

## Code Switch: Rethinking Computer Expertise as Empowerment

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Claims that technical mastery of computing and new media will provide a route to economic success for oppressed groups have become ubiquitous in America. Commercial enterprises like Codecademy promise that learning to code will help “millions .... get the skills they need to succeed in today’s digital world,” while grassroots nonprofits like #YesWeCode assure young people of color, “The future is being written in code.”<sup>1</sup> A national movement to teach “computer science for all” was launched in 2009 when a coalition of educational, research, and industry groups led by ACM persuaded the US Congress to declare the second week of December “Computer Science Education Week.”<sup>2</sup> The event was timed to coincide with the December 9 birthday of Grace Murray Hopper, symbolically reinforcing the coalition’s stated goal of encouraging women and other underrepresented groups to take up computing. In what has become an annual ritual, politicians and celebrities join computer science advocates during CSEdWeek to promote coding as a route to economic opportunity, and in 2014 US President Barack Obama made headlines by participating in an introductory programming activity called the “Hour of Code.” The nonprofit Code.org, which runs the Hour of Code, has focused much of its effort on lobbying state legislators to increase computer science offerings in primary and secondary (K12) public schools. By 2015, fourteen states had passed laws requiring that computer science courses count toward graduation requirements, and in 2016 Obama announced a new federal initiative called “Computer Science For All.”<sup>3</sup> Collectively, these efforts have created a discourse of “coding as empowerment.”

This paper examines how various coding organizations have framed opportunity,

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<sup>1</sup> Codecademy Fact Sheet from press kit, <https://www.codecademy.com/about/>; Denver Nicks, “The Ambitious Plan to Teach 100,000 Poor Kids to Code,” *Time*, June 19, 2014.

<sup>2</sup> *Designation of National Computer Science Education Week*, 111th Congress (2009-2010), H. Res. 558; “About CS Ed Week,” <https://csedweek.org/about>.

<sup>3</sup> Jennifer Dounay Zinth, “Computer Science in High School Graduation Requirements” (Education Commission of the States, 2015); Barack Obama, “Giving Every Student an Opportunity to Learn through Computer Science for All,” <https://www.whitehouse.gov/the-press-office/2016/01/30/>.

asking *how* and *for whom* coding represents empowerment. Learning to code has been positioned as a quick fix for unequal opportunity, yet this ignores both the structural disadvantages women and minorities face and the gap between introductory coding skills and the qualifications needed to work as a software engineer. How does learning to code fit into this longer and rockier path to success? The answer to this question is seldom articulated by mainstream coding advocacy groups. Yet their implicit model of opportunity is essential to the rationale of policy efforts aimed at transforming K12 education for every American, and therefore demands scrutiny.

In addition to exposing the assumptions behind the dominant discourse, I explore alternative, potentially oppositional coding discourses by examining policy initiatives with a social justice focus and coding efforts by and for underrepresented groups. These efforts not only grapple more candidly with structural discrimination but also assert different goals and priorities for the coding movement. Alternative coding discourses hold the potential for “a new politics of truth” that recognizes that minority empowerment will require changes in social practices and distributions of power, not just technical training.<sup>4</sup>

### **The dominant coding discourse: Empowerment as economic imperative**

To characterize the dominant discourse on coding, I focus on materials by two major actor groups. The first is Code.org and its affiliated organizations, who are responsible for the most visible public engagement efforts: Computer Science Education Week and the Hour of Code. Code.org is a nonprofit founded in 2013 by Iranian-American entrepreneur Hadi Partovi to address what he called “the computer education crisis.”<sup>5</sup> On February 26, 2013 the group posted a YouTube video called “What Most Schools Don’t Teach” that featured famous tech industry figures; the video quickly went viral and catapulted Code.org into public view. In July of 2013, Code.org arranged to take over the operation of CSEdWeek from the academic coalition that had started it. Code.org provided a significant increase in funding from the Partovis’ personal fortunes

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<sup>4</sup> Foucault argued that in each society there is “a battle about the status of truth and the economic and political role it plays.... The problem is ... detaching the power of truth from the forms of hegemony, social, economic and cultural, within which it operates” (Michel Foucault, “Truth and Power,” in *Power/Knowledge: Selected Interviews and Other Writings, 1972-1977* (Vintage, 1980), 132-133).

<sup>5</sup> John Cook, “We Need More Geeks,” *GeekWire*, January 22 2013.

and introduced its signature activity, the “Hour of Code.” The Code.org website offers access to Hour of Code activities and other online training but also enlists the public in its efforts to lobby state governments to include computer science in public schools. The website and video address themselves to “students,” “educators,” and “anybody” who wants to learn to code.

The second group of actors is the Obama administration and its agencies (notably the National Science Foundation), which has been responsible for major public policy initiatives, related research and education funding, and highly visible publicity for the coding movement. The White House was drawn into the movement during the December 2013 CSEdWeek, when Obama posted a video message urging “young Americans like you” to take up coding; this message was further elaborated in blog posts describing NSF’s ongoing work in computer science pedagogy. In December 2014 Obama himself participated in the Hour of Code and announced new efforts to support computer science education. In January 2016 Obama mentioned “helping students learn to write computer code” in his final State of the Union address and later announced Computer Science For All, which focuses on supporting K12 computer science. Most of the White House speeches, blog posts, and fact sheets are aimed broadly at the general American public, though some videos are addressed directly to the “young Americans” who are the main target of the coding movement.

The first set of questions I asked of these sources was how they frame opportunity and empowerment. Who benefits from coding, and how is success defined? What is the actual mechanism by which coding is claimed to empower underrepresented minorities and women? Are structural obstacles addressed?

