

The Role of Digital Communities in Organizing Gig Workers

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Using survey data from 450 ridehail drivers, this article examines how social networking sites (SNS) influence workers' views on union instrumentality and unionization. This article finds that more frequent interaction with other workers in online communities is associated with improved views of union instrumentality and interest in joining a ridehail drivers' association. These findings link together the fields of information sciences and industrial relations and suggest a new institutional actor in modern industrial systems, the online worker network.

Introduction

For nearly two decades, scholars have asked how the Internet will change union organizing (Bryson, Gomez, and Willman 2010; Osterman et al. 2001). Its promise is clear: The Internet eases the distribution of information and can network together people with similar ideas and interests (Freeman and Rogers 2002). Moving actions from online to offline proved difficult, and the early 2000s provided little evidence that the Web was helping organized labor reach new members or stem its losses in established strongholds (Nolan 2017). Yet in March 2018, thirty thousand public school teachers in West Virginia engaged in a statewide wildcat strike, demanding higher wages and better health-care benefits (Bidgood and Robertson 2018). The teachers' subsequent victory was a dramatic outcome for labor in an otherwise precarious national environment (Zorn 2018). After the strike, workers pointed to an unusual organizing factor: a Facebook group called "West Virginia Public Employees United" (Bidgood and Robertson 2018; O'Donovan 2018). Highlighting the importance of the Facebook group, strike supporters commented: "This strike

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wouldn't have happened without the grassroots organization through the private Facebook group ... without question, I don't think this would have reached the critical mass that was needed had they not had the platform of the group to communicate" (O'Donovan 2018).

Although the teachers' Facebook group appears to have influenced this strike, there is an ongoing debate in the academic literature about the role of digital communication in union recruitment and labor actions. The union organizing literature has long emphasized the importance of in-person contact (e.g., Bronfenbrenner 2006); consistent with this line of research, early work on digital organizing found that Internet communication could not generate a sense of labor solidarity (Heckscher and McCarthy 2014; Saundry, Stewart, and Antcliff 2012). Yet a wave of teacher, Uber driver, and Deliveroo rider strikes have led some scholars to reconsider the role of online communities in building labor solidarity. These scholars point to a new type of Internet structure, "Web 2.0" networks, as a catalyst for labor actions (Pasquier and Wood 2018; Wood and Lehdonvirta 2019; Wood, Lehdonvirta, and Graham 2018). Web 2.0 networks, like Facebook, are structurally different than the mechanisms in previous studies of digital organizing because they are dynamic spaces that allow people to engage in more personal and interactive ways. Early digital communication ("Web 1.0"), like e-mail or blogs, were designed to distribute information. In contrast, Web 2.0 spaces were created to mimic the most salient features of offline communities. These digital spaces allow people to create online profiles; find like-minded individuals; engage in debates; establish their own private groups; and move from a single-interaction format (e.g., reading a website) to repeated, real-time interactions (Margetts et al. 2016). The existing union organizing literature suggests that "offline" communities can help build labor solidarity (Hedström 1994; Jarley 2006; Kerr and Siegel 1954), but has technology progressed to a point to which these digital networks can establish a similar level of connection?

Focusing on the ridehail industry, one of the most developed parts of the "gig" economy, this article presents a mixed-methods study of the relationship between digital interaction on Web 2.0 social networking sites (SNS), like Facebook, and workers' interest in collective representation. The first part of this article develops a case study of a ridehail drivers' group in the American Midwest. Based on interviews with members of the group, archival data, and daily observation, I map how online spaces can be used in a way that builds a collective labor identity. Bridging the "offline" and "online" worlds, I find that workers use online spaces to coordinate their face-to-face meetups and develop connections "offline." Next, using this case study and interview evidence from fifty-five drivers located across the United States, I developed a ridehail-specific survey instrument to measure the relationship between workers' interaction

on social media and their interest in joining a labor organization. Using responses from more than 450 ridehail drivers, this article finds that more frequent interaction with other ridehail drivers is significantly associated with greater interest in collective representation. This finding provides empirical support that Web 2.0 digital communities are associated with workers' interest in joining a labor organization and presents initial evidence of a new organizing tool for labor, the online worker network.

