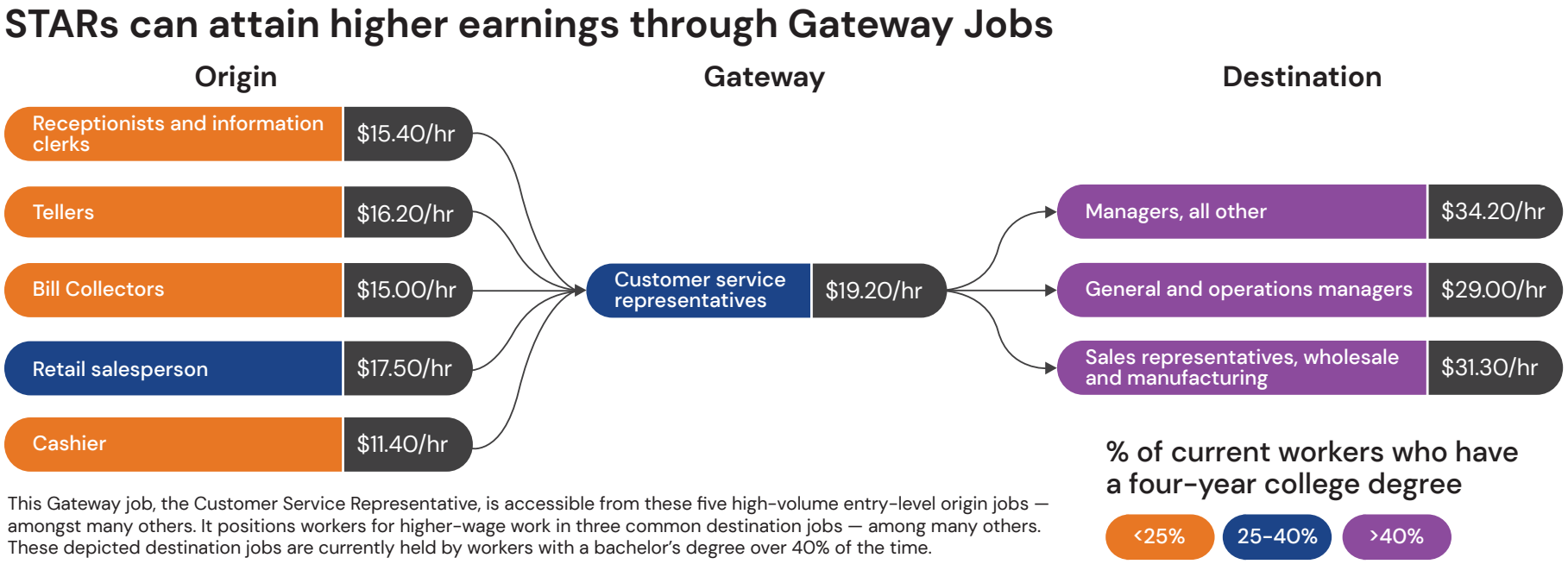
TABLE 2.1: DESTINATION JOBS FOR STARS

Destination Occupations	Number of STAR Transitions into this job (2010 - 2019)	Destination Occupation Median Wage	Median Wage Gain	Most Common Origin Occupation
Middle-wage Destination Occupation				
Driver/Sales Workers And Truck Drivers	1,087,322	$19.23/hour	$4.40/hour	Laborers And Freight, Stock, And Material Movers, Hand
Customer Service Representatives	516,705	$19.23/hour	$4.90/hour	Receptionists And Information Clerks
Secretaries And Administrative Assistants	416,389	$19.23/hour	$4.90/hour	Stock Clerks And Order Fillers
Managers, Nec (Including Postmasters)	344,044	$34.21/hour	$19.80/hour	Food Service And Lodging Managers
First-Line Supervisors Of Sales Workers	319,302	$21.63/hour	$6.70/hour	Cashiers
High-Wage Destination Occupation				
Computer Scientists And Systems Analysts/Network Systems Analysts/Web Developers	214,729	$37.18/hour	$4.90/hour	Computer Support Specialists
Chief Executives And Legislators/Public Administration	188,398	$57.69/hour	$31.30/hour	General And Operations Managers
Management Analysts	184,391	$38.86/hour	$12.30/hour	Human Resources, Training, And Labor Relations Specialists
Managers In Marketing, Advertising, And Public Relations	140,242	$37.02/hour	$12.30/hour	Administrative Services Managers
Software Developers, Applications And Systems Software	87,018	$48.08/hour	$23.10/hour	Computer Support Specialists

Fifty-one Gateway jobs improve mobility for STARs. Among the 292 destination jobs that provide wage gain for STARs, we identified 51 jobs that we term "Gateway" jobs. We use the term "Gateway" because these jobs open opportunities for upward mobility. Gateway jobs offer a significant wage increase from the prior origin job and, in turn, can also lead to higher wage destination jobs. We observe large numbers of STAR transitions into Gateway jobs from origin jobs that are held by a large number of workers, as well as significant numbers of transitions from the Gateway job into higher wage destination jobs. Our skills analysis suggests that Gateway jobs give workers needed skills to facilitate this upward mobility.[7]

Figure 2.1 provides just one example: Many common entry level jobs — Cashier, Tellers, Clerks — can transition to one particular Gateway job — Customer Service Representative — that, in turn, opens doors to destination jobs that have similar skill sets but higher wages — such as Insurance Sales Agents and Sales Representatives. Our list of observed Gateways jobs includes jobs that employ high numbers of workers such as Customer Service Representatives, Computer Support Specialists, and Licensed Practical Nurses, and Licensed Vocational Nurses. A list of the full 51 Gateway jobs is provided in the Appendix.

FIGURE 2.1: SALES PATHWAY THROUGH A GATEWAY JOB



This Gateway job, the Customer Service Representative, is accessible from these five high-volume entry-level origin jobs — amongst many others. It positions workers for higher-wage work in three common destination jobs — among many others. These depicted destination jobs are currently held by workers with a bachelor's degree over 40% of the time.

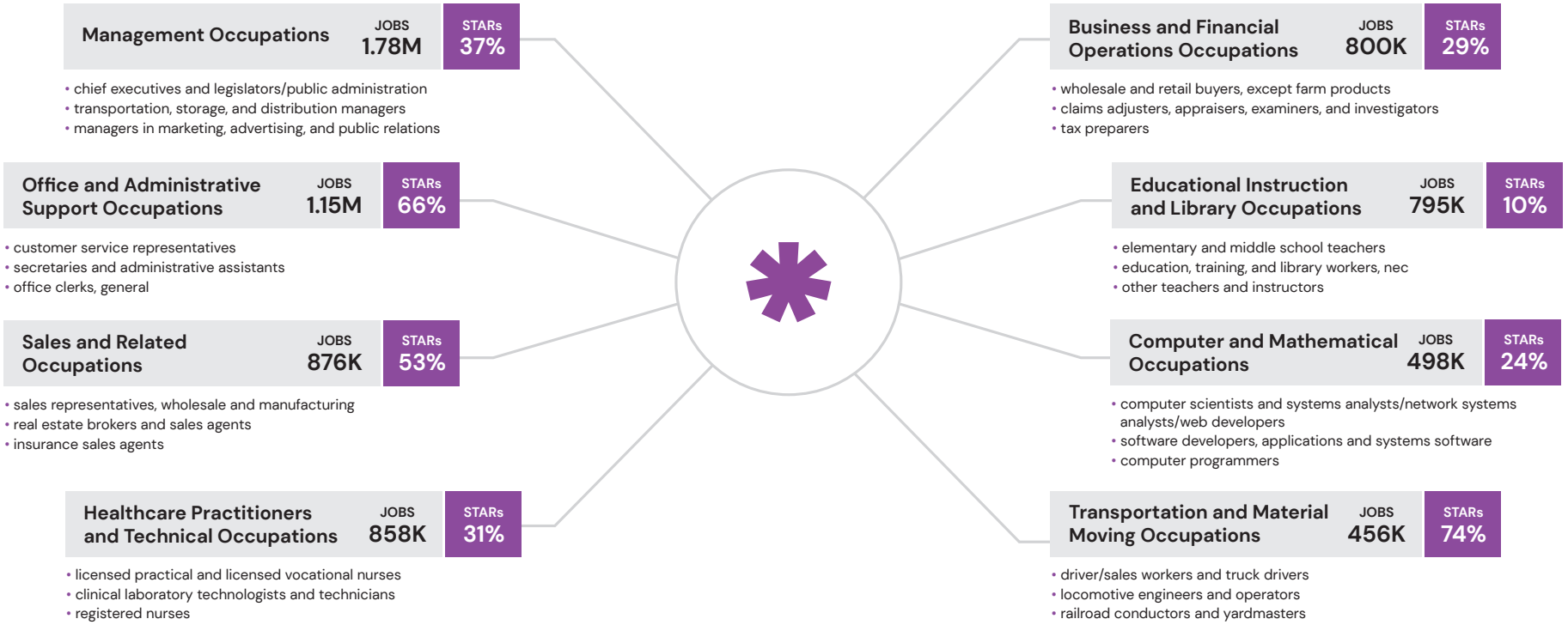
These jobs and pathways could provide mobility opportunities for tens of millions of STARs. STARs achieved these higher wage destination occupations through a variety of pathways. Generally, the transitions were of relatively low skills distance (see the Appendix for the detail), underscoring the value of skills learned on the job. For some destination jobs, such as nurses and machinists, STARs leveraged training or certifications to achieve a transition with a higher skills distance. Facilitating such transitions could help more STARs garner wage gains.