At first glance, the Code.org website and video portray the goal of the coding movement as individual empowerment. Much of this message is conveyed visually, with banner images that show girls and people of color looking confident and engaged while holding or using computers.<sup>6</sup> [Figure 1, Figure 2.] Captions reinforce the message of empowerment: “If you can change technology you can change the world.” [Figure 3.] The industry executives featured in the video make vague but enticing promises about

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<sup>6</sup> Code.org home page.

empowerment, as when Gabe Newell of Valve tells young viewers, “The programmers of tomorrow are the wizards of the future. You’re going to look like you have magic powers compared to everybody else.”<sup>7</sup>

Yet there is an undercurrent of anxiety to these promises, because the coding groups also articulate what may be called a “discourse of coding inevitability”: software is everywhere, therefore all jobs require a knowledge of coding—and those who don’t learn will be left behind. Obama declared in a 2016 speech, “In the new economy, computer science isn’t an optional skill – it’s a basic skill, right along with the three ‘Rs.’”<sup>8</sup> Drew Houston, creator of Dropbox, warns in the Code.org video, “Even if you want to be a racecar driver, or play baseball, or build a house: all of these things have been turned upside down by software.” Bronwen Grimes of Valve makes a similar claim: “Computers are everywhere. You want to work in agriculture? Do you want to work in entertainment? Do you want to work in manufacturing? It’s just all over.” Yet the speakers rarely give any hint of what *type* of computer expertise might actually be needed in these fields. Such vagueness suggests that this discourse does not arise from a demand for coders in these non-computing fields, but rather from Code.org’s desire to interest more children in coding and to convince policy makers that the economic benefits of K12 computer science would go beyond the tech industry. Code.org founder Partovi articulated this argument in a January 2013 interview: “It is not just a Microsoft and Google and Facebook problem. It is a problem that will face this country’s banks and the media industry and manufacturing, auto suppliers — everyone needs computer programmers.”<sup>9</sup>

Comments such as Partovi’s shift the beneficiary of the coding movement from the individual learner to the US economy. Beyond the inspirational messages of the Code.org homepage are pages rife with statistics about unfilled computer jobs and their purported economic cost, meant to justify teaching computer science in public schools.<sup>10</sup> The Code.org video hints at the economic motives behind the push to for K12 computer science, as when Facebook’s Mark Zuckerberg laments, “The whole limit in the system is

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<sup>7</sup> Code.org, “What Most Schools Don’t Teach,” 2013.

<sup>8</sup> Obama, “Computer Science for All.”

<sup>9</sup> Cook, “We Need More Geeks.”

<sup>10</sup> <https://code.org/promote>

that there just aren't enough people who are trained and have these skills today." In its closing titles the video's rhetoric shifts decisively from personal empowerment to helping the US economy and employers, warning that if schools don't teach children to code, "1 million of the best jobs in America may go unfilled." Partovi reveals similar motives in his 2013 interview with John Cook of GeekWire, a Seattle-based tech industry news site: "The actual need for software programmers now is something that hits every single (part) of the economy.... The economic impact of not educating our kids for the jobs we need over the 10-year time frame is going to be on the order of \$300 billion a year."<sup>11</sup>

The Obama administration's statements also split their emphasis between serving the individual and the national economy. Obama's January 2016 announcement of the "Computer Science For All" initiative presents coding as both an economic and an equity issue: "How can we make sure everyone has a fair shot at success in this new economy?" [Figure 4.] In his video for CSEdWeek in December 2013, Obama told US students, "Learning these skills isn't just important for your future; it's important for our country's future. If we want America to stay on the cutting edge, we need young Americans like you to master the tools and technology."<sup>12</sup> A White House blog post later that week described intrinsic rewards for the individual—"We suspect you will find coding fun, creative, and intellectually challenging"—as well as immediate practice benefits, promising, "With a little practice you too will be able to create your own games, websites, and applications."<sup>13</sup> But this cheerful advice was combined with warnings that the US might fall behind its economic competitors: "The UK recently added computer science to its curriculum, teaching CS to all students from ages 5 to 17. China teaches all of its students one year of computer science."<sup>14</sup> While Obama's speeches on coding often address young people directly with promises of empowerment, the accompanying "Fact Sheets" elaborate more drily on the economic agenda. For example, the 2014 Fact Sheet for CSEdWeek cited statistics to explain the policy rationale for pushing computer science in schools: "If current trends continue, 1.4 million computer science-related jobs will be available over the next ten years, but only 400,000 computer science graduates

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<sup>11</sup> Cook, "We Need More Geeks."

<sup>12</sup> Barack Obama, "Computer Science Education Week 2013 [Video]," at 0:15.

<sup>13</sup> DeLoura and Paris, "Don't Just Play on Your Phone, Program It."

<sup>14</sup> Ibid.

will be added with the skills to apply for those jobs. ... That is why ... the President praised efforts to get more computer science into K-12 schools.”<sup>15</sup>

Given its dual agenda of helping the individual and the economy, how is success defined for the coding movement? In most sources, success is constructed narrowly as getting a job that will contribute to the current socio-economic system. Whatever intrinsic pleasure coding might provide the individual, the overriding goal for the Obama administration is placing Americans in tech jobs and—as an assumed result—maintaining America’s competitiveness with its global rivals. Likewise, the Code.org video emphasizes the economic definition of success by featuring wealthy tech entrepreneurs who are meant to provide career role models. (In an awkward attempt to make them more “relatable” to young people, all of the speakers are identified by first name only. [Figure 5].) Asked in 2013, “What does success look like for Code.org?”, Partovi described a plan to persuade the American public that the shortage of programmers was a “national crisis” that justified turning public schools into a supply pipeline. “Success in three months is that this is a topic that, by and large, Americans realize is a problem, not just the tech industry.... Success in five years is that the majority of American high schools, and even middle schools, offer some sort of instruction.”<sup>16</sup> Benefits for individuals or underrepresented groups were nowhere in this initial list of goals. In urging children and parents to embrace coding for the sake of the US economy, the dominant coding discourse embodies some key tenets of neoliberalism: that markets are perfect arbiters of the value of workers; that the role of education is to create “human capital” for the economy; that the role of the state is to feed the demands of the market; and that morality consists of rational self-interest.<sup>17</sup> Self-interest is the primary rationale given for empowering underrepresented groups: not to serve social justice but the demands of the labor market.

While Code.org’s website and video give lip service to “changing the world,” the type of change envisioned seems no more radical than creating a popular app. Dropbox’s

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<sup>15</sup> The White House, Office of the Press Secretary. “Fact Sheet: New Commitments to Support Computer Science Education,” December 8, 2014.

<sup>16</sup> Cook, “We Need More Geeks.”

<sup>17</sup> Rebecca Lave, Philip Mirowski, and Samuel Randalls, “STS and Neoliberal Science,” *Social Studies of Science* 40, no. 5 (2010).