Conceptual Framework

Over the past few years, there have been a growing number of gig workers engaging in collective labor actions. In early 2018, Deliveroo riders in Hong Kong, Belgium, and the Netherlands boycotted the service (Cheung 2018). Later in 2018, ridehail drivers in India engaged in a strike against Olo and Uber (Ghosh 2018). In 2019, Uber drivers in Australia did the same (McGinn 2018). After another round of pay cuts in March 2019, Uber and Lyft drivers in Los Angeles staged a 25-hour citywide strike (Kesslen and Chen 2019). Similarly, more than 2400 Instacart workers signed an online petition calling for pay protection and better compensation (Fickenscher 2019). Gig worker organizations have emerged in Seattle, New York City, and London (Scheiber 2017). Considering the barriers to organizing these workers—they are spatially isolated, may never speak with a coworker or supervisor, do not have set work schedules, and are told they “can be their own boss”—this is a surprising level of collective activity (Rosenblat and Stark 2016: 3763).

Online worker networks seem to be related to these organizing efforts. Research has found that Uber and Lyft drivers use online social networking tools, like Facebook groups, to help spread information about the labor conditions in their industry (Aleks, Maffie, and Saksida Forthcoming; Rosenblat 2018a). This research suggests that drivers use online spaces to exchange information about working ridehail, such as unexpected pay cuts, insurance gaps, and how to dispute disciplinary actions (Rosenblat 2018a). Absent a shared physical workspace, research has found that these forums act as a “virtual watercooler” where workers can gather and talk about organizing the industry (Rosenblat 2018a: 14). For example, in May 2019, drivers used Facebook groups to plan and execute their nationwide protest prior to Uber's initial public offering (IPO):

From a labor organizing perspective, it's a feat that drivers were able to organize at all. There's no central company-wide communication platform for drivers to easily coordinate or message each other (labor

activists say this is by design), so workers organize largely through a network of regional Facebook groups where drivers share their grievances and plan action. (Ghaffary 2019)

Amazon Mechanical Turk (mTurk) workers also appear to be organizing on digital networks. For example, using a digital forum, mTurk workers wrote a collective letter to Amazon Chief Executive Officer Jeff Bezos calling for better working conditions on the mTurk platform (Kessler 2018). Additionally, studies find that more experienced mTurk workers help onboard and provide support for newer workers in these forums (Irani and Silberman 2015). These acts of mutual aid may have sparked some mTurk workers' interest in joining a labor union:

Irani has seen an evolution of Turkers' views. "When we first began Turkopticon, the reaction workers had was, 'We don't want to be in a labor union. Is this going to turn into a union thing?'" Irani says. (Turkopticon is not a labor union and was not founded with formal unionization in mind.) "But over the years, it seems workers have become more open to how unions can help them. They see how recalcitrant Amazon has been on making changes." (Greenhouse 2016)

Despite anecdotal evidence, there is an ongoing debate in the academic literature about the role of digital communication in forming long-term bonds between workers. For example, Heckscher and McCarthy (2014) found that digital connections are associated with individual labor actions but are insufficient to build labor solidarity. Additionally, Saundry, Stewart, and Antcliff (2012) found that workers derive social capital from digital communication with others, but labor unions had a difficult time transferring these connections into formal membership. Beyond these studies, scholars have examined other digital communication channels, like how employees communicate via websites (Fitzgerald, Hardy, and Lucio 2012), e-forums (Greene, Hogan, and Grieco 2003; Robinson 2006), employee association websites (Heckscher and Carré 2006), union websites (Panagiotopoulos and Barnett 2015), message boards (Saundry, Stewart, and Antcliff 2012), "friending" activity (Heckscher and McCarthy 2014), and how unions use social media (Panagiotopoulos 2012). Across these studies, scholars have not found evidence that digital communication lends itself to a collective labor identity or that it improves workers' interest in joining a trade union.

