Code Work: Thinking with the System in México

RESEARCH ARTICLE

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ABSTRACT This article explores how young people position themselves in relation to promises of technology and progress during a time of political transition in Mexico. My fieldwork took place between 2013 and 2017, just before a newly formed leftist political party gained power after a century of rule by Mexico's "revolutionary" party. For self-identified "disenchanted" youth in Mexico, skeptical of the promises of social mobility by means of formal education, "hacking" emerged as a way to make sense of their futures in a precarious state and economy and as a way to let their "code work" intervene in narratives that had only delivered false hopes. Coworking spaces, hackathons, entrepreneurial initiatives, and neoliberal "reforms" were seldom differentiated by politicians. By immersing themselves in the code that underlies the technologies that promise developmentalist change, I show how fundamental coding principles become good to think with, alongside the institutions and systems responsible for reinstating unequal opportunities, iteration after iteration. Hacker-entrepreneurs used their code work to develop heuristics for analyzing the organization of entities and relationship between them, whether they were elements in a coding environment or actors in a political-economic environment. [*technology, knowledge economy, youth, computing, precarity*]

RESUMEN Este artículo explora cómo los jóvenes se posicionan en relación a las promesas de la tecnología y el progreso durante un tiempo de transición política en México. Mi trabajo de campo tomó lugar entre 2013 y 2017, justo antes de que un partido político de izquierda recientemente formado ganara el poder después de un siglo de gobierno del partido "revolucionario" de México. Para la autoidentificada juventud "desencantada" en México, escéptica de las promesas de movilidad social por medio de la educación formal, el "hackear" surgió como una forma de encontrarle sentido a sus futuros en un estado y economía precarios y como una manera de dejar su "trabajo de codificación" intervenir en narrativas que sólo habían entregado esperanzas falsas. Espacios de trabajo colaborativo, hackatons, iniciativas empresariales, y "reformas' neoliberales rara vez fueron diferenciados por políticos. Al sumergirse en el código que subyace en las tecnologías que prometen un cambio desarrollista, muestro cómo principios de codificación llegar a ser buenos para pensar, junto con las instituciones y sistemas responsables de restablecer oportunidades desiguales, iteración tras iteración. Los empresarios-hackers usaron su trabajo de codificación para desarrollar la heurística para analizar la organización de entidades y la relación entre ellas, ya fueran ellas elementos en un ambiente de codificación o actores en un ambiente político-económico. [*tecnología, economía del conocimiento, juventud, computación, precariedad*]

THE FIRST HACK OF THE DAY

Dozens of young tech enthusiasts wait in line to be allowed admission to the 2015 "Hack CDMX" event in Mexico City (Figure 1). Like other hackathons, this event proposes that participants show up, network, build a multidisciplinary team, and create a technological solution to a pressing societal problem. The winners receive cash prizes and a promise from the city government to provide institutional support for the project to be successfully implemented. The event is sponsored by over thirty government entities; if the heavy government involvement is somehow lost on any of the participants, they are promptly reminded when a caravan of black Chevy Suburbans pulls up to the building. Several square-shaped men wearing suits, dark sunglasses, and earpieces jump out of one of the vehicles and form a pocket around a slimmer man with a nicer suit as they approach the entrance. "Con esos lentes no pueden ver que hay una cola" (With those glasses, they can't see there's a line),[1] one young man exclaims. "Quién es?" (Who is he?) I ask. "No sé y no me importa" (I don't know and I don't care), he responds.

[FIGURES 1 AND 2 ABOUT HERE]

Waiting in line, a couple of young men spot an obscure door with a sign that reads, "Tocar en la siguiente puerta -> o la cortina de la vuelta" (Knock on the next door -> or the curtain around the corner). One of them quickly gets out a marker and makes two small modifications to change "cortina" (curtain) to "cantina" (bar). "There it is, the first hack of the day" (Ahí está, el primer hack del día), he announces to an approving crowd (Figure 2).

The attitudes and positions expressed in these brief interactions define much of the spirit and tone that will make up the weekend event. That is, these young people exhibit a sensibility for modifying, tweaking, and finding ways to exploit vulnerabilities in systems and structures, from the

text on the sign to the practices of corrupt police officers. They embody and perform an ethos of "hacking" everything. In forty-eight hours—the time displayed as a countdown on a giant screen overlooking the space—enthusiastic programmers, entrepreneurs, designers, and community members will have to pitch their idea to over one thousand participants in attendance.

Waiting in line with me is Chavita,[2] the top scorer in a software programming placement exam we administered as part of a summer-long tech start-up boot camp at the Universidad Nacional Autónoma de México (UNAM) in 2013, where I served as technical instructor. In addition to hacking away on his computer engineering coursework at the university, he heads the university mobile development team, and during his free time Chavita performs the duties of "sensei" at Dev.f., a hacker school where young people gather to improve their programming skills, work collaboratively on projects, and promote the "hacker" ethos. At Hack CDMX, Chavita will continue to work in this spirit as he teams up with other members of Dev.f. to develop Bikingos, an augmented-reality game that allows users to gamify their experiences using Ecobicis (Mexico City's urban public bicycle transport program).

Last year, Chavita's app, Audivio, won second prize in this competition. It used a crowdsourcing platform to help find missing persons in the city. Despite the city's promise to help fund and support the project, nothing materialized from Audivio other than a congratulatory letter signed by a city official and some winning pictures and press. The hackers know that In/fracción, EseTaxi, and ¡Aguas Güey! (other projects that will be developed at Hack CDMX) are likely doomed to the same fate. This isn't particular to this hackathon, or even to Mexico. Lilly Irani (2015) chronicles a similar experience at a Delhi hackathon: years go by without her demo spawning any projects, grants, or working systems, even though a team of talented professionals spent a grueling week developing software to create a sophisticated working demo. As Irani mentions, many hackathons have similar endings, where participants "just shake hands and say goodbye" and where much of what gets built "never gets built at all" (804).

Chavita, as well as other hackathon participants, are well aware of these dynamics of making and not making. I asked Chavita why he showed up again this year to the hackathon, in the face of the same empty promises, but he responded with a reserved shrug. The underlying reasons why Chavita and other self-identified hackers continue to show up and help stage and perform the hackathon, in a setting where the promises of rewards and opportunities are largely spectacle, is one of the primary probes that guides this article.