Houston celebrates this circumscribed notion of empowerment — “To be able to actually come up with an idea and then see it in your hands and then be able to press a button and have it be in millions of people’s hands” — as does Facebook’s Zuckerberg: “Just to think that you can start something in your college dorm room... that a billion people use as part of their daily lives.” For 2013 CSEdWeek Obama urged young Americans, “Don’t just buy a new video game—make one! Don’t just download the latest app—help design it.”<sup>18</sup> “Changing the world” does not include challenging the culture or values of the tech industry.

Given its focus on employment, the coding discourse is curiously vague about the process by which coding could plausibly lead underrepresented groups to well-paying jobs. Code.org describes itself as dedicated to “increasing participation by women and underrepresented students of color.”<sup>19</sup> Yet its two main activities, running the Hour of Code (and other learn-to-code activities) and lobbying for K12 computer science, are only weakly connected to the goal of increasing minority participation in academia or industry. The foregrounding of the Hour of Code as a contribution to diversity in computing demands a faith that even a limited exposure to coding will be meaningfully empowering. Somewhat contradicting this stance, the site’s tagline — “Every student in every school should have the opportunity to learn computer science” — implies that sustained formal study of computer science is needed. (Partovi dismisses this confusion, essentially admitting that Code.org’s strategy is to mobilize parents’ anxiety about their children’s economic future: “I believe most people don’t care about the difference between code and computer science. They just feel technology is passing them by quickly, and they don’t want their kids to suffer the same fate.”<sup>20</sup>)

Even if students go beyond the Hour of Code to take computer science classes, the path to eventual employment is never laid out. The Code.org video simply erases the gap between studying computer science and landing lucrative a job, declaring, “1 million of the best jobs in America may go unfilled... because only 1 in 4 schools teach computer science.”<sup>21</sup> By this logic, the only obstacle to women and minorities getting “the best jobs

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<sup>18</sup> Obama, “Computer Science Education Week 2013 [Video]”, 0:30.

<sup>19</sup> <https://code.org/about>.

<sup>20</sup> Hadi Partovi, “The ‘Secret Agenda’ of Code.Org,” <http://blog.code.org/post/73963049605/>.

<sup>21</sup> Code.org, “What Most Schools Don’t Teach,” ellipsis in original.

in America” is a curricular intervention in public schools. The Obama administration similarly depicts studying computer science as leading seamlessly to employment simply because the jobs exist: “Computer science also leads to great jobs. The Bureau of Labor Statistics projects that by 2020 there will be 1.4 million computer-science-related jobs available.”<sup>22</sup> Partovi’s 2013 interview is breathtakingly simplistic in painting coding as an instant path to wealth for disadvantaged groups. In his only reference to the needs of workers (as opposed to employers), he argues, “The fastest way if you are in the 99 percent and want to join the one percent ... the easiest way to equalize your opportunity is to learn computer programming.”<sup>23</sup> Even some high-profile software experts have critiqued the coding discourse for implying “that there’s a thin, easily permeable membrane between learning to program and getting paid to program professionally.”<sup>24</sup>

A closer examination of coding discourse reveals a slippage between “opportunity” as the ability to get a well-paying job, or to create technology—concrete outcomes for the individual—and “opportunity” as the chance to study coding or computer science—merely a means to an end for most people. For example, Code.org’s homepage quotes Facebook COO Sheryl Sandberg asserting, “Our children—including our girls—need the opportunity to learn computer science.” [Figure 6.] This slippage allows the tech industry’s diversity problem to be attributed to too few women and minorities getting the proper training. Since the dominant coding discourse frames the problem of opportunity as one of education, the only structural obstacles addressed are within the educational system. For example, the Obama administration reported in 2014, “NSF has invested in research into and development of curricula, course materials, pedagogy, scalable models of teacher preparation, and approaches to sustainable, ongoing teacher support,” while Code.org promised to provide elementary school teachers with “curriculum, professional development, and year-round support.”<sup>25</sup> Yet there is evidence that underrepresentation is not due to a lack of minority workers with technical skills but rather to employers’ unwillingness to alter practices and attitudes that exclude minority job-seekers. A 2016

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<sup>22</sup> Tom Kalil and Farnam Jahanian, “Computer Science Is for Everyone!” <https://www.whitehouse.gov/blog/2013/12/11/>.

<sup>23</sup> Cook, “We Need More Geeks.”

<sup>24</sup> Jeff Atwood, “Please Don’t Learn to Code,” 2012, <http://blog.codinghorror.com/>

<sup>25</sup> The White House, “Fact Sheet: New Commitments to Support Computer Science Education.”



study by University of Connecticut sociologist Maya A. Beasley debunked the tech industry’s claims that their low diversity numbers were due to a lack of blacks and Latinos “in the pipeline,” showing that these groups were hired by big tech companies at only half the rate at which they received CS degrees. Beasley attributed the problem instead to “the culture and recruiting methods of tech companies.”<sup>26</sup>

### **The dominant coding discourse: Framing expertise**

Social studies of science have demonstrated how attributions of technical skill—and the associated rewards—have often been tied to social hierarchies.<sup>27</sup> Do constructions of skill in the coding movement tend to preserve or challenge technical mastery as the domain of white or Asian males? How does the culture of the tech industry shape what expertise “looks like” among potential workers and entrepreneurs?

Insofar as the coding movement advocates cultural change, it consists of popularizing the idea that coding is a path to success for underrepresented groups and offering role models who are black, Latino, or female. In Obama’s 2013 CSEdWeek speech, he urged young Americans to ignore cultural messages that reinforce stereotypes about who can succeed in computer science:

No one’s born a computer scientist, but with a little hard work—and some math and science—just about anyone can become one. And don’t let anyone tell you you can’t. Whether you’re a young man or a young woman, whether you live in a city or a rural area, computers are going to be a big part of your future, and if you’re willing to work and study hard, that future is yours to shape.<sup>28</sup>

Obama’s emphasis on “hard work” rather than “inborn” qualities undercuts the association of computer skill with white or Asian male bodies. Most dramatically, the

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<sup>26</sup> Quoctrung Bui and Claire Cain Miller. “Why Tech Degrees Are Not Putting More Blacks and Hispanics Into Tech Jobs.” *New York Times*, Feb. 25, 2016. <http://www.nytimes.com/2016/02/26/>

<sup>27</sup> For technical skill and gender hierarchies, see Janet Abbate, *Recoding Gender* (MIT, 2012); Cynthia Cockburn, *Machinery of Dominance* (Northeastern, 1988); Ruth Oldenziel, *Making Technology Masculine* (Amsterdam University Press, 1999); Judy Wajcman, “Patriarchy, Technology, and Conceptions of Skill,” *Work and Occupations* 18:1 (1991): 29–45. For technical skill and racial hierarchies, see Amy Slaton, *Race, Rigor, and Selectivity in U.S. Engineering: The History of an Occupational Color Line* (Harvard, 2010); Jane Margolis, Rachel Estrella, Joanna Goode, Jennifer Jellison Holme, and Kimberley Nao, *Stuck in the Shallow End: Education, Race, and Computing* (MIT Press, 2008).