More recent research, however, suggests that online communities may create a collective identity that could lend itself to joining a union. In Wood, Lehdonvirta, and Graham's (2018) study of microtask workers, the authors argue that workers use digital networks for mutual aid, such as providing

feedback on projects. Similar evidence has been found in traditional service jobs, such as Pasquier and Wood's (2018) study of Walmart workers' use of social media. Even more strongly, Wood (2015) found that worker networks, like Facebook, are associated with worker mobilization and development of a collective identity that lends itself to trade unionism. Finally, Wood and Lehdonvirta (2019) found that online forums can help gig workers develop a sense of collective grievance against their platforms.

Research in the field of computer-mediated communication provides a lens by which to understand the divide in the existing literature. Early research on digital organizing studied one-to-many communication channels, like listservs or website visits. In these communication channels, a single author provides information for a group to read ("one-to-many"), but the group can rarely engage with one another. Scholars refer to these communication channels as "Web 1.0" mechanisms because they have a wide reach and can expand rapidly (e.g., spam e-mail lists), but the one-to-many format lacks the interactive elements that allow for a sense of connection and community to emerge (Shirky 2008). As a result, there is a growing consensus that these forms of communication do not lend themselves to building durable bonds between individuals (Tufekci 2017). Early empirical work that looked at how the Internet affects union organizing, like Heckscher and McCarthy (2014) and Saundry, Stewart, and Antcliff (2012), fit both the promise and limitations of this architecture.

A new Internet structure, called "Web 2.0," tries to re-create offline communities in online spaces (Tufekci 2017). To do so, Web 2.0 structures, like SNS, build on Web 1.0 mechanisms in a way that creates a greater sense of community among participants (Margetts et al. 2016). In Web 2.0 spaces, people are co-creators of these digital communities; specifically, they are designed around interpersonal interaction. In Web 2.0 communities, users establish routines and norms; partake in rituals, debates, discussions; and set boundaries for their groups (Rice and Aydin 1991; Skeels and Grudin 2009). Furthermore, these communities can even develop a formal hierarchy and elect moderators who can remove people from a group for violating a group's rules and norms (Lange 2007; Papacharissi 2009). Group boundaries are beneficial because they allow users to craft areas in which they are less likely to encounter resistance or retaliation for their ideas and identities (Choi and Park 2013). These boundaries can also grant a veil of anonymity to people who wish to provide support but fear reprisal. Finally, compared to "offline" activism, like pen-and-paper petitions or posting fliers, scholars argue that the personal and real-time nature of Web 2.0 interaction lends itself to building cohesive connections between individuals (Margetts et al. 2016). While Web 1.0 spaces are created

to distribute information (e.g., e-mail), Web 2.0 spaces are designed to replicate traditional communities in a digital medium (e.g., Facebook).

Scholars argue that Web 2.0 mechanisms increase the strength of network ties between users, allowing them to build more cohesive social bonds (Guan and Tate 2013; Tufekci 2017). For example, studies have found that individuals who interact on Web 2.0 social networks are more likely to engage in sustained political participation (Bond et al. 2012; Earl and Kimport 2011; Lim 2012; Sandoval-Almazan and Gil-Garcia 2014). Others have found that these interactions are associated with both partaking in public protests and a desire to maintain participation in the future (Hara 2008; Harlow 2011; Ley and Brewer 2018). While this framework has been applied to political movements, like the Women's March and the Arab Spring (Tufekci 2017), it unclear if workers use online networks in a similar fashion. This is an empirical question: Do workers use Web 2.0 communities in a way that would develop stronger network ties between community members?

Qualitative Research Strategy

Research setting. To explore whether ridehail workers use SNS in a way that could give rise to a collective identity, I engaged in a 6-month qualitative research study to map how workers socially engage one another. Following previous ethnographic research on ridehail driver communities (Rosenblat 2018b), I embedded myself in five ridehail driver Facebook groups. The first community was established for a medium-sized midwestern college town. To start, I contacted the group administrator over Facebook messenger and asked him if he would be willing to share his experience as a ridehail driver. After interviewing the group administrator, he (digitally) introduced me to the rest of the Facebook group and asked them to consider speaking with me about their experience in the industry. Of the active drivers, 20 percent ($n = 6$) agreed to be interviewed. These interviews ranged from 30 to 60 minutes. Additionally, I was a daily observer of this community for the next 3 months. Beyond interviews, I exchanged text, Facebook, and e-mail messages with group members about their experiences in the industry, how they related to the Facebook group, and their relationships with other drivers.