These roles present an opportunity for STARs, especially if employers draw more actively from the STARs talent pool. Our data show that of 93 million workers in these 292 destination occupations, STARs represent 41% of these roles, even as they are 51% of the labor force.

These 292 occupations are projected to experience a turnover of 9.9 million jobs annually. Further, these occupations are projected to add 2.2 million positions over the next ten years.[8] Figure 2.2 shows the job families in which the highest volume destination jobs STARs achieved reside. How many STARs could achieve mobility if we were to remove barriers and fill a high number of these jobs with STARs?

FIGURE 2.2: PROJECTED ANNUAL TURNOVER IN STARS DESTINATION JOBS

Every year, almost 10 million jobs open on promising pathways. What if STARs filled more of them?



This figure highlights the highest volume destination jobs for STARs in each of these job families, with examples of roles STARs could fill in high volumes. For each job family, we show the total volume of destination jobs and the percentage of STARs that currently occupy those destination jobs. Using Bureau of Labor Statistics data, we calculated the total number of jobs turning over in these destination jobs to estimate the 10 million job openings across these pathways.

STAR STORY: ERIKA

Technical Skills Provide Gateway to Job in Manufacturing

Role: Quality Assurance Technician

Erika is a quality assurance tech at a manufacturing plant, where she is the final pair of eyes that inspects the motor before it leaves the plant. Erika has been interested in welding and engineering from a young age, when her father and grandpa would bring her into their shop. When she graduated from high school, Erika knew she wanted to be an engineer, but she also wanted a physical skill to fall back on before going for the degree.

Though she was a skilled welder, Erika had to learn a lot of technical skills when she started at the manufacturing plant. "I learned how to connect, braze, lash, and motor. I learned how to surge test the motors. And then I learned [how to operate] one of the machines that physically winds and puts the copper coil into the motor." She did her job so well, she became a quality assurance tech.

Erika's job requires a high level of coordination between different departments and individuals. "You have to work with the person behind you. I work in a production facility, so the two positions behind mine would be nameplates and paint. So if they're wanting to go slow on the painting or they're having an off day anyway, you kind of have to help perk them up to encourage them." Because she works second shift, Erika is also responsible for communicating with first shift engineers, to ensure smooth transitions between shifts. Erika identifies attention to detail, good communication, and teamwork as the most important skills she depends on every day.

Though she has been professionally successful, Erika has had to prove herself over and over as a young woman and a working mother in manufacturing. She says, "It takes a lot for people to overcome their own mentality of what they perceive you to be. So they think, 'Oh, she's just a young 26 year old. It takes a moment for them to realize, okay, no, she's in this position cause she's serious.'"

"I knew if had a physical skill, no one could take it from me."

RELATED LITERATURE:

Job Opportunities for Workers without Bachelor's Degrees

Much scholarship documents that the U.S. labor market makes well-paid jobs significantly less accessible to STARs than workers with bachelor's degrees. 74% of new jobs created in the labor market are jobs where employers frequently require a bachelor's degree (Blair et al., 2020), and one assessment shows that almost three quarters of jobs that offer good pay and stability are held by people with bachelor's degrees (Carnevale et al., 2018). While college is often touted as the great equalizer, paving the way for job opportunities and economic mobility, a college education is not accessible to many Americans. (Marina & Holmes, 2009). Furthermore, even among those who obtain college degrees, disparities in labor market outcomes persist (Gaddis, 2015).

Even in areas where STARs could have better access to jobs, they are limited. Many jobs that pay at least the national median wage and that offer opportunities for wage increases and mobility are available to STARs — but the number of these jobs is limited, and additional barriers exist for these workers. (Wardrip et al., 2015; Lamback, Gerwin, & Restuccia, 2019; Shearer & Shah, 2018). For example, many employers express a preference for workers with bachelor's degrees in online job ads even if a degree isn't a necessary qualification for the job (Fee, Wardrip, & Nelson, 2020).

The literature does, however, highlight some bright spots. The number of good jobs in certain industries is growing and may continue to do so despite innovations and automation in the economy (Institute for Women's Policy Research, 2019). Some of the most promising industries for workers without bachelor's degrees include healthcare and information technology (Fee, Wardrip, & Nelson, 2020). Securing these jobs can require additional training, such as a certificate or an associate's degree, but gaining these skills-based credentials can provide pathways to better-paying jobs and opportunities for career advancement (Carnevale et al., 2020). Policies and programs that aid workers in obtaining these skills also help to close gender- and race-based wage gaps, leveling the playing field for workers from marginalized groups who are less likely to have access to, and may be less likely to access the benefits of, bachelor's degrees (Blair & Chung, 2020).

74% of new jobs created in the labor market are jobs where employers frequently require a bachelor's degree.

Finding #3

Black, Hispanic, and Women STARS are Underrepresented on the Pathways that Offer Mobility

Black and Hispanic STARs make more job transitions for less wage gain than white STARs. We examined the subset of job transitions that yield wage gains for STARs and observed striking differences by race. First, Black and Hispanic STARs start at a disadvantage, making lower wages than their white counterparts when they begin their transition. Table 3.1 shows that more than half of Black and Hispanic STARs start in low wage origin jobs while among white STARs fewer than half are starting in this position. Further, we see that Black and Hispanic STARs make upward job transitions of shorter skill distance than their white counterparts suggesting white STARs are less constrained by their skills, and thus have more opportunities than Black and Hispanic STARs. One result is that about half as many of Black and Hispanic STAR transitions are to high-wage destination jobs as transitions made by white STARs.

These three observations — about starting wage, skill distance, and transition to high wage jobs - are aggravated by one more trend: Black and Hispanic STARs make more transitions than their white counterparts. While they make up 19.5% of the workforce, they make 22.8% of the transitions. In other words, they experience more churn for less wage gain. Given that each job transition carries a risk of wage loss, Black and Hispanic STARs are navigating a narrow path to wage gain.

TABLE 3.1: UPWARDLY MOBILE TRANSITIONS BY RACE

	Hispanic STARs	Black STARs	White STARs
Percent starting an upward job transition in a low-origin wage job	54%	58%	47%
Average skill distance of upward transition made	2.87	2.76	2.95
Percent ending a transition in a high-wage destination job	3.0%	2.8%	5.9%

Note: The Current Population Survey measures race (White, Black, American Indian, Asian/Pacific Islander, and Other) and ethnicity (Hispanic and non-Hispanic) separately. For simplicity in our text, we refer to non-Hispanic white STARs as white STARs, non-Hispanic Black STARs as Black STARs, and Hispanic STARs as Hispanic STARs.