<sup>28</sup> Obama, “Computer Science Education Week 2013 [Video],” 0:40.

video of Obama participating in the 2014 Hour of Code shows the world's most powerful leader being taught programming by a young black girl, visually presenting a minority female as the ultimate technical authority.<sup>29</sup> [Figure 7].

The Code.org website also deploys imagery to challenge the assumption that computing is for white or Asian males only. Most of its banner photos feature women, including black and Muslim girls. [Figure 8.] A photo of a black boy at a computer addresses black viewers directly with the caption, "Computer science isn't for someone else. It's for you, here, now." [Figure 9.] Similarly, the Code.org video, while it foregrounds white males like Bill Gates and Mark Zuckerberg, also gives air time to four women and three black men.

Yet a closer look at the video reveals a disconnect from race and gender issues. It is striking that none of the black men in the video are currently employed in the tech industry: one is the hip-hop artist will.i.am, who has invested in tech ventures but did not make his fame or fortune through computing; another is NBA basketball player Chris Bosh, who is described as having "coded in college"; the third is Makinde Adeagbo, an "early Facebook engineer" who is now employed as a track coach. What does it say that the Code.org video producers could not find a single black software engineer to include? Bosh, though an outsider to the tech industry, provides the video's most revealing comments about race and opportunity:

When I was in school I was in this after-school group called the Whiz Kids, and when people found out they laughed at me and, you know, all these things. And I'm like, 'Man, I don't care, I think it's cool and I'm learning a lot. And'—raising eyebrows for emphasis—"some of my friends have *jobs!*'

Unlike the white speakers, who treat their youthful access to computers and jobs as unremarkable, Bosh points out that being a computer nerd did not fit comfortably with cultural assumptions about blackness, and that having a job was not something a black teen could take for granted.

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<sup>29</sup> The White House, "Hour of Code [video]," December 8, 2014.

Likewise, some of the women in the video acknowledge aspects of computing culture that deter girls and women, but this is mostly done implicitly, rather than directly criticizing the dominant culture. For example, they downplay the stereotype that success in computing requires “genius”—though without noting that “genius” encodes gender bias since it is culturally tied to masculinity. Vanessa Hurst, co-founder of “Girl Develop It,” assures viewers, “You don’t have to be a genius to learn how to code.” Bronwen Grimes of Valve makes a similar comment in which she compares coding with reading, a skill more associated with girls: “You don’t have to be a genius to code. Do you have to be a genius to read?” Significantly, none of the men discount “genius” in this way. The female speakers also appeal to girls’ greater interest in using computers for social good—again without pointing this out as a gender difference. Hurst comments, “I think if someone had told me that software is really about humanity, that it’s really about helping people by using computer technology, it would have changed my outlook a lot earlier.” In this reflection she unintentionally highlights the fact that the goal of social good is *not* highly valued or publicized in the masculine mainstream of the tech industry.

The video also undercuts its own message of inclusivity by unwittingly displaying how much Silicon Valley revolves around the beliefs and preferences of white/Asian men. Its depictions of the “awesome” computing workplace, meant to entice the viewer, also display the gender and racial disparities that characterize the industry. Scenes of tech offices are dominated by white and Asian men [Figure 10, video 2:59], save for one scene where a group of women in a conference room listen as the sole man in the room speaks [Figure 11, video 3:01]. A cluster of young white and Asian men enjoying “video games and scooters” at the office is almost a parody of the “male computer geek” stereotype. [Figure 12, video 3:49.] Even references to the perks that tech workers enjoy, such as “free laundry” and “free food—breakfast, lunch, and dinner,” inadvertently highlight the long work hours that keep tech workers from their homes and that deter many women who desire work-life balance.

The ways in which Code.org refers to skill also reveal how tech industry culture reproduces a narrow stereotype of the technical expert. In his 2013 article about Partovi, reporter John Cook refers to competition for programmers “in tech hotbeds like Seattle and San Francisco where a war for talent rages. Simply put, there just aren’t enough top-

notch engineers to go around.”<sup>30</sup> His references to “talent” and “top-notch engineers” reflect the tech industry’s strategy of trying to lure elite workers (typically those who attended schools such as Stanford, MIT, and Carnegie Mellon) with salaries and perks, rather than widening their net to consider more diverse workers. The Code.org video uses similar language in describing the perks offered to capture “talent” and “the very best people.” DropBox’s Houston says, “To get the very best people we try to make the office as awesome as possible,” while Zuckerberg declares, “Our policy [at Facebook] is literally to hire as many talented engineers as we can find.” Given that Facebook’s technical workforce is 85% male and 94% white or Asian, the implication is that female and black engineers were not hired because they were not “talented.”<sup>31</sup>

The fixation on hiring elite workers reinforces one of the tech industry’s most ingrained myths: that it is a meritocracy. Industry veteran and activist Freeda Kapur Klein, whose Level Playing Field Institute works to increase diversity in corporate America, argues that this belief is largely responsible for naturalizing the underrepresentation of women and non-Asian minorities. “The central issue to the lack of diversity in tech is the tenacious myth that Silicon Valley and tech more broadly are perfect meritocracies.... The implication of that is that there’s something wrong with African Americans, Latinos, and women from all backgrounds, as opposed to there being something deeply biased about tech.”<sup>32</sup> Partovi’s 2013 interview illustrates this dynamic, as he invokes the supposed neutrality of the machine itself to absolve the entire industry of bias: “It is one of these skills where the computer doesn’t care if you are black or white or a girl or boy or old or young: as long as you know how to speak the language of code, the computer will do what you want. And if you are good at it, you can make a lot of money.”<sup>33</sup> The possibility of discrimination by employers (as opposed to machines) is never mentioned, the implication being that employers will objectively assess coding skill. Those who are not hired for well-paying jobs simply weren’t “good at it.”