This article has three main sections. First, I provide the political context in which hackathons and coworking spaces have been promoted by the Mexican government. To further explore the tension between the state-constructed hacker and the hacker who constructs their intervention,[3] I delve into the social dynamics and software development practices within hackathon spaces. By focusing on the heterogeneous group of research participants that gravitate toward the code, I highlight how hacker-entrepreneurs navigate seemingly contradictory spaces and subject positions to understand their current socio-political configurations. The last sections dive into the code work itself; I argue that the underlying design principles of the code provide heuristics for analyzing the organization of entities and relationships between them, whether they are elements in a coding environment or actors in a political-economic environment.

I draw on data from interviews and participant observation I conducted between 2013 and 2017 in Mexico and the San Francisco Bay Area. In Mexico, I attended over twenty hackathons and spent time in coworking spaces and at tech industry events. I conducted over fifty open-ended formal and informal interviews with hacker-entrepreneurs in Mexico City and Xalapa. Although the sites I investigate in this article are situated in Mexico, my ethnography is transnational in that I traveled frequently between Mexico and the San Francisco Bay Area, sometimes accompanied by my research participants, and sometimes running into them at various tech-related events and spaces. Thus, I continued to conduct participant observation and interviews across these sites.

By choosing the hackathon as a research site, I build on work by scholars who have analyzed the event as a microcosm of Silicon Valley dynamics, where participants perform mercurial allegiances and work in focused, high-innovation cycles meant to mimic free-market business processes (Jones, Semel, and Le 2015). At my research sites, young hackers and entrepreneurs (usually between the ages of twenty and thirty-five) learn start-up methodologies, brainstorm and prototype their products, and develop "pitches" that they use to present their start-up ideas at the ritual event of the hackathon.

I use the term "hacker" to refer to someone who loves to program computers in the spirit of playfulness and exploration and who practices computer coding; my focus is on hackers who have the technical skills to do the coding.[4] Of course, not everybody fits into this "hacker" identity and category so neatly, which is why I use the term "hacker-entrepreneur" to show how many research participants navigate domains that seem contradictory: a hacker world aimed against capitalism and an entrepreneur world that advances capitalist practices. Thus, instead of presenting simplified versions of coders/hackers as either duped neoliberal subjects or empowered coding heroes, I explore ethnographically how young people in Mexico navigate processes of self-making and being made in relation to hacking. How do they fill coworking spaces and hackathons with meaning, hope, and critique?

Recent scholarship has looked away from the Euro-American hacker lifeworlds and focused on hacker communities in the Global South (Chan 2013; Takhteyev 2012). My goal is to add nuance to an undifferentiated "global" hacker community at the same time that I add complexity to the *Mexican* hacker and, more importantly, investigate how the shifting meanings of hacking are a sign of significant technical and political change (Coleman and Kelty 2017). By putting in the code work alongside a heterogenous and shifting group of coders within and outside of the hackathon, across different hackerspaces, and by spending time with them in their daily lives, my ethnography highlights the ways young people position themselves in relation to nation-building projects and to narratives that promote the promise of technology and infrastructures (Anand, Gupta, and Appel

2018; Shankar 2008). The *code work* refers to both the ways research participants use the logics underlying coding and design principles as they develop software systems and how these logics become "good to think with," about the institutions and systems that function as elements in state-driven infrastructures that spatialize unequal opportunities.

By exploring my research participants' multiple, overlapping, and contradictory relationships to the hacker cultural worlds, I aim to highlight critiques that emerge about neoliberal work life from these "other" hackers or code workers (Amrute 2016). This article shifts attention away from the results of making/hacking in order to de-center the idea of a unified hacker movement; it works to demonstrate how hacking functions as a mode of intervening in and positioning oneself in relation to existing economic and political structures (Ames et al. 2018). Hackers in Mexico shuttle between the different layers of abstraction that make up "the code," as they build technical systems using underlying software and design principles. They immerse themselves in these *code worlds*, navigating the politics of making and not making at the same time that they reinterpret coding logics such as "loose coupling" and fundamental software concepts such as "batches" and "exceptions" to think about the ways they might reconfigure their relationships with state and economic entities who produce value from their hacking.

As each iteration of hacker-entrepreneurs pushes forward their hopes and desires, they re-mediate pessimism and guarded optimism alongside each "new" version of modernity staged by corresponding political parties. Guided by their intimate knowledge of Mexican institutions, the hackers use coding logic to provide a foundation for honing their ability to manage themselves and their practices in order to scrutinize their relationships with the state, private companies, and their valued hacker communities. By focusing on the code work of a younger generation in Mexico as they negotiate their new subject positions and conditions, I explore the mindsets, attitudes, and strategies cultivated during the "making," regardless of whether the apps and systems being made are ever actually made at all.

MEXICAN HACKERS AS MODEL ENTREPRENEURIAL SUBJECTS?

During the early to mid-2010s in Mexico, the tech start-up scene surfaced in parallel to hype from economic analysts who projected that Mexico was set to emerge as the "Aztec Tiger" economy. Popular media outlets announced that Mexico was undergoing rapid economic growth that would lead to an increase in standard of living. My research overlapped with Enrique Peña Nieto's presidential tenure. During this time, his administration's "reforms" followed a developmentalist logic aimed to move Mexico beyond low-wage factory jobs and toward an entrepreneurial economy. Popular discourse claimed that Mexico was producing graduates in engineering and technology at rates that challenged its international rivals, including its main trade partner, the United States. University enrollment had tripled in thirty years to almost three million students who were eager to join Mexico's growing middle class. Thus, analysts concluded that while Mexico was becoming a top producer of raw engineering "talent," it lagged far behind in basic measures of "innovation," such as number of patents secured, scientific papers published, and research and development investments made (Booth 2012).