Non-Hispanic Asians, Non-Hispanic American Indians, and all other racial and ethnic groups make up 7.9% of the active labor force and 6.0% of the STAR population. Future research should explore promising pathways for these workers as well.

RELATED LITERATURE:

Historic patterns of discrimination and their impact on Black labor market outcomes

Narratives around economic mobility often focus on individual predictors and outcomes. However, structural and historic factors greatly influence group and individual prospects for mobility in the labor market. There is a rich and growing literature on these factors. The following is only a partial summary.

Housing discrimination, for example, created and sustained neighborhood segregation, which limits equal access to transportation (Gabriel & Rosenthal, 1996), education (Leventhal & Brooks-Gunn, 2004), healthcare (White, Haas, & Williams, 2012), and jobs (Williams, 2019). Further, regions with greater proportions of Black residents are more likely to have adopted "place-based" policies, or policies targeted at specific locations, such as welfare programs and policing, that historically have had disproportionate negative impacts on Black Americans (Hardy, Logan, & Parman, 2018).

Our analysis of upward transitions for women STARs shows that they make transitions of lower skills distance than men.

Women STARs make transitions for less wage gain than men STARs. Our analysis of upward transitions for women, summarized in Table 3.2, shows similar patterns to those described for Black and Hispanic STARs. A higher proportion of women than men begin their transition at a low-wage origin job (58% vs 44%). When women make upward transitions, they travel a lower skill distance than men (2.78 vs. 3.02). And, they make fewer transitions to higher wages - about half as many women as men STARs transition to high-wage destination jobs (3.6% vs 6%).

When women do make transitions of significant skill distance, they are not as well compensated for the leap. Take for example, a transition of relatively high skill distance: When men STARs made a transition with a skills distance of 4.5, they moved from a median wage of $17.00/hr to $26.40/hr ($9.40/hr change). Women STARs who made a similarly large transition moved from median wages of $13.00/hr to $19.60/hr ($6.60/hr change) - ending very close to where the men started. It is also worth noting that they have a harder time making this transition - whereas our data showed that 14% of men STARs made this transition, only 9% of women STARs did. Women simply have less access to upwardly mobile pathways than men do.

TABLE 3.2: UPWARDLY MOBILE TRANSITIONS BY GENDER

	Women STARs	Men STARs
Percent starting an upward job transition in a low-wage origin job	58%	44%
Average skill distance of upward transition made	2.78	3.02
Percent ending a transition in a high-wage destination job	3.6%	6.0%

Race and gender disparities undermine promising pathways for STARs. As STARs leverage their skills to achieve upward mobility, we see disparities. Even on promising pathways, we see a drop in the number of STARs, Black and Hispanic workers, and women workers making upward transitions as wages increase. Figure 3.1 illustrates the divergent outcomes for workers across education, race and gender. Among STARs who made upward transitions from 2010 - 2019, 71% began in low-wage origin jobs. Of those upward transitions, 63% were to middle-wage jobs and only 9% to high-wage jobs. Nearly 30% of their upward transitions were to other low-wage jobs. Black, Hispanic, and Women STARs fared significantly worse: they started in the low-wage origin jobs in higher numbers and made fewer transitions to middle- or high-wage destination jobs. (All these numbers stand in stark contrast to the movement of workers with four-year degrees, who started in low-wage jobs only 41% of the time and landed in high-wage jobs 35% of the time.)

FIGURE 3.1 DEMOGRAPHICS ACROSS A JOB PATHWAY

Black, Hispanic, and Women STARs face steep declines across Promising Pathways

Demographics of workers by role:

Low Wage Origin Job	Middle Wage Destination Job	High Wage Destination Job
41% Workers w/4-year degree	55% Workers w/4-year degree	35% Workers w/4-year degree
71% STARs	63% STARs	9% STARs
78% Black and Hispanic STARs	59% Black and Hispanic STARs	6% Black and Hispanic STARs
78% Women STARs	56% Women STARs	7% Women STARs

This figure shows a steady decline in the number of STARs as they traverse all promising pathways from low-wage origin jobs to middle wage destination jobs (including Gateway jobs) to high-wage destination jobs. It compares, across types of workers, the number of workers who started their upward transition in a low wage occupation and the percent of transitions that ended in a middle- or high- wage destination job. While 35% workers with a four year degree navigate the pathway to reach a high wage destination, only 9% of STARs do. The declines are even more dramatic for Black, Hispanic, and Women STARs.

RELATED LITERATURE:

Gender Discrimination in the Labor Market

Regardless of how many women work in a given profession, women tend to earn less than men. Across 119 occupations in 2015, there was only one for which women earned the same amount as men (Institute for Women's Policy Research, 2015). Occupational segregation explains some of these differences: lower-paying jobs (like food server and housekeeper) are more likely to be held by women, whereas higher-paying jobs (like chief executive and computer engineer) are more likely to be held by men. However, simply working to increase the proportion of women in a field is unlikely to resolve the gender gap. Based on census data from 1950–2000, when fields shift from predominantly male to predominantly female, wages tend to decline (Miller, 2016). While the low-wage workforce may be disproportionately made up of women, gaps persist even among men and women working in the same professions, suggesting that women's work is often undervalued.

The gap between men and women is well-documented and often discussed, but comparisons between people of different genders, races, and levels of education show even more troubling trends. For example, among people without bachelor's degrees, Black and Latina women earn less than white women, and all three of these groups earn significantly less than white men. In low-wage jobs, Latina women with four-year college degrees earn about 39% less than White men with the same degrees (Clemens, A., Vaghul, K., Schmitt, J., & McGrew, W., 2019). This means that even at the same education level, women of color earn significantly less than their white male counterparts. (Further comparisons of wages among workers from different groups can be explored using the Center for Equitable Growth's interactive tool.) Higher education, as well as training programs that help women enter more male-dominated fields, are clearly not sufficient to resolve the gender wage gap. These trends highlight the persistence of this gap and the necessity of adopting more comprehensive, structural policies to resolve it.

Across 119 occupations in 2015, there was only one for which women earned the same wages as men.

STAR STORY: THADDAEUS

Using Tech Skills to Navigate a Pathway in IT

Role: Tech Support

One of the things Thaddaeus loves about his job is that he gets to help others. He is responsible for technical support in his academic department, on everything from projects to meetings to events. He guides faculty, staff, and students through difficult technical challenges and does projects of his own. His skills have been critical in the recent transition to online learning.

When Thaddaeus started at the university, he had no formal training in IT or tech support. He had developed all his skills by leveraging his affinity for computers, over a series of jobs — including office admin, medical transcriptionist, and freelance designer. He taught himself video editing, audio editing, and even to work with several operating systems. He also developed strong problem solving skills. "Doing a lot of tech support, you encounter people at a really particular moment. They have been working on something and then something interrupted their flow. So they're frustrated, they're confused, they have a problem that they can't solve, and they just want it fixed."

Thaddaeus is a professional performer outside his day job. He has roles in local theatrical productions and works as a standardized patient actor to teach medical students effective and empathetic patient interaction and communication. These theatrical projects provide an artistic outlet and make him an excellent communicator and public speaker. He is comfortable in front of an audience, skilled at explaining complex information, and good at giving and receiving feedback.

When Thaddaeus was first starting out, his dream was to design theme parks. While that is not where his career took him, he has found his own pathway to jobs that allow him to use his creativity, problem solving and interpersonal skills to create a positive learning environment at the university.

"A through line to everything has been, just working within tech, working in IT. I have always sort of gravitated towards computer work and computer repair and stuff like that."

Implications

Our research underscores inequities in the labor market that harm workers, but it also shows a way forward. With intention, we can broaden pathways and facilitate STARs' access to higher paying jobs. Specifically, we can eliminate barriers to existing jobs and we can structure new-to-world jobs to be more accessible to STARs.

We can make promising pathways more accessible to STARs. We have identified 292 pathways, many through 51 Gateway jobs, that provide mobility to STARs. And yet, even on these promising pathways we see the number of STARs, Black and Hispanic workers, and women drop over the series of transitions. To facilitate movement by STARs, we must address the barriers that obstruct these transitions.