To examine how interactions on digital spaces vary by community size, I embedded myself in four other digital communities and observed how drivers communicated on these forums. These communities were selected because they require drivers to submit their activation e-mails as a condition of membership. The largest (more than 13,000 members) is composed of drivers located across the United States. The others are smaller, ranging in the

hundreds of users. I observed these on a daily basis for 2 months. Because data gathered from online communities can possibly lead to identifying these users, posts that appear in this study have either been paraphrased or modified (Coughlan and Perryman 2015).

Building on this ethnographic work, I interviewed ridehail drivers to see how they understand their work and build community with one another. Using snowball sampling, I was able to conduct twenty-one semi-structured interviews with ridehail drivers. Drivers ranged in experience from just starting in the industry to having worked more than 10,000 rides. These interviews ranged from 10 minutes to more than 3.5 hours. After these initial interviews, I travelled to New York City and interviewed drivers as they entered and exited Uber's main office in the lower part of Manhattan. These interviews were shorter, ranging from just less than 3 minutes to 15 minutes. When that office closed, I interviewed workers as they exited Uber's office on Long Island.

Initial interviews included broad questions about why drivers chose to begin driving ridehail, what challenges they had experienced in the industry, how they connect with other drivers, what differences they see across platforms, and if they had experienced compensation changes. Interview questions were updated as new interviews provided information regarding additional methods of connecting with other drivers. Similar to past studies of online ridehail driver communities (Chen et al. 2019), data were iteratively coded after each interview. Once these interviews reached theoretical saturation (Glaser and Strauss 1968), I returned to early interviewees for member-checks (Lincoln and Guba 1985). In total, I interviewed fifty-five ridehail drivers for this project.

Qualitative Findings

Midwestern college town Facebook group. The founder of the medium-sized Midwestern Facebook group said that a conflict with an intoxicated passenger led him to start the group. In April 2016, the driver received a 5:00 AM ride request from a passenger looking to travel to a city nearly 2 hours away. Upon arrival at the destination, the passenger attempted to give the driver a large cash tip, but because it was against Uber's policy at the time, the driver declined the payment. Despite the driver's objection, the passenger left a nearly 100 percent cash tip on the backseat of the car. The driver described what happened next as his motivation for forming the group: "The next day I got an email from Uber that he [the passenger] was contesting the charges and accused me of accepting a cash payment for the ride. . . . You can

get in trouble for this. . . . It freaked me out. If I say yes, will I get deactivated? . . . That was one of the biggest things in starting the [city] group.”

The Facebook group is a closed group, allowing administrators to act as boundary managers who set the norms and behaviors that determine group membership. For example, when admitting a new member to the group, an administrator will post an announcement welcoming the new group member, asking how long they been driving, and what kind of vehicle they use. As explained by both the moderator and other drivers, the group is interested in knowing the make and model of group members’ vehicles in order to identify each other as they drive around town. Other routines have emerged as well, such as one driver posting daily weather updates, discussion of local events that may influence ridehail demand (like local concerts or festivals) and if the app is busy or “dead.” For example, drivers have posted about driving “non-stop” for several hours, that they have not received a single “hit” (job) all day, and inquiries about the number of jobs people have received that day.

Sometimes customers contact drivers directly to schedule rides in advance. Airport runs are particularly lucrative, and if a driver cannot accept the ride, they often will post the job to the group. Although they are nominally competitors, as explained by the group’s founder, “a rising tide lifts all boats.” Other times a group member will post about their personal transportation needs, such as one driver who posted that their partner needed a ride home from the hospital that evening. One driver I interviewed mentioned that he uses the group to make sure that family members have reliable transportation: “[m]y wife was driving to [city] and I needed someone to pick her up, so I posted on there that I needed someone to pick her up. I’ve done that a couple of times. It’s good to be in touch with the other drivers in town.”