Following these capitalistic and developmentalist narratives, Hack CDMX and other hackathons and coworking spaces fit into the larger Mexican political-economic landscape as spaces to keep these recent graduates busy, as potential generators of companies that would create jobs for them and their colleagues, and as the type of infrastructure that could help Mexico emerge on the global innovation stage. The tech-entrepreneurship movement in Mexico indexed the government's interest in rapid economic development defined by technical expertise and information technologies. Not surprisingly, state government offices could be found on the first floor of iLab, one of the coworking spaces where I conducted research in Xalapa, as politicians frequently dropped by to hear the latest start-up pitches and take pictures with the teams.

The young entrepreneurs by no means ignored the political backing and presence. "Chung," a self-identified hacker from Xalapa, comments on the upcoming hackathon being sponsored by the city government:

> Don't ask how I got a draft of the call for the "Xalapa Hackathon," but if you want to participate you can start getting read. We have to develop technological solutions to resolve mobility problems and municipal services . . . according to this [announcement], whether you win or not you have to submit your project, code and documentation, and well the prize is that you will appear in Xalapa's newspaper, you get a scholarship to iLab, and you will get a pat on the back from the municipal president . . . very tempting, right?[5]

Especially regarding hackathons, hackers across my research sites agreed that government entities were using them as a way to further their own political agendas and as photoshoot opportunities for their poster politicians.

The use of technology by state entities to advance underlying political agendas is not new and has been theorized in other contexts. "Techno-politics" (Joyce 2003; Mitchell 2002) refers to a mode of politics that functions through invisibility. Grounded in liberalism, governmental bodies seemingly leave citizens be, to go about their everyday affairs without intervening. Instead, governments seek proxies in technological regimes—building sewers and other infrastructure, such as networks and phone lines, and conducting censuses—which are seen as technical and outside of political processes. Achille Mbembe (2001) writes about the simulacral language that was part of an aesthetics of power in African postcolonial dictatorships. The simulacral language was used by the state and accepted by citizens but it was devoid of referential meaning. This system worked not because it generated legitimacy but because it provided specific events that dramatized state power and therefore reinforced it. Brian Larkin (2008) found a similar pattern in Nigeria: technology is used as part of political rule, and state-sponsored projects—roads, bridges, radio, any "new" technologies—are linked to events, to spectacular rituals that are meant to produce particular affective responses. Not only are state officials always present in the mediated representations of these projects, before and

after they are built (and even if they never are!), but the repetition of this pageantry in films and across different media is meant to produce, address, and train a modern subject on how to react to these awe-inspiring projects.

Likewise, the construction of the coworking spaces across Mexico worked to perform the potential of technological infrastructures to fulfill the promise of progress. If there were government offices on the bottom floor of iLab, and state representatives frequently visited to take pictures with the hackers diligently working above, it was because they wanted to be close to the modern, global subjects. These code workers were confirming Mexico's "coming of age" while governments across Latin America raced to move their nations away from categorization as "developing countries" (Dávila 2016). More importantly, the celebration of *entrepreneurial* hackers working within these spaces helped to promote a political agenda where young people were asked to appropriate neoliberal discourses about taking initiative, being self-satisfied, not waiting for government, and being "socially conscious."

The model entrepreneurial hacker emerged as a valuable subject in the Mexican political-economic landscape, where the majority of young people were disconnected from institutional support. That is, only a minority of young people in Mexico were connected to institutional circuits that allowed them to make decisions about their livelihoods regarding their health, work, education, and security (Reguillo 2010; Urteaga Castro Pozo 2011; Valdez 2009). A 2010 study showed about seven million young people aged fourteen to twenty-nine in Mexico were either looking for employment, not enrolled in school, or fell under the broad category of "not economically active" (Instituto Mexicano de la Juventud 2010). This label is accompanied by a more colloquial term, *ninis*, short for *ni estudian, ni trabajan* (don't study, don't work), often used to refer negatively to young people who have become a burden to the society or economy.

This labeling has its counterparts in other parts of the world. Amit Vered and Noel Dyck (2012) highlight the bureaucratic category of NEET (not in employment, education, or training) used

to describe young Brits. The authors point to a specific category of youth all over the world who have been affected by economic restructuring. These young people are just as likely to be framed as agents of social change and progress as they are to index social breakdown and a "problem" in society. Young people in Mexico, particularly those from working-class backgrounds, express skepticism that university degrees will lead to gainful employment (Howell 2017). In interviews with youth in Mexico and Spain, researchers found that there was widespread identification with a "generation of disenchantment," as when research participants stated, "They fooled us, we did what they told us and in the end things aren't the way they told us they would be" (García Canclini and Cruces 2012, xviii).

In many ways, Chung's cynicism about the government backing for the hackathon mirrored the comments from other "disenchanted" youth across the world that other scholars have pointed to and, more generally, the expressions of loss of hope for the future and loss of faith in the neoliberal project that other anthropologists have found in contemporary contexts (Riles 2013). Reviewing recent anthropological theory, Lucia Cantero (2017) finds that ethnographic explorations have consistently unpacked a persistent disenchantment with the fruits of contemporary political economy.

Indeed, "disenchanted youth" proved important to the history of politics in Mexico. They were central to the election of left-leaning Andrés Manuel López Obrador in 2018 (Villegas 2018). Running under the banner of the newly minted party Movimiento de Regeneración Nacional (MORENA), López Obrador won the most votes at the presidential level in Mexican history, an incredible thirty points more than his closest contender, and triumphed in thirty-one out of thirty-two of states and in 80 percent of the country's municipalities. López Obrador's political discourse seldom had to give specific names or give detail of his plans for change. An anti-establishment stance against the *mafia del poder* (mafia with power) and critique of the "system" was enough to enamor young voters who held skeptical hopes for something new. Surprisingly, López Obrador's victory and promise of renewal came with familiar faces. That is, old adversaries had now become MORENA

members, and López Obrador accepted everyone willing to join the party, with little gatekeeping (Ackerman 2018).[6]

Larissa Adler Lomnitz, Claudio Lomnitz Adler, and Ilya Adler (1990) highlight how presidential campaigns in Mexico are carried out as political rituals in order to continue the same structure and organization under the guise of different campaigns. Even before the parties' presidential candidates are chosen, there is tactical maneuvering and strategizing between *hombres del presidente* (men of the president) and *hombres del sistema* (men of the system).[7] The distinction between these two groups is one that reveals which subjects will emerge as the "politicians" (those who will maintain close relationships to the future president) and which will emerge as the "technicians" (those who will assure the system continues).