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<sup>30</sup> Cook, “We Need More Geeks.”

<sup>31</sup> Facebook diversity report from June 2014, <http://newsroom.fb.com/news/2014/06/building-a-more-diverse-facebook/>

<sup>32</sup> Quoted in Donovan X. Ramsey, “Twitter’s White-People Problem,” *The Nation*, January 6, 2016.

<sup>33</sup> Cook, “We Need More Geeks.”

The Obama administration does acknowledge some exclusionary aspects of computer culture in its discussion of computer science courses funded by NSF, an agency with a long history of trying to draw women and minorities into science. A 2013 blog post describing NSF’s curriculum efforts notes, “These courses were designed to be accessible and engaging for *all* students, with the particular goal of increasing inclusion of women and other groups that are significantly underrepresented in computing.”<sup>34</sup> The implication is that existing CS courses are *not* designed for “all students” but are skewed toward the interests of the white/Asian males who dominate them. A 2014 Fact Sheet describing progress on the Advanced Placement computer science course suggests ways in which computer science pedagogy could be realigned to mesh with the interests, values, and strengths of women and minorities. “The course will draw more students into the discipline by focusing on ... the creative aspects of computing. The inherently multidisciplinary course teaches students to ... collaborate to find solutions to real-world issues.”<sup>35</sup> Here NSF incorporates the awareness that girls and minorities are more likely to bring—and value—interpersonal skills, an interest in using computers for social good, and a desire to integrate purely technical skills with skills from other disciplines such as the arts. Whether they will find those same skills and interests valued in the technical job market, however, is an unanswered question.

In summary, the dominant coding discourse promises empowerment for groups underrepresented in computing, but within a conservative neoliberal framework. Inclusion of these groups is justified mainly in terms of national economic interests, and success is defined as advancing within the existing work culture, rather than as changing computer culture to be more welcoming or meaningful to women and minorities. Framing the individual’s lack of skill as the cause of their disadvantage—“you could be wealthy if only you learned to code”—is profoundly conservative. Likewise, the tech industry’s focus on “top talent” and its claims to meritocracy essentially put the blame on women and minorities for their own underrepresentation, rather than acknowledging discrimination on the path between gaining skills and getting a job.

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<sup>34</sup> Kalil and Jahanian, “Computer Science Is for Everyone!” (emphasis in original).

<sup>35</sup> The White House, “Fact Sheet: New Commitments to Support Computer Science Education.”

## Alternative discourses

Code.org and Obama's Computer Science For All are high-profile, well-funded, celebrity-studded efforts that have dominated the public discourse on coding. To explore the potential for alternative discourses on coding, I examine two sets of activities that are related to but distinct from these efforts and that provide different models for understanding skill and opportunity in relation to computing. The first is the Obama initiatives TechHire and My Brother's Keeper, which were launched separately from the administration's computer science initiatives and present a more nuanced and pragmatic view of the obstacles to minority opportunity. The second is the work of coding organizations created by and for members of underrepresented minorities. While these groups are aligned in many ways with mainstream coding discourse, they also challenge some of the dominant goals, priorities, methods, and definitions of expertise and success.

### *TechHire and My Brother's Keeper*

President Obama launched the TechHire initiative in March 2015 "to work with communities to get more Americans rapidly trained for well-paying technology jobs."<sup>36</sup> Participating cities (and a few rural areas) agreed to work with local employers to develop new training and hiring practices to connect unemployed residents with technical jobs. While the press release for the initiative repeatedly invokes "middle class economics" rather than help for disadvantaged groups, there are coded references to "empowering a diverse array of Americans" and "reaching under-served populations," and some of the community programs affiliated with TechHire explicitly target "women and underrepresented minorities."<sup>37</sup>

TechHire shares with the coding initiatives an emphasis on technical training for jobs, but it frames opportunity in significantly different ways. First, TechHire admits that the job market as currently structured presents barriers to those who do not fit the mold of the Anglo, able-bodied male with no parental duties. As part of the program, the Department of Labor will provide grants "to support innovative approaches to training and successfully employing individuals who face barriers to training and employment,

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<sup>36</sup> Megan Smith and Jeffrey Zients, "President Obama Launches Techhire," <https://www.whitehouse.gov/blog/2015/03/10/>.

<sup>37</sup> Ibid.

including those with child care responsibilities, people with disabilities, disconnected youth, and limited English proficient workers.”<sup>38</sup> Second, TechHire recognizes that getting people interested in or minimally trained for technical work (as the coding movement seeks to do) does not automatically result in them getting hired (as the coding movement implies). On the contrary, TechHire acknowledges that social barriers may be as formidable as a lack of training. Obama used the story of a black woman, LaShana Lewis, to illustrate this:

LaShana grew up in East St. Louis with a passion for computers. But without a college degree, she couldn’t even get an interview for a tech job. So she spent 12 years as a bus driver and in entry-level jobs. But with help of entrepreneurial new training organizations like LaunchCode which helped give her skills and vouched for her, she’s now an Associate System Engineer.<sup>39</sup>

In Obama’s framing, Lewis’s problem as a working-class black woman was not a lack of interest or aptitude, but a lack of credentials (the college degree) and a lack of well-placed social connections (to recommend her to employers).

TechHire addresses these social realities by focusing not only on training the individual but also on changing industry hiring and credentialing practices to be less discriminatory. Training programs such as “coding bootcamps” are only one part of the package that participating communities commit to. Employers are also expected to reexamine their bias against “nontraditional” credentials and applicants: “Communities ... will work with employers to build willingness to hire from both nontraditional and traditional training programs; and communities will work with employers to review—and upgrade—their recruiting and hiring practices to enable non-traditional hiring.” TechHire also seeks to create for underrepresented groups the kinds of reputation-enhancing social networks that white middle-class job-seekers take for granted. “Communities will build local strategies and partnerships to connect people to jobs.... working with industry-trusted organizations, which will vouch for those who have the skills to do the job but

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<sup>38</sup> Ibid.