One obvious barrier is the college degree requirement. We find many jobs where a degree is often, but not always required.[9] For example, the number of Registered Nurses with four-year college degrees versus associates degrees varies by state.[10] Such jobs serve as proof that a four-year college degree is not the sole signal of readiness for a job. If employers looked for new jobs among skills-similar origin jobs, they could widen their sourcing pools for talent and consider more pathways for advancement, which would provide opportunities for high numbers of STARs.

Similarly, we can make these pathways more accessible through targeted interventions such as on-the-job training, community college programs, certifications, and other alternative routes that allow workers to develop and signal specific skills they need to transition from one job to another. In Finding 2, we demonstrated that close to 10 million jobs will open up in the coming year alone that could be filled by STARs if employers sourced more intentionally from the STARs talent pool.

Eliminating degree requirements and creating interventions are just two ways to facilitate advancement on these pathways. We know that there are other factors limiting STARs ability to make these transitions, including lack of knowledge about the opportunities, thinner social networks, insufficient access to transportation and childcare, bias in hiring, and more. As Executive Osman Parvaiz at Capital One shared, "the data will show pathways, but there are meaningful blind spots that the data doesn't show due to biases that prevent many workers from realizing their potential." In other words, we cannot see the pathways not taken. We need to assess all entry points to the pathway to fully account for the barriers.

"The data will show pathways, but there are meaningful blind spots that the data doesn't show due to biases that prevent many workers from realizing their potential."

- Osman Parvaiz, Capital One

New-to-world jobs can open emerging pathways to STARs. Our economy continues to add new occupations and as these jobs take shape, we have choices to make about the requirements for new hires. Consider the Information Security Analyst, a job that didn't exist 20 years ago, and is increasingly in demand. Employers identify the most critical skills for this role as being able to solve problems and having a learning mindset, skills that are best learned through exposure to real world challenges on the job. It is an ideal role for STARs who have built such skill sets through experience.

We see similar potential for other emerging pathways across occupations and industries. See our related work on emerging pathways in the Spotlight below for an illustration of pathways to two more new-to-world roles: Patient Care Coordinator and Data Analyst. STARs have navigated pathways to these roles starting in common entry-level origin roles, building skills through Gateway jobs, and positioning themselves to fill these jobs. They are still severely underrepresented in these roles but we have the opportunity to broaden pathways to these roles and to define job requirements for future jobs in ways that open new pathways for STARs. Through deliberate action, we can make sure that future data does not reflect continued inequitable distribution of jobs and wages but that STARs, of all races and genders, have opportunities based on their skills for upward mobility.

Leading Employers Reconsider Job Requirements

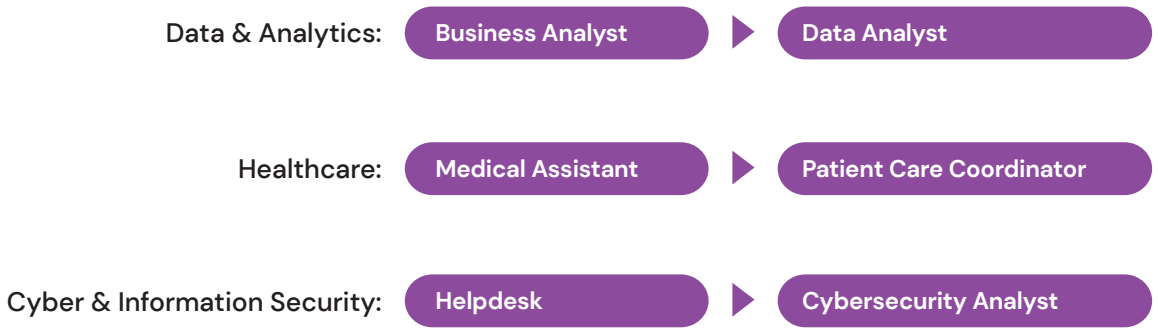
"A diverse and inclusive culture, which includes diversity of thought and experiences, is important when building a team. Information security professionals come from all walks of life and backgrounds. The traits required to succeed in these roles include customer service skills, collaboration skills, incident response management knowledge, curiosity and the ability to learn and master the essential technical tools of the job."

—Sydney Klein, Chief Information Security Officer of Bristol Myers Squibb

"In information security, attackers continue to move the goalposts; continuous learning is key. I have seen people with psychology and philosophy degrees be successful in these roles; people can also come from physical security operations center backgrounds."

—Aaron Hughes, Cybersecurity Tech Executive

EMERGING PATHWAYS



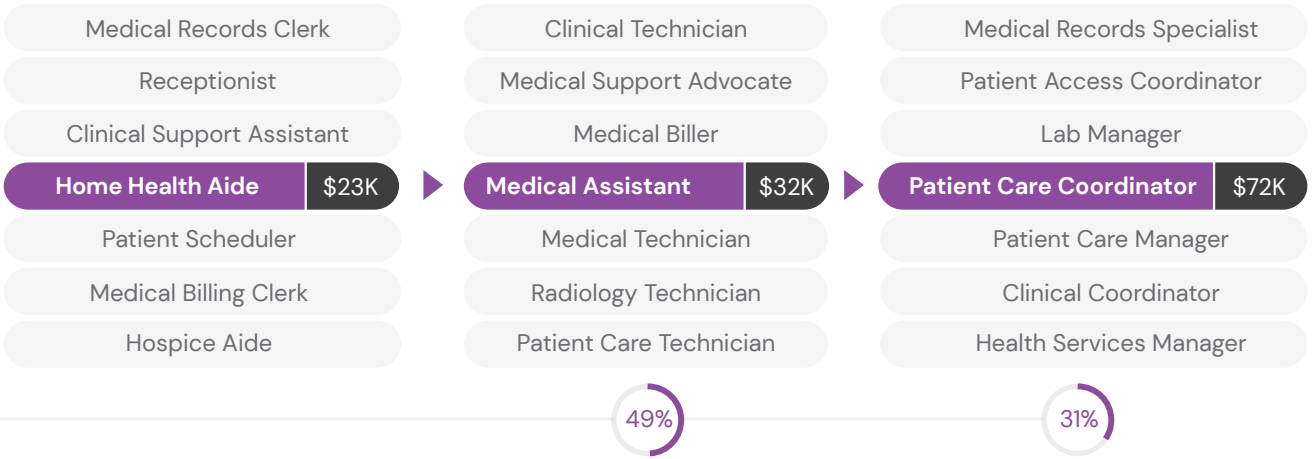
SPOTLIGHT

To understand these emerging pathways, we worked with McKinsey & Company's Organization Practice on a Pathways Project research effort to help employers move beyond the four-year degree requirement and increase the pool of talent that employers consider for jobs. This collaboration supplements our findings in this report with deep dive resume data from EMSI and other proprietary sources.

Using this data, we studied the pathways workers took to achieve a number of positions in the fields of technology, healthcare and business management. Here, we focus on two specific roles: the Data Analyst and the Patient Care Coordinator jobs. These are roles that are relatively new to the labor market — and growing. Our review of skills, resume and job postings data from current workers in this position to get a clear picture of potential pathways to these roles. Both show promise for STARs.