Campaigning events are part of this political performance, for example, where organizers demonstrate how efficiently they can execute a flawless event; it's their opportunity to demonstrate to the presidential candidate and party how much they belong in the privileged "political class" made up of the "men of the president" and "men of the system." These stagings have another important purpose: they frame the "problems" that need to be resolved and stage the corresponding "dialogues" with special interest groups. We thus see the emergence of "women," "Indigenous people," "youth," and their projected prominence within these events indexes the extent to which the campaign will align these groups with the "problem" to solve.

Thus, from Peña Nieto to López Obrador, "disenchanted youth" from all walks of life, especially those who were "not economically active," or *ninis*, were constructed as a problem to be solved by corresponding campaigns. "Technology for young people" is a pitch that translates across borders, including those that divide politicians and political campaigns. As "hacker-entrepreneurs," these young people were constructed as subjects who could themselves solve their problems, and the code would be a key element for them to do so. State-sponsored hackathons and hackerspaces have endured from Peña Nieto to López Obrador, as "men of the system" and "men of the president"

reorganize themselves and their projects. Within these spaces, young people were charged with demonstrating they could become the modern affluent knowledge workers of tomorrow.

But not all hacker-entrepreneurs in Mexico were necessarily driven by a naive interest in exhibiting the entrepreneurial spirit to perform middle-classness, to confirm their trust in their ability to build the nation and "change the world." I found a surprisingly heterogeneous cast of characters, motivations, and experiences at hackathons during a period of transition, or "disenchantment," in Mexico. Like the diverse set of constituents responsible for electing López Obrador, those who gravitated toward the code came from distinct social and class positions. To explore further why Chung and Chavita, like many of the other coders at the Mexico City event, continued to hack away amid "politics as usual," which sometimes meant unreliable government sponsorships, shameless politicians, and empty promises, I participated as a team member and floating mentor across hacker events and spaces in order to stay close to their practices, hacking while I hovered above their hacking, within and beyond the hackathon.

STAGING THE HACKATHON

If the Mexican state is invested materially and imaginatively in the hackathon, so are the participants who come to put in the code work to attempt to make their solutions and dreams come alive. The technical solutions proposed at this hackathon are closely guided by intimate understandings of the kind of apps that will win the event, that the "winning" might not lead to tangible solutions, and that there is real meaning in the process of "making" regardless of the outcome. Among the cast of characters at Hack CDMX is Hugo, a veteran coder and recent UNAM computer science graduate who travels over two hours on public transportation in and out of Mexico City from a peripheral *municipio* to participate in these events. Most of his earnings he contributes to help pay for family

expenses, and he saves up just enough to purchase airplane tickets to attend annual expo training events in the San Francisco Bay Area hosted by major tech companies. Wearing T-shirts given away by these companies is a badge of honor for the hacker, and they complement his wardrobe of more colorful T-shirts with even more colorful slogans: "Talk is Cheap," "Show me the Code," and Hugo's favorite, "Programming is the closest thing we have to superpowers."

iLab's director is nicknamed El Pato (The Duck), in response to his characteristic phrase, "Yo escopeta, tu pato" (I'm the shotgun, you're the duck), which is meant to index an overall disciplining of the rising hacker-entrepreneurs who join iLab. El Pato's bible is *The Lean Startup*, a popular book that circulates widely in the start-up world and proposes a decentralized protocol for efficiently developing tech products that meet the needs of early customers, thereby reducing market risks and sidestepping large amounts of initial project funding. In an interview, El Pato tells me:

> Lean means slim, but it also means we are always in beta. Nothing is certain. All the time we are reformulating everything. If we see something is not being applied correctly we calibrate it. If we see there is a process being applied successfully in another location, in that moment we adopt it and connect it to ours. We don't want to do something static, we want to continue being very dynamic.

When he makes appearances at events like the hackathon, he supervises iLabbers to make sure they are adhering to the disciplined entrepreneurship the model proposes.

Hugo and El Pato seem to lie on opposite poles of the hacker-entrepreneur spectrum. One was educated at UNAM, Mexico's top public university; the other was educated at the elite private Tec de Monterrey. One sports the disheveled hacker appearance, complete with T-shirt and hoodie; the other prefers the sports-coat-and-jeans look characteristic of a Silicon Valley investor. One religiously immerses himself in the code, with a vast knowledge of the libraries and functions that make up each coding language; the other splits his time between learning to code and learning the start-up language of the entrepreneur. The playful nicknames and mocking serve to establish their distinct socioeconomic positions and differing roles within organizations such as the coworking space, but the

fact is that Hugo and El Pato end up occupying the same spaces, even if these appear to be at odds with one another in terms of politics or broadly defined cultural practices.

Indeed, the ability with which different hacker-entrepreneurs also maneuvered between seemingly contradictory spaces was quite revealing during my research. Early in my fieldwork, I visited distinct hackerspaces to get a feel for the differing political alignments and ideologies across hacker communities. One collective, for example, more closely aligned with the images of hackerspaces a general public might have: undisclosed location, DIY workshops using open-source technologies, an alignment with radical leftist politics evidenced not only by discourse but also by Zapatista posters, and a collective community disdain for any potential member that pulled out an iPhone. This collective contrasted sharply with some of the corporate-sponsored hackathon spaces and events, complete with company-sponsored infrastructures to support software development (and sometimes gourmet catering), a reverence for Silicon Valley figures and discourses, and participants who compared specs of their latest smartphones. To my surprise, I wasn't the only diligent "ethnographer" navigating these seemingly contradictory communities; across these spaces, I frequently ran into my research participants, who plugged into and out of each collective with ease.

In the same way that "hacking" allowed event attendees to carry the ethos of the CDMX hackathon onto the streets (quite literally) in the opening vignette, the loose definitions of the term allowed Hugo, El Pato, and others to come together across markers of difference within spaces that practiced distinct versions of hacking. In this sense, "hacking" functions as what Henrietta Moore (2004) calls concept-metaphors, whose meanings are necessarily underspecified to allow people (including anthropologists) to understand processes within specific economic and political contexts. The purpose of these concepts is to maintain ambiguity in order to frame different levels or domains that facilitate comparison between contexts and open new spaces for future thinking. By traversing the different spaces that made up the hacker worlds, research participants worked on making the

connections, comparisons, and contrasts that made up the communities that formed a specific cultural and political-economic landscape.