<sup>39</sup> Ibid.

who may lack the typical profile of degrees and career experience.”<sup>40</sup> Here is an explicit acknowledgement that having “the skills to do the job” is not enough if one lacks connections or does not fit the stereotyped “profile” of an acceptable applicant. TechHire shifts the discourse from training as a cure-all to training as one piece in a larger reform of employment practices.

A similar realism can be seen in My Brother’s Keeper, an initiative introduced by Obama in February 2014 to help young men of color. Obama referred to the systematic and intergenerational effects of racism, noting, “Fifty years after Dr. King talked about his dream for America’s children, the stubborn fact is that the life chances of the average black or brown child in this country lags behind by almost every measure, and is worse for boys and young men.”<sup>41</sup> As one response, My Brother’s Keeper coordinates efforts by the federal government and philanthropic organizations to disseminate evidence-based interventions in early education, employment, and criminal justice.<sup>42</sup> Initially the program did not include coding or technology, but in February 2016 the White House blog announced a new STEM track for My Brother’s Keeper, invoking the “half-million job openings in information technology” awaiting minority youth.<sup>43</sup>

Like the coding movement, the MBK STEM program constructs technical knowledge as a route to economic success, and the first of the program’s four stages of intervention—“exposure [to] STEM-based activities to pique the interest of students”—is reminiscent of the Hour of Code. But the MBK program goes well beyond introductory training to foreground the need for work experience, job placement, and combating bias. It rejects the assumption, embedded in the dominant coding discourse, that technical skills will lead automatically to jobs. “Acquiring skills is not enough,” the announcement declares; “America’s youth need employment opportunities to make use of their STEM skills.”<sup>44</sup> To fill in the gap between skills and jobs, the program’s second stage provides real-world “training & apprenticeship” that will offer “opportunities to engage directly in

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<sup>40</sup> The White House, Office of the Press Secretary. “Fact Sheet: President Obama Launches New Techhire Initiative,” March 9, 2015.

<sup>41</sup> Barack Obama, “Remarks by the President on ‘My Brother’s Keeper’ Initiative,” February 27, 2014.

<sup>42</sup> Ibid.

<sup>43</sup> Michael Smith, Marvin Carr, Jordan Brooks, and Quincy Brown, “Engaging America’s Youth in STEM through Hands-on Experiences in Labs and Communities across America.” <https://www.whitehouse.gov/blog/2016/02/27/>.

<sup>44</sup> Ibid.



the work... and will enable young people to transition from the training environment to the labor market.” This highlights that work experience, and the reputational networks it builds, are vital to becoming employable. The third step is help with job placement and entrepreneurship, highlighting the disconnect that often exists between people of color and the practices that employees or investors use to recruit, evaluate, and hire or fund candidates. The fourth stage recognizes that discrimination does not end once the individual has found a job: “Combating conscious and unconscious bias and institutional barriers that impact the ability for all young people to rise to leadership and advance professionally in all sectors.” In these ways My Brother’s Keeper, like TechHire, shifts the focus from technical training to the social processes of recruiting and hiring—practices that are fraught with bias and that are largely ignored in the dominant coding discourse. While the goals of these programs are similar to the coding movement—employing underrepresented groups in technical jobs—the methods are more complex, demanding that not only the individual job-seeker but industry itself must change.

#### *Identity-based coding organizations*

In the years since CSEdWeek was launched nationally in 2009, a number of smaller, more local efforts have focused on teaching coding or entrepreneurship to specific identity-based groups such as girls, blacks, or Latinos. I will discuss several examples that articulate critical perspectives from within the coding movement. Code2040 was founded by tech industry veterans Laura Weidman Powers and Tristan Walker in 2012 to provide paths to tech careers for blacks and Latinos; the name refers to the fact that in 2040 these groups are projected to become the demographic majority in the US.<sup>45</sup> The organization does not teach coding but instead helps already-trained black and Latino programmers find work or startup funding. “Code as a Second Language” is a program of the nonprofit Hispanic Heritage Foundation that teaches coding to high school students. CSL students are also included in a larger program called LOFT (Latinos On Fast Track) that provides ongoing training, mentoring, networking, and internship and job placement.<sup>46</sup> #YesWeCode (a play on Obama’s “Yes We Can” campaign slogan) was

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<sup>45</sup> Blacks In Technology, “Code2040 — Shaping the Future for Minority Coders,” 2012. <https://www.blacksintechology.net/code2040/>

<sup>46</sup> “Code as a Second Language,” <http://www.loftcsf.org/>; “Latinos On Fast Track,”

started in 2014 by civil rights leader and former Obama advisor Van Jones. As part of Jones's nonprofit Dream Corps, #YesWeCode is integrated into a broader social mission that aims to reduce prison populations and "build an inclusive green economy strong enough to lift people out of poverty."<sup>47</sup> #YesWeCode's website describes its mission as "uplifting young African-American men and boys": "We believe that one solution lies in connecting tech and social justice leaders to spearhead revolutionary tech programs whose benefits extend to the most disadvantaged of society."<sup>48</sup> #YesWeCode works closely with Qeyno Labs, an organization founded by anti-poverty activist Kalimah Priforce that holds free hackathons for minority youth. Qeyno Labs describes its students as "High potential youth in low opportunity settings," relocating the problem of unemployment from the students themselves to their social conditions.<sup>49</sup>

Identity-based coding groups share some assumptions and tactics with the dominant discourse. Unsurprisingly, they join the dominant groups in challenging the stereotype that technical expertise is the preserve of white/Asian men. All of the groups' websites have prominent visual representations of women and men of color smiling confidently or focusing intently as they use computers. [Figure 13.] The Code2040 homepage shows an image of well-dressed young black and Latino men and women with the caption, "This is the future of tech." [Figure 14.] Staff images show men and women of color in charge of these organizations. [Figure 15.] #YesWeCode describes its November 2014 hackathon as welcoming a broad range of marginalized groups: "young men of color (Black, Latino, Native-American, and under-represented Asian & Pacific Islander) together with young women of color [and] transgender youth."<sup>50</sup> Jones of #YesWeCode challenges the tech industry's stereotypical notion of "genius" in a 2014 *Essence* interview: "Silicon Valley is supposedly built on genius, that's their mythology. But you're not including all the geniuses that are out there. How many products and services is Silicon Valley not creating because they don't have people from different backgrounds in the room to come up with the next big idea?"<sup>51</sup>

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<sup>47</sup> <http://www.hispanicheritage.org/loft.php>.