Job postings for Patient Care Coordinator revealed that a large majority (69%) require a bachelor's degree but that there is variation across states, confirming that the degree is not critical to the job. Further, a study of over 8,000 resumes of STARs in this role identified Registered Nurses and First-Line Supervisors of Office and Administrative Support Workers as the highest source origin job

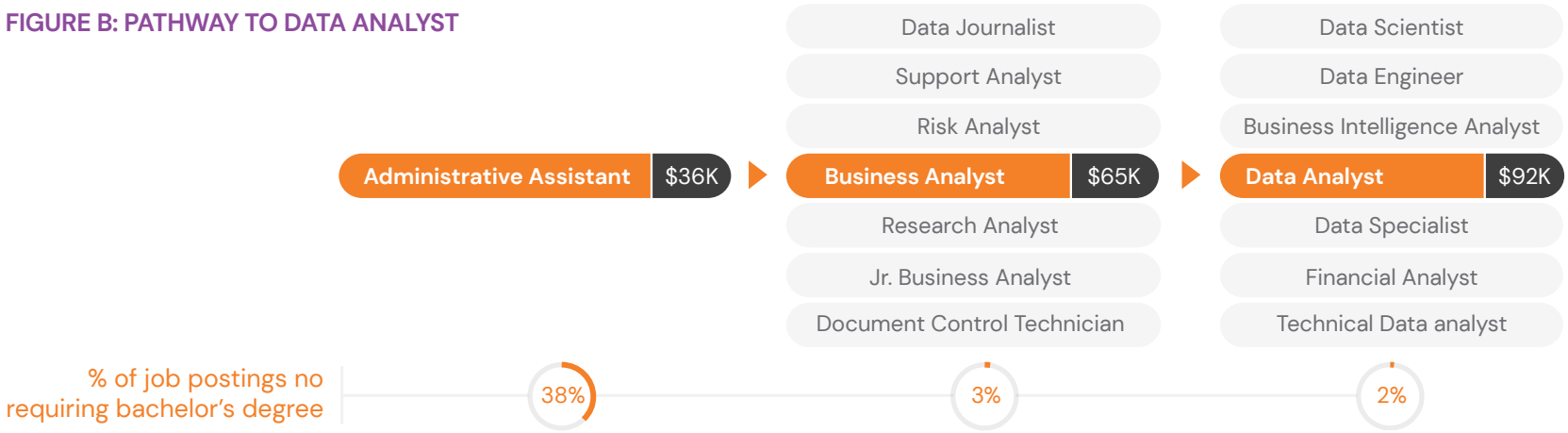
FIGURE A: PATHWAY TO PATIENT CARE COORDINATOR



for workers who transition into this role. These origin occupations have high volumes of STARs and have greater racial diversity of workers than the current makeup of workers in the Patient Care Coordinator role, suggesting they can be an excellent source of STAR talent for the role. It is worth noting that these are not the only entry points for STARs — our resume analysis revealed over 3,000 unique pathways that STARs took to become Patient Care Coordinators.

The Data Analyst role tells a similar story. Job postings show that 97% of job postings include a bachelor's degree requirement and yet we identified over 2,000 STARs who took more than 1,000 different paths to get to this role. Potential origin occupations with large numbers of workers available to move into this role include Computer Support Specialists and the Operations Research Analysts roles. Our skills analysis suggests that there are other potential origin occupations these workers could be found in, including Mathematical Science Occupations, Market Researchers, and Statistical Assistants. All of these occupations employ larger numbers of STARs than the Data Analyst role, and they offer a large, diverse pool of talent.

FIGURE B: PATHWAY TO DATA ANALYST



STAR STORY: KATY

Creating a Pathway

Role: Data Analytics

Katy started her career as a musician out of high school. Tired of life on the road, she leveraged her high school vocational training and an associate degree in media arts to become adept at sound design and electronics repair. She worked in record studios and music stores, running and repairing equipment. “All the pro audio equipment, all the PA equipment, all the recording equipment, DJ stuff, the keyboards, I kept everything connected and running.”

Looking for a more professional opportunity, Katy began to explore other options, but it was hard to find a job in a new field. An active athlete in a rugby league, she turned to her team where the senior members took her under their collective wing. They coached her through resume building and interview preparation, and helped open doors that she otherwise would not have known about. One of her teammates helped her get an interview in a medical technology firm and she got the job.

Her technical skills helped her adapt to this new environment, even as she faced the steep learning curve that comes in a new industry. Katy learned soft skills. “Working with groups and teams, talking to people, leading people, communicating with people in general was new to me.” Over time, she has been able to take on more responsibilities including project management. At her employer’s suggestion, she completed an online degree program with a number of IT certifications. Now, a Data Analyst, Katy continues to pay it forward, helping younger rugby players pursue their professional dreams. “I love being able to help people out now and I wouldn’t be able to do it if not for the fact that someone had done it for me.”

“I wanted to have some sort of more technical, substantial role.”

Call to Action

In our current labor market, workers make many job transitions and build increasingly broad skill sets, only to experience stagnant, or even worse, downward wage trajectories. These trends undermine our American Dream, which rests on the belief that workers will experience upward mobility as they work hard and develop skills. Further, employers lose out on workers' expertise and skills as they use ineffective methods to select and develop talent. It is a tragic market failure that our evolving economy relies on workers to be lifelong learners yet fails to reward that learning.

Employers have a critical role to play in building and widening promising pathways for STARs. Because no single employer employs workers in all the roles along a pathway, this effort is a collective responsibility for employers, workforce providers, and educators.

Leverage your jobs to open pathways.

If you are an employer, you can take action based on the jobs and skills deployed in your business.

- **If you are an employer with STARs in lower-wage origin jobs, define a skills-based pathway to higher-wage work for them.** Understand where your workers could go next in the local labor market. Consider the skills they demonstrate on the job and how those skills can be deployed to other higher-wage jobs In your region.
- **If you are an employer with many middle-wage roles, open those roles to STARs.** Understand the origin jobs in your local market where workers are developing and demonstrating the skills you most need in your roles. Remove barriers such as the four-year college degree, look for STARs in origin jobs, and define a pathway for them into your jobs.
- **If you are an employer with a new-to-world role, design this role to facilitate entry for STARs.** Assess the skills needed for this new-to-world role and compare it to origin roles with high numbers of workers. Identify the jobs that can serve as feeders for your new-to-world role, based on skills distance, and build a pathway based on those skills.

Contribute to the infrastructure for promising pathways.

To support STARs movement on pathways from origin to Gateway to destination jobs, you will need to partner with others in your workforce ecosystem.

- **Partner with other employers.** STARs journeys will require moves across companies and industries. Create relationships among employers to facilitate those transitions.
- **Invest in training partners.** Support community colleges, bootcamps, non-profit training and support organizations, and other organizations that support STARs in their skilling efforts. Contribute your expertise as well by providing feedback on curriculum and placement.
- **Collaborate with workforce entities.** Communication and coordination with workforce organizations — employment agencies, local nonprofits — and others is critical to ensure that STARs have the information about which jobs to pursue and what resources are available to them.
- **Support the social safety net.** Support organizations that provide access to wraparound services, such as childcare and transportation, to minimize barriers to STARs' mobility.

Update your employee value proposition.

A core talent acquisition and retention strategy is one that ensures mobility for your workers. Conduct your own skills distance analysis across jobs in your company and your community. Audit the educational attainment, race, and gender makeup of your workforce. Set targets for STAR mobility. Create the pathways to higher paying jobs. And communicate that proposition effectively with a plan to ensure your workers know that they have a path to higher wages by coming to work for you.

Acknowledgements

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We are grateful to the Opportunity@Work STARs Insights Advisory Panel, chaired by Dr. Erica Groshen, the Former Commissioner of the Bureau of Labor Statistics and Faculty at Cornell University. Dr. Groshen's insightful guidance shaped this research question, and added clarity to our perspective. Our work is stronger — methodologically and theoretically — because of the deep engagement and research partnership from Dr. Peter Q. Blair, Assistant Professor, Harvard University and NBER Faculty Research Fellow. We are deeply grateful for his partnership to co-author "Searching for STARs" earlier this year in the NBER Working Paper Series, and his continued intellect, graciousness, and friendship in this work. The other members of our panel provided subject matter expertise and constructive input for our analyses and interpretation of results, including Dr. Chandra Childers, Study Director, Institute for Women's Policy Research; Dr. Martin Fleming, former Chief Economist, IBM Corporation; Martha Gimbel, Manager, Economic Research, Schmidt Futures; Dr. Michael R. Strain, Director of Economic Policy Studies and John G. Searle Scholar, American Enterprise Institute; and Keith Wardrip, Community Development Research Manager, Federal Reserve Bank of Philadelphia.

Our partners over the years contributed to our understanding of these complex pathways. We are thankful for the collaboration with Carolyn Pierce of McKinsey & Company's Organization Practice for their support of the Pathways Project work. Feedback from Gayatri Agnew at Walmart.org and Kristen Titus at Cognizant U.S. Foundation provided valuable perspective on the power to reimagine pathways. Conversations with Ardine Williams at Amazon shaped the initial set of questions to spark this research.