Membership in these hacker communities calls for the oscillation between craft and craftiness—the pursuit of quality and excellence as well as some degree of agility and guile (Coleman 2017). Thus, as my research participants honed their technical craft, the underlying code work provided them the metaphors and tools to conduct this type of "ethnography," even if they never called it that. For hacker-entrepreneurs who spent a lot of time building systems, "hacking" provided a broad referent for navigating institutions, and the code work gave them the conceptual tool kit to carry out this social analysis and critique of other "systems." A closer look at this code work across my research spaces in Mexico reveals how the underlying logics of software design provided heuristics for analyzing their precarious political and economic relationships.

CODE WORK: BATCHES AND EXCEPTIONS

At Hack CDMX, Hugo, El Pato, and Chavita spend the weekend together thinking up solutions to Mexico's problems at the same time that they meet and work with other coders, designers, entrepreneurs, and curious onlookers from across the country and from across the world—participants that have shown up to take part in the spectacle of the hackathon. Hackers have gathered not only to create something new but to share, in person, their latest creations; they show off their code to others who can appreciate it. "Mira todos estos imports" (Look at all these import files), Chavita tells Hugo, as he points to the dozens of "import" statements in his Python file. An import statement tells the current file to look at other files that contain previously written code that you can reuse for the task at hand. "No tengo más de cuarenta lineas en cada class" (I don't have more than forty lines in each class), Chavita proudly explains. Hugo, who hasn't slept in the last thirty hours, manages to follow

Chavita's demonstration with his bloodshot eyes, and confirms Chavita's accomplishments with an enthusiastic "Eres un chingón" (You're a badass).

Indeed, the principles of reuse, simplicity, consistency, efficiency, and the ability to shuttle between different levels of abstraction are core tenets of computer science and the metrics used to identify a talented computer programmer. Hackers at Hack CDMX use the time and space to share code from other projects they have been working on, sometimes from their professional jobs where there are few programmers and where results-oriented managers fail to recognize the complexity and beauty of their creations. In her ethnography with hackers, Gabriella Coleman (2013) finds their values of cleverness, ingenuity, and wit transfer to the process of making technology and writing smart pieces of code. That is, hackers "revel in directing their faculty for critical thought toward creating better technology or more sublime, beautiful code" (118). If one can dissect, manipulate, reassemble, and solve the problem within the given constraints and tools at hand, one can create beautiful, "original" code.

[FIGURE 3 ABOUT HERE]

While some newcomers learn the ways of the code worlds at the hackathon, others have carved out more permanent spaces to carefully cultivate their code work, along with the corresponding attitudes and values. "We loved to go to hackathons so we made one that would extend more in time. We wanted to live the hackathon every day," Kike tells me. He is one of the founders of Dev.f., the first "hacker school" in Latin America, created in 2014. As students at the hacker school progress from white-belt (most basic) to black-belt (most advanced) classes, their "senseis" (Chavita among them) provide feedback and mentorship into the hacker ways. Their vision for how hackers fit into the overall political-economic landscape is succinctly stated on their T-shirts: "México necesita más hackers" (Mexico needs more hackers) (Figure 3). One of first entries on the school's popular blog lays out the ten principles of the "hacker ethic" one must follow to become a Dev.f. hacker:

1. *Give before you get*

2. No pedir permiso (Don't ask for permission.)

3. Hacer > Hablar (Doing > Speaking)

4. No existen excusas (Excuses don't exist)

5. Resolver problemas (Resolve problems)

6. Sigue tu curiosidad (Follow your curiosity)

6.2 Fracasar == Crecer (Failing == Growing)

7 Conoce tus herramientas y comunidades (Know your tools and communities)

8 Siempre aprender (Always learn)

9 Involucrarse (Get involved)

10. Divertirse en el proceso (Have fun in the process)

The "hacker culture" thus becomes a product to be sold to hackers-in-the-making by expert coders. The language used in the hacker ethic clearly aligns with neoliberal language that calls for young people to take matters into their own hands, as discussed in the previous section. For example, "hacer > hablar" (doing > speaking), rule number three, and "no existen excusas" (excuses don't exist), rule number four, call for productive, noncomplaining citizens.

Hugo, who holds a stronger conviction about what the hacker should or should not be, has other problems with the hacker school. "Their website even looks like the template all the start-ups use. What's the difference?" he asked. Hugo does not agree with the "real" hacker ethos being compromised. He's expressing one of the fundamental tensions I heard hacker-entrepreneurs debate: the anticorporate hacker ethos versus the embeddedness and dependence of hackers on tech companies. The hacker school sells the hacker package to not only hackers-in-the-making but also the tech companies who want to integrate talented software developers and also feel they are part of something young and new.

Kike tells me more about how the school helps burgeoning hackers connect with potential employers. Since the school is nomadic, he tells me, each batch of students takes part in the twelve-week program in a different part of Mexico City, many times holding their trainings and related events within coworking spaces. However, they also hold some trainings and events within tech companies and government offices. When they work within one of these facilities, they are not involved in the operations of the organizational entity, but they do promote hacker students for advertised jobs within the company or government office. The idea is that a few participants might transition into professional roles within the organization that do not compromise the hacker ethic the Dev.f. program has so carefully cultivated. "If there's no match, the hacker comes back to next batch and we try again. It's like catching an exception," Kike tells me.