While waiting for a passenger request, drivers will frequently meet at a place they call “the village,” a bank parking lot near the edge of the local college. One driver I interviewed said that the group will line up their cars in the parking lot and “chew the fat” while trading stories about passengers’ outrageous or unusual behaviors. In our interview, this driver told me about a passenger he transported at 1:00 AM night before. This passenger requested that the driver stop the car because she was going to be sick. Upon pulling the car over to the side of the road, the passenger exited the car and vomited in a stranger’s front yard. The story was particularly memorable because the homeowner walked onto the porch holding a glass of water and asked the passenger if she would like it.

When I asked this driver if s/he considered the group members friends, the driver replied: “[f]riendship is a good word for it. We are not friends from the aspect that we go over to each other’s houses, but we are friends in the aspect we will sit in the same area at night and pick on one another when someone

gets a call.” Another driver said that s/he received “a little bit of comradery” out of being part of the group. Group members also engaged in acts of mutual aid; for example, one driver discussed following another group member because s/he believed the passenger request was from an unusual area of town: “[h]e [fellow group member] had a call one night [where] he couldn’t find the customer and I was in the neighborhood, so I just went over and backed him up just to make sure he found his customer. It’s not that we really have any trouble here in [city], but something could happen.”

A similar sense of collective identity is reflected in some of the messages posted to the Facebook group. For example, one driver expressed enthusiasm for “our”—the collective—business: “[g]reat meeting everyone and great ideas! Can’t wait for what comes from our business!” (Facebook post). While other times drivers post business ideas for the group to consider, such as, “[w]hat do you think about Pokémon Go tours using Uber?” Drivers also use the forum to coordinate a social gathering, such as a holiday party, with a poster suggesting a holiday gift exchange (where all the gifts had to be “travel related”).

Through discussions with drivers and observing their digital behavior, it appeared that network formation was both enabled by the platform technology (over text messages and social media) and drivers also used these tools to coordinate their meetups offline, such as in “the village.” These data were valuable in mapping how these communities formed and how drivers connected in an otherwise disconnected industry.

Drivers also use the group for collective support. As a college town, drivers frequently have to confront drunken or disruptive passengers. More seasoned group members have posted their e-mail exchanges with Uber’s customer service (in screenshot format) to help less experienced drivers navigate Uber’s system. These screenshots are useful for showing newer drivers how to use Uber’s “help” features and what to expect when contacting Uber. Similar to mTurk workers, these drivers would also warn each other about potential customers to avoid, such as one particular customer who was leaving “one-star” ratings.

In 2016, the group engaged in one of its first coordinated actions toward Uber. At the time, Uber’s application (app) began malfunctioning, preventing passengers from being able to request a ride. As some drivers were relying on Uber for income, the passenger app crashing was a serious economic challenge. A group administrator (admin) posted that the passenger app was not working, but that s/he had contacted customer support about it. Two days later, the admin posted a status update about the situation, informing the group that two of the admins had contacted Uber support to see when the app would begin working again. Despite their efforts, group members told me that it took

weeks to resolve the issue; all the while, drivers received “stock responses” each time they reached out to Uber. The group engaged in other collective actions, such as printing their own business cards; creating a group logo; and, frustrated by Uber’s lack of advertising in the area, pooling their resources to pay for local advertisements.

Evidence from larger Facebook groups. Larger digital forums appeared to function as news outlets and sources of driver support. For example, after Travis Kalanick stepped down as Uber’s chief executive officer, one driver posted, “the witch is finally dead!” Midsized groups functioned similarly as the college town group, with drivers regularly asking for help regarding Uber’s disciplinary policies. For example, one driver, after losing access to the platform as a result of a passenger complaint, posted that s/he was “livid” about how little support Uber provided drivers. Other drivers posted about their feelings of frustration, with one driver stating, “Why should we bother. Uber takes it all. Looking for a different job next week.” Finally, some drivers explicitly called for concerted activity, such as one driver who posted, “We should start a union.”