<sup>48</sup> "Dream Corps: Our Mission and Work," <http://www.thedreamcorps.org/mission>.

<sup>49</sup> <http://www.yeswecode.org/mission>

<sup>50</sup> <http://www.qeyno.com/>

<sup>51</sup> <http://www.yeswecodehack.com/>

<sup>51</sup> *Essence*, "Van Jones: Giving Black Geniuses Tools to Win with #Yeswecode," *Essence*, May 2, 2014.

The identity-based organizations also partake of the dominant discourse that coding has become an inevitable requirement for future jobs. Jones of #YesWeCode warns, “We are heading towards a world of code or be coded.”<sup>52</sup> “Code as a Second Language” draws an analogy with English as a second language as an essential skill for Latinos to learn. All of the organizations portray coding as a route to well-paid employment for the most economically disadvantaged. Along with this primary mission, the identity groups echo the dominant discourse’s emphasis on serving the US economy and employers—perhaps in deference to the corporate sponsors who fund these nonprofit groups. Code2040’s Laura Weidman commented in a 2012 interview, “Currently, blacks and Latino/as are not participating in technology and tech entrepreneurship in large numbers – yet before long, they’ll make up a huge portion of the workforce. We have to ensure that they’re able to succeed and lead in this space or we’re going to have an even more severe talent crunch in technology and innovation in the future than we’re seeing now.”<sup>53</sup> Jose Antonio Tijerino, president and CEO of the Hispanic Heritage Foundation, described a program to teach coding to immigrants as a boost for the US economy: “We want to help immigrants provide America with a value proposition in the workforce.”<sup>54</sup>

But the identity-based groups also raise important challenges to the dominant discourse. First, they name and seek to address the social and structural obstacles that face minority groups—a task that may take priority over technical training. Priforce declares on Qeyno Labs’s homepage, “Poverty is neither desperation nor deprivation. Poverty is isolation. The first thing we teach our kids to hack is their isolation.”<sup>55</sup> [Figure 16.] “Isolation” encompasses a lack of mentors and role models, peers to collaborate with, and the type of “weak social ties” that can lead to job referrals.<sup>56</sup> Code 2040’s Weidman tackles bias in Silicon Valley’s structures of opportunity that systematically exclude blacks and Latinos. She notes how the “old boy network,” in which “companies tend to look to their employees’ networks for potential hires,” functions to reproduce the

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<sup>52</sup> Demetria Irwin, “Facebook, #Yeswecode Make a Splash at the Essence Music Festival,” *The Grio*, July 6, 2014 2014.

<sup>53</sup> Blacks In Technology, “Code2040.”

<sup>54</sup> Hispanic Heritage Foundation, “Hispanic Heritage Foundation Hosts Groundbreaking Loft Latin@Coder Summit at Stanford University on May 2nd,” *PRNewswire*, May 1, 2015.

<sup>55</sup> <http://www.qeyno.com/>

<sup>56</sup> Mark Granovetter, “The Strength of Weak Ties,” *American Journal of Sociology* 78, no. May (1973).

largely white/Asian male workforce. Underrepresented groups also lack insider knowledge about Silicon Valley companies: “It can be hard to even figure out which companies are hiring or could be a good fit for you without someone to help you navigate the waters.” Another deterrent to people from disadvantaged backgrounds is the perceived risk of working for a startup, since they have fewer resources to fall back on if the company fails and may feel more obligation to maintain a stable income to support extended family members.<sup>57</sup>

Weidman also challenges the belief that Silicon Valley is a meritocracy where white and Asian males have reached a dominant position through ability alone. Asked by an interviewer, “How do you feel about the notion that there shouldn’t be an organization that caters to a section of the population such as minorities and that everyone should make it on their own merit?” she replied, “At CODE2040 we believe strongly in the importance of making it on the strength of one’s merits. However, the ability to do just that is predicated on having the opportunity to showcase one’s merits in the first place.”<sup>58</sup> Here Weidman reconstructs perceived “merit” as a function of social access and cultural fit, not purely talent. The racial logic whereby “merit” is equated with credentials and experiences inaccessible to many minority individuals is made painfully clear in a blog post by Leslie Miley, who was the only black engineering manager at Twitter until he quit in 2015. Explaining why he had left, Miley recalled,

There were also the Hiring Committee meetings that became contentious when I advocated for diverse candidates. Candidates who were dinged for not being fast enough to solve problems, not having internships at ‘strong’ companies and who took too long to finish their degree.... A particularly low moment was having my question about what specific steps Twitter engineering was taking to increase diversity answered ... with ‘diversity is important, but we can’t lower the bar.’<sup>59</sup>

In their coding programs, the identity-based groups try to make up for minorities’ lack of social capital by helping marginalized individuals build the professional contacts

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<sup>57</sup> Blacks In Technology, “Code2040.”

<sup>58</sup> Ibid.

<sup>59</sup> <https://medium.com/tech-diversity-files/thought-on-diversity-part-2-why-diversity-is-difficult-3dfd552fa1f7#.jhou0ggdl>

and cultural knowledge that they need. As Code 2040's website explains, "Breaking into the tech sector requires not just skills, but the experience, confidence, and connections to apply them." Its flagship program places technically trained black and Latino students in internships with Silicon Valley or San Francisco companies, where they can begin to learn the culture and build credentials. Code 2040's Technical Applicant Prep Program gives black and Latino job-seekers insider knowledge about which tech companies are hiring and how to navigate the job-application process, so that they will not be blindsided by interview rituals such as being asked to solve a programming problem at a whiteboard. The group's Entrepreneurs in Residence program places black and Latino entrepreneurs in tech incubators in various cities, where they are provided the kinds of support that middle-class whites might expect from their family or professional network: a modest income, business space, and contact with other entrepreneurs.<sup>60</sup>

A second difference between the identity groups and other coding organizations is in their goals. While economic success is a key concern for the identity groups, they also prioritize social change as a goal, and they define empowerment in terms of the community and not just the individual or the national economy. One way in which coding is envisioned as a force for social change is by transforming negative ethnic or racial stereotypes. Hispanic Heritage Foundation's Tijerino critiques the circular logic whereby employers' failure to hire Latinos reinforces the perception that Latinos do not or cannot code: "The thought that the tech industry can't find Latino programmers leads to the notion that there aren't any Latino programmers and the next thought will be that Latinos aren't capable." By making Latino coders visible, his group hopes to "shatter stereotypes and redefine the landscape of computer technology in Silicon Valley and across America."<sup>61</sup> Similarly, #YesWeCode's origin story dramatically positions coding as a way to fight for social justice by literally changing the images associated with black youth. #YesWeCode's Kwame Anku recounted how this idea was inspired by the black musician Prince:

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<sup>60</sup> <http://www.code2040.org/programs/>

<sup>61</sup> Hispanic Heritage Foundation, "Loft Latin@Coder Summit."