We at Opportunity@Work are thankful for the generous support from the Chan-Zuckerberg Initiative, Cognizant U.S. Foundation, Google.org, Lumina Foundation, Walmart.org and the Workday Foundation. We are also grateful to our board members Anne-Marie Slaughter and Reid Hoffman for their support of this work since its inception, and their engagement with our findings. And we are thankful to a team of researchers who help us understand the real-world implications of this work: Adrienne Jones, Stephanie Tepper, Liann Yamashita, and Pamela Zabala.

Finally, and most importantly, we are indebted to the many STARs who inspire our work and mission daily. We especially want to thank Barbara Leach, Thaddeus Edwards, Katy Broerman and Erika Walden for sharing their personal stories for this report.

While this report is the product of many, we take full responsibility for the research and content, and any errors held within.

With Thanks,

Papia Debroy, Shad Ahmed, Amy Mortimer, and Justin Heck, on behalf of Opportunity@Work

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Appendix

Data Sources and Methodology.[11]

Datasets.

Our analysis is based on two publicly available federal government databases — the U.S. Department of Labor's Occupational Information Network (O*NET) and the Bureau of Labor Statistic's Current Population Survey (CPS).

We use the O*NET database to estimate a given worker's skill portfolio based on their current occupation and to compute our measure of skill similarity between any two occupations. The O*NET database is one of the most comprehensive public data sources for occupational information, providing information about 969 individual occupations categorized by a standard occupation code (SOC). The O*NET database is maintained and updated regularly through its Data Collection Program, which conducts a survey of workers, assessing topics such as required education, abilities, experience, tasks, and skills.

In this paper we focus on the O*NET ratings of the importance of the occupational skill requirements, taking them as a proxy for the skills possessed by each worker. The O*NET Content Model considers them "work-related attributes acquired and/or developed through experience and education," which is precisely what we want to measure, whereas abilities, for example, relate to "enduring attributes of the individual that influence the work performance." While most of the information is collected from those surveys, occupational analysts for the O*NET provide ratings for a set of 35 skills within seven broad categories: content, process, social, complex problem solving, technical, systems, and resource management. Each skill is rated on a scale from 1 to 5 based on how important that skill is in order to perform the tasks associated with a given occupation.

We use the Current Population Survey (CPS) to sample the worker population. Conducted by the U.S. Census Bureau for the Bureau of Labor Statistics (BLS), the CPS is a monthly household survey providing one of the most important sources for economic and social statistics about the labor force. Each year, the Annual Social and Economic Supplement (ASEC) of the CPS provides a more in-depth snapshot of individuals' employment, earnings, and health insurance. The ASEC is particularly useful for this analysis because workers are asked about both their current occupation and their occupation in the previous year, allowing us to identify cross-occupational transitions.

We access CPS data using the IPUMS-CPS dataset which integrates CPS data from 1962 to the present using harmonized variables which make cross-time comparisons more feasible. Because the Census has made multiple updates to their occupation codes during this time frame, IPUMS-CPS provides a harmonized 2010 occupation coding, which condenses the larger set of occupational codes used over time to a comparable set of 441 occupations.

For each worker in the CPS, we match the O*NET occupational skill requirements for that same occupation to the worker. Note that the match between CPS OCC Code and O*NET SOC code uses the official crosswalk provided by IPUMS-CPS. O*NET provides skills for occupations at an 8-digit depth, while the CPS OCC Codes are equivalent in depth to 6-digit SOC Codes, so we first take the 6-digit skill averages from the O*NET Skill database. We then match those averages with the CPS Codes.

Because of the portion of younger workers attending college and making sizeable transitions from part-time work to full-time work post graduation, we adopt the norm in the literature and focus on members of the active labor force who are 25 years or older. We excluded unemployed workers and those in the CPS for whom income or occupational data is not available primarily because we use a workers' current occupation to estimate her skill portfolio and the distance to alternative occupations. Finally, we restrict our analysis to workers with at least a high school diploma or its equivalent.[12]

Throughout our work, we consider the data in ten-year windows (e.g. 2010-2019, 2009-2018) in order to observe a reasonably large sample of cross-occupational transitions. During this time period, we observe 21,472 unique origin-destination transitions. While we ultimately extend our analysis back to 1976,[13] our analysis primarily emphasizes the results from 2010 to 2019.

Data Analysis.

We posit that the skills associated with a worker's current occupation provide an implicit job market signal that can and should be considered explicitly.[14] In Blair et al., 2020, we demonstrate that workers are much more likely to transition from their current occupation to one requiring a similar skill set than to one with a disparate skill set and present evidence that STARs and workers with 4-year college degrees experience upwardly mobile transitions differently.

Central to our argument is the idea that a worker's current skill set impacts her or his ability to transition to other occupations. If we conceive of an occupation as a bundle of tasks, the skills rated by the O*NET represent the bundle of job-related competencies necessary for a worker to successfully perform those tasks. For example, for a customer service representative, the skills of active listening and speaking are rated as highly important while the skills of repairing and equipment maintenance are rated as unimportant. While there is certainly variation in the skill sets of workers within an occupation, especially for recently hired workers, through training and on-the-job experience, we assume that workers develop the full set of skills required to perform their current occupation. As a result, the 35-item vector of O*NET skill importance ratings for a worker's current occupation provides a good estimate of their current skill portfolio, and the potential transitions available to them.

Our next task is to directly test the question of whether a worker's skill portfolio is more likely to lead them to other occupations requiring a similar set. In order to develop an intuitive understanding of the similarity of two jobs and to reduce the dimensionality of the skill item vectors, we adopt a distance-based measure of occupational similarity such that occupations that are near to one another share a more common set of skills. For each pair of occupations , we calculate the Euclidean distance between the two occupations' skill vectors such that:

$$d(\text{Occupation}_i, \text{Occupation}_j) = \sqrt{\sum_{k=1}^{35} (\text{Skill}_{k,\ \text{Occ.}_i} - \text{Skill}_{k,\ \text{Occ.}_j})^2}$$

We then identify which STARs made which transitions in this time period, as well as the Euclidean distance (which we refer to as skills distance) of each transition.

TABLE A1. HIGHEST VOLUME TRANSITIONS TO DESTINATION JOBS MADE BY STARS (2010–2019)

Destination	Type	Destination Wage	Number of Transitions	Median Wage Gain	Highest Volume Origin Jobs
Driver/Sales Workers And Truck Drivers	low to mid	$19.23	1,087,322	$3.6	• Laborers And Freight, Stock, And Material Movers, Hand • Taxi Drivers And Chauffeurs • Bus And Ambulance Drivers And Attendants
Customer Service Representatives	low to mid	$19.23	516,705	$4.04	• Receptionists And Information Clerks • Retail Salespersons • Billing And Posting Clerks
Secretaries And Administrative Assistants	low to mid	$19.23	416,389	$4.81	• Stock Clerks And Order Fillers • Data Entry Keyers • Receptionists And Information Clerks
Managers, Nec (Including Postmasters)	low to mid	$34.21	344,044	$16.83	• Food Service And Lodging Managers • First-Line Supervisors Of Food Preparation And Serving Workers • Janitors And Building Cleaners
Inspectors, Testers, Sorters, Samplers, And Weighers	low to mid	$21.15	338,991	$5.29	• Assemblers And Fabricators, Nec • Sewing Machine Operators • Other Production Workers Including Semiconductor Processors And Cooling And Freezing Equipment Operators
First-Line Supervisors Of Sales Workers	low to mid	$21.63	319,302	$6.51	• Cashiers • Retail Salespersons • Laborers And Freight, Stock, And Material Movers, Hand
Sales Representatives, Wholesale And Manufacturing	low to mid	$31.25	319,114	$13.77	• Retail Salespersons • Cashiers • Telemarketers
Real Estate Brokers And Sales Agents	low to mid	$25	319,050	$8.13	• Retail Salespersons • Cashiers • Door-To-Door Sales Workers, News And Street Vendors, And Related Workers
Office Clerks, General	low to mid	$18.27	278,976	$3.85	• Stock Clerks And Order Fillers • Shipping, Receiving, And Traffic Clerks • Cashiers
Bookkeeping, Accounting, And Auditing Clerks	low to mid	$19.42	240,887	$4.04	• Receptionists And Information Clerks • Billing And Posting Clerks • Bank Tellers
Insurance Sales Agents	low to mid	$24.04	239,297	$8.92	• Retail Salespersons • Cashiers • Door-To-Door Sales Workers, News And Street Vendors, And Related Workers
Licensed Practical And Licensed Vocational Nurses	low to mid	$19.78	222,352	$2.04	• Health Diagnosing And Treating Practitioner Support Technicians • Nursing, Psychiatric, And Home Health Aides • Cashiers