These qualitative data suggested the following pattern: while many gig workers may work alone and enjoy the entrepreneurialism of this industry, when a conflict with a customer occurs, they are often unaware of their responsibilities or how to handle the situation. Without coworkers or a union to ask for support, workers turn to their most immediate community: an online network like Facebook. Once part of this group, however, many find that they share grievances with other drivers and enjoy the comradery and support of their digital colleagues. Similar to observations about mTurk workers and other studies of gig worker mobilization (Cant 2019), drivers appeared to develop a sense of connection to the wider group. In short, these data suggest that conflict with passengers leads to social connection, and those social connections lead to a sense of being part of a larger community with shared concerns and grievances.

Quantitative Research Strategy

Using these qualitative data, I developed a ridehail-specific survey instrument to collect data on: (1) frequency of conflict with passengers, (2) frequency of interaction with other ridehail drivers, (3) interest in joining a ridehail drivers’ association. Data were gathered through a mobile survey that was pushed to drivers’ smartphones. Mobile push surveys are useful for contacting geographically isolated and other difficult-to-reach populations

(Bradburn, Rips, and Shevell 1987; Shiffman, Stone, and Hufford 2008; Stone et al. 2002). To maximize the response rate, this survey was designed to be taken while waiting for a passenger request.

Survey participants. Ridehail drivers were recruited for this study in two ways. The first set of study participants was recruited with the aid of a worker organization in a large northeastern metropolitan area. The worker organization sent both text messages and e-mails to its members notifying them of the study. Workers were informed that this study would be about labor conditions in the ridehail industry. At the end of the 3-week sign-up period, 226 drivers had registered to participate.

Second, I recruited ridehail drivers using the “popular worker gathering spot” research strategy (Lind et al. 2000; Rosenblat and Stark 2016). In the world of digital work, this means using online gathering spots to identify and recruit participants. Because Uber (and other gig companies) do not provide onboarding or much other information about how to use the service, drivers frequently turn to online resources. Harry Campbell, a former ridehail driver, has one of the most popular websites for new ridehail drivers. Campbell’s website is routinely cited by major news outlets, such as the *New York Times*, *Washington Post*, and *Time* magazine. Importantly, drivers rarely engage one another in the comments section of this website, meaning this sample is unlikely to create a digital sense of community in the same way a SNS would. Campbell posted a call for participants on his website in summer 2017 and sent an e-mail to his mailing list notifying drivers about the study. This recruitment method yielded 234 participants.

Comparison to other demographics. Because this was not a random draw of drivers, reported demographic information was checked against three previous demographic studies of ridehail drivers (Table 1). In comparison to these three benchmarking studies, the participants in this study were slightly younger and more racially diverse than previous studies of the ridehail industry. To ensure these demographic differences were not driving the results, models were reweighted to reflect the data found in Hall and Krueger (2017). The reweighted models did not change any of the relationships of interest. Given how closely the demographics of this study match previously conducted research, this is not unexpected. Additionally, the number of people in this sample with personal or vicarious experience in a union (48.1 percent) is higher than union density in the United States in 2017 (10.7 percent). It is important to note that this is because union experience, both personal and vicarious, is cumulative over time, resulting in significantly higher union

TABLE 1
DEMOGRAPHIC DESCRIPTION OF SAMPLES

Variable	BSG (2014), Hall and Krueger (2017)	Kooti et al. (2017)	Campbell (2017)	Maffie (2020)
Age 18–29	19.1	—	6.5	25.2
30–39	30.1	—	16.0	23.4
40–49	26.3	—	23.5	35.7
50–64	21.8	—	29.7	14.2
65+	2.7	—	24.3	1.5
Female	13.8	24.0	19.0	16.2
Less than high school	3.0	—	1.7	1.9
High school	9.2	—	8.5	10.3
Some college/associate’s degree	40.0	—	23.6	28.2
College degree	36.9	—	33.8	39.7
Postgraduate degree	10.8	—	16.4	19.8
White non-Hispanic	40.3	60.0	78.3	58.9
Black non-Hispanic	19.5	21.0	6.8	11.0
Asian non-Hispanic	16.5	4.7	4.0	13.1
Other non-Hispanic	5.9	—	3.5	6.2
Hispanic	17.7	13.7	7.1	10.8
Union experience [Yes]	—	—	—	48.1
Number of drivers	601	220,000	1150	462