The metaphors that participants at Dev.f. used to describe their practices were fundamental to their code work. A batch, for example, is simply a group of items. The term can also be used to refer to a set of instructions or processes that run before or after a user interacts with the computer, as in "batch processing" or a "batch job." In the case of Dev.f., each batch of students developed their coding skills and hacker persona before they were presented to the potential "user"—in this case, a company that would potentially find the coding skills of the hacker to be of value to their business. If there was no "match," as Kike described, or if during the time that Dev.f. worked within the organization's space they deemed that their coding skills would not be truly valued, or that the entity might compromise their hacker ethics, then they would try again—in computing terms, they would "catch the exception." An exception occurs when there is an anomaly or unusual occurrence during the normal flow of execution of a computer program. A defensive programmer plans for these exceptions, thinking about anything that can go wrong during the execution of a program, and prepares special cases within the code to handle the exceptions. As each of their batches progresses through the hacker program and the school organizes events within tech companies or state-sponsored spaces, they interview workers to get a feel for the workplace dynamics (e.g., retention rates, coder satisfaction, nepotism) and the political moves within. Instead of simply responding to job postings

and allowing companies to exploit their coding skills, Dev.f. envisions that their careful analyses of the inner workings of the company will allow them to create an overall better system.

The time spent within the hacker school thus serves to resolve one of the fundamental predicaments that many of the young university students and graduates must work to resolve in relation to their studies and their labor. On the one hand, they could be unemployed or participate in intermittent or poorly remunerated employment; on the other hand, they could continue to wait until the ideal job comes along. Julie Archambault (2017) shows how graduates in Mozambique follow the latter route and wait it out until an acceptable job comes along. These youths are criticized by older citizens for their sense of entitlement, for preferring to go hungry instead of taking menial jobs; young people come to expect social mobility after years of studies (Archambault 2017, 79). Unemployed graduates in India similarly linger in a state of educated stasis, acknowledging that further studies might make them "overeducated," which might further increase their unemployability (Jeffrey 2010, 472).

While young people in Mexico also express ambivalence toward education (and overeducation), the hackerspaces give them the space to rethink their situation and plan their course of action. If "the state" inserts itself on the bottom floor of iLab to monitor the work of the hacker-entrepreneurs and use them as models for photo opportunities that promote the "promise of technology," as my research participants claimed, then the hacker school uses the coding metaphors to reverse the relationship. That is, the hackers attach themselves to entities to get a feel for the institution, to "interview" them while the hackers analyze if it's an institution they want to be committed to. Their work within these spaces might effectively help them dodge the problematic categorization of *ninis*; they inevitably perform for various publics the role of knowledge workers enthusiastically connected to their computers. But the real work, the code work, falls under the radar.

This code work effectively connects the code worlds to other social and cultural worlds my research participants inhabit. But it's not that "the code" is bounded from these other domains. Nick

Seaver (2018) shows how teams of software developers organize themselves according to principles that govern the code they write; coders build small, semiautonomous, readily configurable groups. In the same way Seaver pushes us to think about algorithms as complex socio-technical objects instead of autonomous technical objects that can come to "rule" human culture, we can move from thinking about code as a purely technical object and thinking about the code worlds as socio-technical fabric. My focus on the code work highlights precisely how this fabric is woven (or coded). The way analogies are drawn together between different domains is what anthropologists have referred to as "culture" (Strathern 1992, 33). If scientists and engineers program their (many times Eurocentric and heteronormative) worldviews into computer programs (Helmreich 1998), here they use the very logics with which these programs are constructed as transformative openings that have the potential to make different worlds possible. For hacker-entrepreneurs in Mexico, fraught relationships with political and economic entities might be the reality of their existence, but batches and exceptions provide the metaphors and (hopefully) tools to think of these entities as elements in the current configuration, and to realign their own practices accordingly. The code work allows them to think and act alongside "the system."

CODE WORK: LOOSE COUPLING

With one hour left in the hackathon, the Bikingos team takes a needed break for some noncoding *cotorreo* (fooling around, just hanging). I take advantage to conduct informal interviews with the team. Hugo tells me more about why he is so tired. Hugo works for a tech consulting firm in Mexico City and usually spends ten to twelve hours a day programming, and he often has to work weekends with no extra pay since he gets paid by the project. His best friend Memo, who comes from a similar socioeconomic background, recently landed a job doing back-end coding for a major bank in Mexico.

Memo now has a guaranteed salary perhaps worthy of his UNAM degree; the 17,000 monthly pesos (about US$850) solidify his position as a lower-middle-class citizen who no longer has to worry about making ends meet. His family is definitely proud of him. Hugo, on the other hand, isn't impressed. Although Hugo lacks job security and makes less money working on projects for the consulting firm, he claims he'd rather work on the more challenging projects the firm hands him and that, even if the work was similar, they couldn't pay him enough to wear a suit and join the *godinez* (office workers) at the bank. He is aware of the precarity of his situation, but instead of framing it negatively, he refers to his work arrangement as "loose coupling."

Loose coupling is a computing term that refers to a robust way to write code where data structures (or other components) can use other components in an interconnected system without needing to know the full details of their implementation. In this way, each component becomes more autonomous and can be used for different purposes by different components; elements become "coupled" and depend on each other with very little (or no) direct knowledge of each other. Hugo goes on to recommend manuals and tutorials that further explain this software design so that I can appreciate its value. The term "loose coupling" Hugo uses to refer to his flexible work arrangement references his autonomy at the same time that it references his replaceability. Like many of the young people in attendance, Hugo contracts out his programming skills to diverse companies or start-ups. In his case, the consulting firm helps make these connections, especially with US-based companies looking for programmers who work for less than software programmers in the United States.

Hugo changes gears in our conversation and elaborates on the hackathon dynamics: "In the past, the politicians would arrive to distribute blenders and take pictures when the basket[ball] court was completed, if it was ever completed. Now, they arrive to distribute hackathon stickers and take pictures with the winning teams" (Antes, los políticos llegaban a repartir licuadoras y a tomarse la foto cuando se terminaba una cancha de basquet, si es que se terminaba. Ahora llegan a repartir stickers del hackathon y a tomarse la foto con los equipos ganadores). The stickers Hugo refers to are

primarily used as marketing material: they show the logos of tech companies, operating systems, development tools, and hackathon events, and participants like to decorate their laptops with them, creating colorful, creative displays. Even though Hugo criticized the practice of sticker distribution, associating it with the "old" method of gifting household electronic appliances such as blenders in the name of voter recruitment by politicians, he still proudly displays his stickers on his laptop. Moreover, the varied events, companies, and technological platforms show the contradictory and fleeting allegiances that currently make up his hackerworld. Like the "loose coupling" approach he takes to code, his sticker arrangement points to his flexible (and legible) networking capabilities.