Destination	Type	Destination Wage	Number of Transitions	Median Wage Gain	Highest Volume Origin Jobs
Computer Scientists And Systems Analysts/ Network Systems Analysts/Web Developers	mid to high	$37.18	214,729	$7.39	• Computer Support Specialists • Network And Computer Systems Administrators • Computer, Automated Teller, And Office Machine Repairers
Welding, Soldering, And Brazing Workers	low to mid	$19.23	206,295	$3.36	• Assemblers And Fabricators, Nec • Butchers And Other Meat, Poultry, And Fish Processing Workers • Carpenters
Pipelayers, Plumbers, Pipefitters, And Steamfitters	low to mid	$24.04	200,516	$7.77	• Painters, Construction And Maintenance • Construction Laborers • Laborers And Freight, Stock, And Material Movers, Hand
Chief Executives And Legislators/Public Administration	mid to high	$57.69	188,398	$28.7	• General And Operations Managers • Bookkeeping, Accounting, And Auditing Clerks • Driver/Sales Workers And Truck Drivers
Construction Equipment Operators Except Paving, Surfacing, And Tamping Equipment Operators	low to mid	$21.69	184,725	$4.62	• Construction Laborers • Drywall Installers, Ceiling Tile Installers, And Tapers • Carpet, Floor, And Tile Installers And Finishers
Management Analysts	mid to high	$38.86	184,391	$10.54	• Human Resources, Training, And Labor Relations Specialists • Purchasing Agents, Except Wholesale, Retail, And Farm Products • Compliance Officers, Except Agriculture
Sales Representatives, Services, All Other	low to mid	$28.96	161,409	$12.31	• Retail Salespersons • Cashiers • Door-To-Door Sales Workers, News And Street Vendors, And Related Workers
Property, Real Estate, And Community Association Managers	low to mid	$24.68	150,716	$7.24	• Food Service And Lodging Managers • Retail Salespersons • Waiters And Waitresses
Electrical Power-Line Installers And Repairers	mid to high	$36.18	150,296	$13.25	• Automotive Service Technicians And Mechanics • Industrial And Refractory Machinery Mechanics • Heavy Vehicle And Mobile Equipment Service Technicians And Mechanics
Metal Workers And Plastic Workers, Nec	low to mid	$18.46	146,504	$3.71	• Assemblers And Fabricators, Nec • Laundry And Dry-Cleaning Workers • Packaging And Filling Machine Operators And Tenders
Sales And Related Workers, All Other	low to mid	$20.81	144,280	$3.33	• Retail Salespersons • Cashiers • Other Production Workers Including Semiconductor Processors And Cooling And Freezing Equipment Operators
Managers In Marketing, Advertising, And Public Relations	mid to high	$37.02	140,242	$9.45	• Administrative Services Managers • First-Line Supervisors Of Sales Workers • General And Operations Managers

Destination	Type	Destination Wage	Number of Transitions	Median Wage Gain	Highest Volume Origin Jobs
Machinists	low to mid	$24.04	131,033	$8.88	• Assemblers And Fabricators, Nec • Sewing Machine Operators • Butchers And Other Meat, Poultry, And Fish Processing Workers
Office And Administrative Support Workers, Nec	low to mid	$21.63	125,954	$6.27	• Stock Clerks And Order Fillers • Shipping, Receiving, And Traffic Clerks • Hotel, Motel, And Resort Desk Clerks
Elementary And Middle School Teachers	low to mid	$23.46	113,008	$8.28	• Preschool And Kindergarten Teachers • Nursing, Psychiatric, And Home Health Aides • Hairdressers, Hairstylists, And Cosmetologists
Lawyers, And Judges, Magistrates, And Other Judicial Workers	mid to high	$57.69	111,440	$33.87	• Driver/Sales Workers And Truck Drivers • Registered Nurses • First-Line Supervisors Of Sales Workers
Advertising Sales Agents	low to mid	$26.28	110,409	$14.27	• Cashiers • Retail Salespersons • Dishwashers
Other Teachers And Instructors	low to mid	$21.63	106,482	$6.46	• Preschool And Kindergarten Teachers • Janitors And Building Cleaners • Waiters And Waitresses
Pest Control Workers	low to mid	$19.21	106,053	$4.94	• Janitors And Building Cleaners • Grounds Maintenance Workers • Parking Lot Attendants
Dispatchers	low to mid	$21.06	104,343	$5.05	• Receptionists And Information Clerks • Billing And Posting Clerks • Bank Tellers
Registered Nurses	low to mid	$33.65	103,748	$19.45	• Nursing, Psychiatric, And Home Health Aides • Cashiers • Waiters and Waitresses
File Clerks	low to mid	$19.05	103,681	$3.67	• Receptionists And Information Clerks • Billing And Posting Clerks • Bank Tellers
Bookbinders, Printing Machine Operators, And Job Printers	low to mid	$24.04	99,997	$8.17	• Assemblers And Fabricators, Nec • Butchers And Other Meat, Poultry, And Fish Processing Workers • Sewing Machine Operators
First-Line Supervisors Of Office And Administrative Support Workers	low to mid	$22.6	95,112	$7.72	• Stock Clerks And Order Fillers • Janitors And Building Cleaners • Retail Salespersons

Destination	Type	Destination Wage	Number of Transitions	Median Wage Gain	Highest Volume Origin Jobs
Automotive Service Technicians And Mechanics	low to mid	$19.23	93,143	$3.36	• Grounds Maintenance Workers • Vehicle And Mobile Equipment Mechanics, Installers, And Repairers, Nec • Agricultural Workers, Nec
Baggage Porters, Bellhops, And Concierges	low to mid	$20.88	90,763	$7.23	• Personal Care Aides • Entertainment Attendants And Related Workers, Nec • Hairdressers, Hairstylists, And Cosmetologists
Personal Financial Advisors	mid to high	$46.15	87,655	$16.45	• Credit Counselors And Loan Officers • Tax Preparers • Financial Specialists, Nec
Production, Planning, And Expediting Clerks	low to mid	$23.13	87,588	$7.9	• Stock Clerks And Order Fillers • Shipping, Receiving, And Traffic Clerks • Receptionists And Information Clerks
Software Developers, Applications And Systems Software	mid to high	$48.08	87,018	$18.43	• Computer Support Specialists • Network And Computer Systems Administrators • Customer Service Representatives
Electricians	low to mid	$28.37	83,988	$12.5	• Construction Laborers • Retail Salespersons • Electronic Equipment Installers And Repairers, Motor Vehicles
Couriers And Messengers	low to mid	$19.23	81,108	$3.85	• Receptionists And Information Clerks • Laborers And Freight, Stock, And Material Movers, Hand • Bank Tellers
Purchasing Managers	mid to high	$36.06	76,024	$7.2	• Farmers, Ranchers, And Other Agricultural Managers • Constructions Managers • Transportation, Storage, And Distribution Managers
Securities, Commodities, And Financial Services Sales Agents	low to mid	$34.46	75,121	$17.16	• Retail Salespersons • Cashiers • Nursing, Psychiatric, And Home Health Aides
Financial Managers	mid to high	$36.06	73,151	$7.06	• Administrative Services Managers • General And Operations Managers • Credit Counselors And Loan Officers
Maintenance And Repair Workers, General	low to mid	$21.51	71,428	$5.64	• Vehicle And Mobile Equipment Mechanics, Installers, And Repairers, Nec • Automotive Body And Related Repairers • Laborers And Freight, Stock, And Material Movers, Hand
Constructions Managers	low to mid	$31.39	70,978	$14.94	• Carpenters • Construction Laborers • Chefs And Cooks