Our founder, Van Jones, ... and Prince were sitting together... in the wake of the Trayvon Martin murder.... Prince was upset about what he saw and the coverage, and he asked Van the question, ‘Why is it that when we see a black kid in a hoodie, the assumption is he’s a thug, but when we see a white kid in a hoodie we think, “That’s Mark Zuckerberg”?’ ... Prince said, ‘Maybe it’s because we haven’t created enough black Mark Zuckerbergs,’ and challenged Van to create an organization to do that.<sup>62</sup>

The first #YesWeCode hackathon was held at the 2014 Essence music festival in New Orleans, where Prince agreed to perform on condition that the festival host the hackathon. [Figure 17.]

Identity-focused coding organizations also try to help their communities by creating socially relevant apps. Qeyno Labs’s Priforce critiques the difference in values behind the types of apps promoted in the privileged culture of Silicon Valley and those his hackathons support: “We are not interested in launching hackathons to build more photo sharing apps or finding pizza at 3am. We want to build and design technology that makes sense to a population that needs it.”<sup>63</sup> The press release for #YesWeCode’s Essence hackathon led off, “Tired of waiting for Silicon Valley tech companies to design solutions for their neighborhoods, New Orleans youth will unite with technologists and innovators to create their own.”<sup>64</sup> #YesWeCan’s Chief Innovation Officer, Amy Henderson, used an example from the hackathon to show how apps are not universal or socially neutral but rather serve stratified socio-economic groups: “A lot of the people who develop apps today are affluent white men and so they build apps that solve their communities’ problems, such as Über, which helps people get car service. Meanwhile, one of our young people built an app that sends reminders of upcoming court dates. That’s an issue that impacts his community, so he did something about it.”<sup>65</sup> Other projects at the hackathon focused on health issues affecting the black community, such as obesity, diabetes, and a lack of fresh food; mental health services for young people in crisis; educational support; and services for youth in foster care and victims of human

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<sup>62</sup> Joy Reid, “Teaching the Next Generation of Coders [Video],” MSNBC, November 17, 2014, 1:15.

<sup>63</sup> <https://www.prlog.org/12337721-black-mark-zuckerberg-hackathon-empowers-youth-to-transform-nola-into-their-own-silicon-valley.html>

<sup>64</sup> Ibid.

<sup>65</sup> Irwin, “Facebook, #Yeswecode Make a Splash at the Essence Music Festival.”

trafficking.<sup>66</sup> At Qeyno’s 2015 Oakland Hackathon, the winner of the “best impact award” was an app addressing the life-or-death implications of black youths’ encounters with police. Fourteen-year-old George Hofstetter designed “a mobile application for teenagers like myself—African American—to help them figure out how to act that’s not nervous or any type of suspicion towards police officers. So much has happened over the past few years that have resulted in death, that have to do with teenagers around my age. I would like to help them to know what to do.”<sup>67</sup>

Qeyno Labs also sponsored the first hackathon for Obama’s My Brother’s Keeper initiative, held in Philadelphia in November 2014, which focused on a range of social issues including “education, health, restorative justice, food & sustainability.”<sup>68</sup> The first-place winner was an app called “Creating Your Community,” which would allow young people to take photos of derelict buildings and propose new uses for them, while also connecting with local developers, designers, and contractors who could make the vision a reality. [Figure 18.] Qeyno’s Anku described the app as a tool for community self-determination: “We talk about gentrification, but these young people are saying, ‘Hey, we can transform our own community, conceptualize what *we* want, and then be able to have the local dollars stay in the community and have the community we want.”<sup>69</sup> In a similar vein, the Latino group LOFT sponsors a Video Game Innovation Fellowship that “challenges minority youths (ages 15-25) to develop video games and apps addressing social issues impacting their communities.” Winners from 2014 ranged from educational games, health information, and mentoring to more serious issues such as “Lucid: A video game that addresses and helps young people deal with death and loss of a friend or relative.”<sup>70</sup> These activities construct coding not as an end in itself or just a means to make money, but as a way to intervene directly in issues affecting one’s local community.

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<sup>66</sup> <http://www.yeswecodehack.com/> ; Monica Peters, “My Brother’s Keeper Hackathon Supports Black Youth Interested in Tech Careers” (Knight Foundation, 2014).

<sup>67</sup> Jessica Guynn, “Qeyno Labs: Changing the World One Hackathon at a Time!” [Video], USA Today, 2015, 1:31. <https://vimeo.com/121180705>.

<sup>68</sup> <http://www.yeswecodehack.com/>

<sup>69</sup> Reid, “Teaching the Next Generation of Coders [Video],” 4:50.

<sup>70</sup> <http://www.loftfellowship.org/#!2014-fellows-/c24et>

## **Conclusion**

The coding movement has popularized the notion of coding as empowerment, but it fails to locate coding within larger social formations of gender, race, and capitalism that constrain its liberatory potential. To subscribe to the dominant coding discourse is to accept the claims that technical training will lead automatically to lucrative jobs and that the purpose of educating youth is to serve the nation's economy. Speaking from their own experience at the margins of the tech economy, identity-based coding groups propose different truths about coding as empowerment. They dispute the assumption that underrepresentation results from a lack of interest, training, or aptitude among blacks and Latinos, pointing instead to systemic bias. They question whether learning coding or computer science is enough to create opportunity, given the many missing steps minorities encounter on the path between education and employment. Perhaps most radically, they ask, "Empowerment for what?" Minority youth are recast as technical contributors, not simply because they are capable of learning the mechanics of coding but because they bring an understanding of the unfilled needs of their communities for which software might provide a partial solution. In challenging the easy assumptions of the dominant discourse, these alternative discourses potentially point the way to more effective and meaningful uses of coding as a social lever.