Hugo talks about the politicians (as representatives of the state) in the same way as companies, both as elements that can be represented visually and reconfigured on his computer. Instead of thinking of these sticker arrangements as pointing to the contradictory collectives to which the hacker-entrepreneurs belong, we can think of these shifting compositions as a canvas where (fleeting) relationships are made explicit and negotiated. "Loose coupling" gives him a way to think through these relationships. In the same way, the hackathon serves as a space where individuals negotiate not only their belonging to communities but their position within broader political and economic processes. Similar to the way Hugo voiced his hesitancy with the hacker school "selling out" by adopting start-up cultural forms, my research participants used the hackathon as a space to debate common points of contention: the desire of being associated with Silicon Valley infrastructures versus the reality of being exploited by them; the focus of autonomy and DIY central to the hacker ethos versus the promise of state care; the aspirations of hackers to benefit from their involvement with tech companies versus the practice of being exploited by them.

These shifting relationships and negotiations also point to the neoliberal knowledge economy and underlying processes of transnational capitalism that ask young people to work by the project, and on their own time. Rising hacker-entrepreneurs must learn to respond quickly and with agility to volatile market trajectories and frequently cross career, role, and political boundaries to perform their

flexible or "latitudinal citizenship" (Ong 1999). Market volatility becomes a way of life, where flexibility, instability, liquidity, and risk-taking are interpreted as desirable and challenges that the modern subject can manage by employing calculative decision-making (Ho 2009; Miyazaki 2003; Zaloom 2003).

But unlike other entrepreneurs who embody the rhythms of neoliberal life (in Mexico or beyond), Hugo and other hacker-entrepreneurs stay close to the code. Concepts such as "loose coupling" serve to make sense of the shifting relationships, even when these relationships are with the institutions that promise to help them navigate these relationships (e.g., the hacker school). Their lived reality calls for young people to be flexible, but not too flexible, autonomous, but not too autonomous. As Ilana Gershon (2018) reminds us in her study with Silicon Valley job seekers and job hoppers, enacting a neoliberal self is tricky. Workers come to see themselves as projects who must steer through various possible obstacles and alliances, moment after moment, with each instance creating a possible contradictory dilemma (175). Neoliberal workers develop different strategies across different national and cultural contexts for "making do" in precarious labor markets. Young people in South Korea, for example, learn to "think with play" when they immerse themselves in the digital gaming worlds and develop dispositions for thinking and acting in quickly shifting, unsettled circumstances; strategies for "productive slowness" allow gamers to take ownership over their time and activities in irregular labor arrangements (Rea 2018, 509). In Mexico, my research participants might not necessarily "escape" neoliberal work conditions, but the code work allows them to slow things down, to take momentary snapshots of the way their economic and political connections are drawn together. The code work offers heuristics that might lead to transformative openings in volatile conditions as well as metaphors that provide the promise of autonomy as young people assume their positions as "neoliberal workers."

For forty-eight hours, then, Bikingos team members put in the code work as they design a beautiful graphical interface and user experience for their application and test their app while riding

bikes around the city. After several iterations of prototyping, testing, and debugging, they commit their final code snippets to the team's repository, click "deploy," and celebrate the successful launch of their working application (Figure 4). They deliver a phenomenal pitch to the hundreds who show up for the final demo session and celebration. Bikingos wins first prize in the "solutions for the city" category. The team poses proudly for their group photograph. Chavita gets the same certificate he did last year. In the individual photo sessions, a different politician than last year takes a picture with him.

[FIGURE 4 ABOUT HERE]

This public performance of the rewards and the potential of the hackathon contrasts with the private discussion the team had as they talked about the actual utility of the app. That is, they were aware that the rating system and route-sharing infrastructure that was part of their app was not very likely to be used in daily Mexico City life; because of privacy issues, users would be reluctant to share any personal information, despite the promise of secure connections and encrypted data. Thus, hackers know that their code "works," in that their platform delivers the expected outcomes, but their final "product" might not necessarily be used by actual citizens. Whether the judges at the event realize this or not is many times beside the point. Regardless, what brings people who fall on different sides of political and institutional boundaries is the code; they're at the hackathon for the code work, not necessarily the "results."

Indeed, a fundamental feature of the "making" these code workers are involved in is the understanding that noncompletion is a legitimate outcome of their efforts. Across maker communities, the language of "prototyping" is used to reference the experimental, open-ended, and often aspirational desires for communal self-organization embedded in skill-building (Corsín Jiménez 2014). That the objects being built are less important than the people and mindsets being built directly contests the language of emancipation and "access" that often accompanies the introduction of computers, especially in "underserved" populations or "developing" countries (Ames 2019; Crooks 2018). Whether the discourse and corresponding infrastructures are introduced by foreign companies

or by the state, in this case, my research participants retreat to the lower layers of the computer—to the underlying computational principles and logics that structure the code—to help them make sense of their current situation.

Techno-politics are meant to distract citizens, to use technological proxies that appear to be outside of "politics" to continue business as usual. In Mexico, the hackathon serves as another ritual to perform modernity and the promise of technology. But the hacker-entrepreneurs construct new forms of mobility by traversing the bottom layers of these "new" technologies, where they can observe how different elements are related, how things "really work." Software's fundamental appeal is that it has the power to illuminate the unknown; its separation of software from hardware, interface from infrastructure, provides a powerful metaphor for how the system works (Chun 2013). Young people adept and constructing and navigating these technical infrastructures feel less threatened or "trapped" by them and more inspired to "recapture them and turn them to new ends in the service of new worlds" (Seaver 2019, 433). Between the code worlds and social-political worlds, the code work gives hacker-entrepreneurs the tool kit for social critique; it gives them the tools to think with the system, whether that system is the latest software infrastructure, socioeconomic program, or political reform.