TABLE A2: GATEWAY JOBS

Title	Job Family
Driver/Sales Workers And Truck Drivers	Transportation And Material Moving Occupations
Customer Service Representatives	Office And Administrative Support Occupations
Secretaries And Administrative Assistants	Office And Administrative Support Occupations
First-Line Supervisors Of Sales Workers	Sales And Related Occupations
Automotive Service Technicians And Mechanics	Installation, Maintenance, And Repair Occupations
Office Clerks, General	Office And Administrative Support Occupations
Bookkeeping, Accounting, And Auditing Clerks	Office And Administrative Support Occupations
Maintenance And Repair Workers, General	Installation, Maintenance, And Repair Occupations
Metal Workers And Plastic Workers, Nec	Production Occupations
Welding, Soldering, And Brazing Workers	Production Occupations
Inspectors, Testers, Sorters, Samplers, And Weighers	Production Occupations
First-Line Supervisors Of Office And Administrative Support Workers	Office And Administrative Support Occupations
Industrial And Refractory Machinery Mechanics	Installation, Maintenance, And Repair Occupations
Computer, Automated Teller, And Office Machine Repairers	Installation, Maintenance, And Repair Occupations
Designers	Arts, Design, Entertainment, Sports, And Media Occupations
Other Installation, Maintenance, And Repair Workers Including Wind Turbine Service Technicians, And Commercial Divers, And Signal And Track Switch Repairers	Installation, Maintenance, And Repair Occupations
Telecommunications Line Installers And Repairers	Installation, Maintenance, And Repair Occupations
Other Teachers And Instructors	Educational Instruction And Library Occupations
Highway Maintenance Workers	Construction And Extraction Occupations
Parts Salespersons	Sales And Related Occupations
Human Resources, Training, And Labor Relations Specialists	Business And Financial Operations Occupations
Licensed Practical And Licensed Vocational Nurses	Healthcare Practitioners And Technical Occupations
Social Workers	Community And Social Service Occupations
Sales And Related Workers, All Other	Sales And Related Occupations
Bus And Truck Mechanics And Diesel Engine Specialists	Installation, Maintenance, And Repair Occupations
Heating, Air Conditioning, And Refrigeration Mechanics And Installers	Installation, Maintenance, And Repair Occupations
Sales Representatives, Services, All Other	Sales And Related Occupations
Advertising Sales Agents	Sales And Related Occupations
Purchasing Agents, Except Wholesale, Retail, And Farm Products	Business And Financial Operations Occupations
Farmers, Ranchers, And Other Agricultural Managers	Management Occupations
Pipelayers, Plumbers, Pipefitters, And Steamfitters	Construction And Extraction Occupations
Couriers And Messengers	Office And Administrative Support Occupations
Construction Equipment Operators Except Paving, Surfacing, And Tamping Equipment Operators	Construction And Extraction Occupations
Painting Workers And Dyers	Production Occupations
Athletes, Coaches, Umpires, And Related Workers	Arts, Design, Entertainment, Sports, And Media Occupations
Cutting, Punching, And Press Machine Setters, Operators, And Tenders, Metal And Plastic	Production Occupations
Real Estate Brokers And Sales Agents	Sales And Related Occupations
Electricians	Construction And Extraction Occupations
Computer Support Specialists	Computer And Mathematical Occupations

Title	Job Family
First-Line Supervisors Of Construction Trades And Extraction Workers	Construction And Extraction Occupations
Managers, Nec (Including Postmasters)	Management Occupations
Computer Scientists And Systems Analysts/ Network Systems Analysts/Web Developers	Computer And Mathematical Occupations
Machinists	Production Occupations
Sales Representatives, Wholesale And Manufacturing	Sales And Related Occupations
File Clerks	Office And Administrative Support Occupations
Tax Preparers	Business And Financial Operations Occupations
Sheriffs, Bailiffs, Correctional Officers, And Jailers	Protective Service Occupations
Insurance Sales Agents	Sales And Related Occupations
Transportation, Storage, And Distribution Managers	Management Occupations
Elementary And Middle School Teachers	Educational Instruction And Library Occupations
Wholesale And Retail Buyers, Except Farm Products	Business And Financial Operations Occupations

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Endnotes

1. We calculate the Euclidean distance between the skill vectors of two occupations to understand the difference in skills required of a current occupation and a potential future one. See Blair et al. (2020) for more detail on our methodology.
2. Opportunity@Work analysis of Current Population Survey Annual Social and Economic Supplement 2010 - 2019. IPUMS-CPS, University of Minnesota, https://www.ipums.org. We include all workers with a high school diploma or equivalent who do not have a four-year college degree in our definition of STARs. Occupations were classified as essential by using the California State Public Health Officer's Essential Workforce List and O*NET survey data about the feasibility of performing a job from home.
3. Congressional Research Service, "Real Wage Trends 1979 to 2018," https://www.hsdl.org/?abstract&did=827842.
4. We use the O*NET occupational codes in our analysis, and use the term "occupation" — as described in the O*NET — and "job" interchangeably in the writing of this report. For more details on our analysis, please see the Appendix.
5. From 2010 to 2019, 10.8% of workers with a bachelor's degree or more transitioned to a different occupation each year. In comparison, 14.0% of STARs transitioned to a different occupation in a given year.
6. "Related Literature: STARs and Workers with Bachelor's Degrees Experience Different Transitions in the Labor Market"
7. For the purposes of our analysis, Gateway jobs have to meet specific criteria: (1) Wages: Gateway jobs pay above the national median wage. (2)Trajectory: Each gateway job is a destination occupation for at least five lower-wage occupations and is an origin job for at least five higher-wage occupations. In other words, STARs move into it from a lower paid occupation and move from it to a higher paid occupation. (3) Skill set: Each Gateway job has a close skill set, as measured by the median skills distance score, to the origin and destination jobs identified. (4) Reality check: We observed actual transitions by STARs from origin job to Gateway job, and then from Gateway job to destination job at least 2,000 times in the past 10 years.
8. Occupational Projections Data, Bureau of Labor Statistics, https://www.bls.gov/emp/data.htm
9. Wardrip et al. (2015).
10. Kyle Fee. "Opportunity Occupations: Exploring Employers' Educational Preferences for Registered Nurses Using Online Job Posting Data." Federal Reserve Bank of Cleveland. https://www.clevelandfed.org/newsroom-and-events/publications/a-look-behind-the-numbers/albtn-20171004-opportunity-occupations.aspx
11. We present this data and methods section in our corresponding work Blair, Debroy and Heck (2020).
12. This restriction removes about 8.8 million workers from our analysis. While future work should consider how this subset of workers achieve upwardly mobile transitions in the labor market, we chose to focus our attention on workers with at least a high school diploma because of the modern prevalence of the high school diploma as a minimum requirement on job openings across a wide variety of occupations.
13. This is the earliest that the CPS asked respondents about the total number of weeks worked per year which we use to calculate worker's hourly wages from their reported annual wages.
14. See Blair, Debroy and Heck (2020) for more on the evidence that skills convey occupational information effectively through the occupational fixed effects model.

Opportunity @Work

About Opportunity@Work

Opportunity@Work is a nonprofit social enterprise with a mission to increase career opportunities for the 71 million adults in the U.S. who do not have a four-year college degree but are Skilled Through Alternative Routes (STARs). For STARs, the American Dream has been fading due in part to an "opportunity gap," in which access to the good jobs required for upward mobility often depends less on people's skills and more on whether and where they went to college, who they know professionally and socially, or even how they look. We envision a future in which employers hire people based on skills rather than their pedigree. We are uniting companies, workforce development organizations and philanthropists in a movement to restore the American Dream so that every STAR can work, learn and earn to their full potential.

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