CONCLUSION

When I initially asked Chavita why he continued to attend hackathons in the face of empty promises and uncertain outcomes, he responded with a reserved shrug. By following his and other hackers moves in the world of hackathons, coworking spaces, and hacker schools, I was able to see how Chavita, Hugo, El Pato, and other hackers actively participate across communities as they appropriate and embody the hacker spirit. That is, in some ways they belong to the undifferentiated "global" hacker community other scholars have conducted research with. They value cleverness and creativity

and place a high premium on knowledge, self-cultivation, and self-expression as core tenets of achieving "productive freedom" and corresponding "software freedom" (Coleman 2013). They improve their technical craft by following principles of reuse, simplicity, consistency, efficiency, manipulation, and agility.

As these hacker-entrepreneurs honed their coding skills during my research, multitudes of citizens across Mexico collectively protested the impunity, corruption, and violence that had come to characterize state practices, where *narcofosas* (drug-trade graves) with hundreds of unclaimed bodies frequently appeared in clandestine locations and where dozens of protesting students went "missing" at the hands of state officials. In a particularly dramatic and mediatized case, forty-three students were forcibly disappeared from the teacher's college, Ayotzinapa, in the state of Guerrero, on September 26, 2014. Mariana Mora (2017) argues that because these students were constructed as coming from a space of social backwardness, isolated from modernist nation-building efforts, they were treated as collateral damage; they were simply preventing the rest of the country from moving forward on a developmental scale.

Although many of my research participants came from similar socioeconomic backgrounds as the disappeared students, their activities within the hackerspaces helped them dodge a similar fate. At one level, their demonstrated activity within these spaces served to avoid their labeling as *ninis*, in that their activity might be qualified as "studying." Moreover, the genre of their studying fell under the appropriate category of respectability. That is, they weren't learning how to farm and becoming versed in transformative pedagogies, as the Ayotzinapa students were doing; the hacker-entrepreneurs were performing their roles as affluent knowledge-workers-in-training within the modern, sanitized coworking spaces. If they happened to come from marginalized backgrounds, they were demonstrating they were capable of breaking intergenerational cultural and economic "backwardness."

As I've argued here, though, my research participants appropriated the discourses of flexibility and self-management at one level, while they allowed their code work to guide them at another. When faced with the developmentalist "reforms" of neoliberal economic change, middle-class youth may respond by exploiting their advantages vis-à-vis the poor, or by building solidarities to protest the status quo. Among Mexican hacker-entrepreneurs, I found a heterogeneous cast of characters, motivations, and experiences, and who were not just driven by misguided interest in exhibiting the entrepreneurial spirit in order to perform middle-classness. I've suggested that youth from diverse socioeconomic backgrounds gravitated toward the code during a time of transition in Mexico, when a newly formed leftist political party gained power after a century of rule by a party characterized by unmet promises, a party that continuously shifted its "men of the president" and "men of the system" to give an appearance of change.

In this context, "hacking" emerged as a way for young people to make sense of their futures in a precarious state and economy, as a way to let the "code work" intervene in narratives that have only delivered false hopes, and as a way to think alongside the system responsible for reinstating unequal opportunities, iteration after iteration. Coworking spaces, hackathons, entrepreneurial initiatives, and neoliberal "reforms" are seldom differentiated by politicians. Hacker-entrepreneurs become part of the reimagining of Mexico as an orchestrated national project, entrenched in narratives that promote the promise of technology. By immersing themselves in the code worlds that underlie these technologies, they learn to design systems that promote separation of concerns and self-determination by actors. "Loose coupling," "batches," and "exceptions" provide heuristics for analyzing the organization of entities and relationship between them, whether it's an element in a coding environment or an actor in a political-economic environment. The code work offers a younger generation in Mexico the conceptual tool kit to think about political economy on the ground in the context of changing state power, shifting meanings of entrepreneurialism and capitalism, and a challenging era of political violence.

As these young people turn the spotlight less on what they say and more on what they code and the context in which they do so, they hack away, and in the background we have business as usual, politics as usual, reforms as usual. Politicians create and re-create "the state" in response to narratives that paint Mexico as "hyperconscious of its backward condition for at least 150 years" (Lomnitz 2001, xvii) or as a place where "traditions have not yet disappeared and modernity had not completely arrived" (García Canclini 1990, 13). The hackathon becomes a site where "new" versions of modernity are staged, where the state and hackers find complex ways to coproduce themselves, and where coding logic becomes foundational for the reconfiguring of these relationships. Here, the self-identified hackers find meaning in a community of action and performance that supports them as they negotiate their new subject positions and conditions within these overarching processes that construct them as always "in-the-making," as always "becoming," as always waiting. If they're going to be waiting, they might as well be waiting in line at the hackathon.

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NOTES

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1. All translations by author.
2. All names are pseudonyms.
3. An exploration of gender dynamics at hackathons is beyond the scope of this article. For an analysis of why the "tinkering" ascribed to geek (and hacker) communities continues to be a predominantly male pursuit, see Dunbar-Hester (2016).
4. Kelty (2008) uses the term "geek" to avoid subversive or criminal connotations and to be more inclusive of the lawyers and activists sympathetic toward free and open-source software (F/OSS) endeavors. I prefer the term "hacker" for those who have the technical proficiency to do the computer coding; moreover, I found this is how hackers identify in Mexico. For this same reason, and to facilitate reading flow, I use hacker and coder interchangeably.
5. Block quotes translated from Spanish.
6. This wasn't entirely surprising, as López Obrador himself started his career as part of the Partido Revolucionario Institucional (PRI, or Institutional Revolutionary Party). From 1929 to 2000, the party held power while it constructed itself around the ideals of the Mexican Revolution and reinvented itself until it became the representative of what many scholars call "institutionalized revolution." In 1929 it was formed as the Partido Nacional Revolucionario (PNR), in 1938 it was dissolved and renamed Partido de la Revolución Mexicana (PRM) and in 1949 was dissolved and renamed PRI.
7. Terms used by Larissa Adler Lomnitz, Claudio Lomnitz Adler, and Ilya Adler (1990).

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FIGURE CAPTIONS

Figure 1. *Line around the corner to enter HackCDMX. (Photograph by author)*

Figure 2. *The first "hack" of the day. (Photograph by author)*

Figure 3. *Hackers-in-the-making from Dev.f. walk down a major avenue in Mexico City. (Photograph by Katie Keliiaa)*

Figure 4. *Chavita and friends/teammates presenting Bikingo to a mentor. (Photograph by author)*