Notes: (a) Sample statistics reported as a percent. (b) BSG and Kooti et al. are both Uber-only studies, whereas Campbell and Maffie are cross-platform surveys. (c) Since Campbell’s (2017) survey, Lyft had started operating in more than 100 smaller markets in the United States.

exposure compared to the number of workers covered by a contract at any moment in time (Budd 2010).

The first dependent variable in this study, union instrumentality, is a modified version of Davy and Shipper’s (1993) three-item union instrumentality scale. The first two questions from Davy and Shipper’s scale were left unchanged. The third item, however, was an imperfect fit for this population of interest; it asked respondents about how unions affect the relationship between employees and companies, yet ridehail companies have repeatedly told drivers that they are independent contractors and not employees. To remove this possibly confounding effect, I included in its place a question that asked, “I believe that a drivers’ union would harm my work as a rideshare driver.” This item was reverse coded to parallel the construction of Davy and Shipper’s scale. The modified scale returned a Cronbach’s alpha of 0.77. Scale information, including questions, means, and standard deviations, is available in Appendix A.

This study considered, but declined to use, two other established measures of union support: (1) social pressure and (2) job satisfaction (Davy and Shipper 1993). The “social pressure” scale largely assumes workers who interact with other employees in a traditional workplace (e.g., “How many, if any, of

the people you know at work do you think will vote for the union?”). Likewise, the job satisfaction scale assumes a single bilateral employer–employee relationship, which is inapplicable when drivers work for multiple different companies (Prassl 2018). Instrumentality, however, asks general questions about workers’ views on how unions change the workplace (e.g., unions make sure workers are fairly treated or receive better pay) that could reasonably apply to gig work. Additionally, previous research has found that union instrumentality is useful at predicting voting behavior with newly hired workers because these workers are unlikely to have strong views about their current employer (LaHuis and Mellor 2001). Because ridehail drivers usually leave the industry after 6 months (Farrell and Greig 2016), instrumentality is the most useful predictor for these workers.

The second dependent variable is interest in a ridehail association. As previous studies have found digital communities lead to support for associations and other nontraditional labor organizations, respondents were asked to evaluate the statement, “I would consider joining a rideshare drivers’ association.” Responses ranged from Strongly Agree (5) to Strongly Disagree (1; mean = 3.78, standard deviation [SD] = 0.70).

The first independent variable is a social connection scale. Drivers were asked to evaluate the frequency with which they (1) texted with other drivers, (2) interacted with drivers in face-to-face meetings, and (3) engaged with drivers on social media. Drivers were asked to evaluate their frequency of interaction with other drivers over these mediums: (1) Never, (2) Rarely, (3) Sometimes, and (4) Frequently. These three items were summed into a “social interaction” scale that returned a Cronbach’s alpha of 0.75 (mean = 2.03, SD = 0.89). This scale was similar to other studies of digital connections and political action (texting, e-mail, face-to-face, and social media; Ley and Brewer 2018).

Independent variable 2 is social media interaction. This article also tests the social media item (mean = 2.16, SD = 1.17) from the social interaction scale to see if greater social media interaction is associated with stronger views on union instrumentality and interest in joining a ridehail association.

Conflict frequency is the third independent variable. Respondents were asked to evaluate the frequency of their conflicts with customers. Conflict events were identified based on my interviews with ridehail drivers. The survey asked about the following events: (1) having to file a complaint about a passenger with a ridehail service, (2) filing for a cleanup fee with a ridehail service, (3) passengers squeezing too many people in the vehicle. Available responses were (1) Never, (2) Almost Never, (3) Less than Once a Month, (4) Once a Month, (5) Every Week, and (6) Every Time I Drive. Items were summed into a scale that returned a 0.74 Cronbach’s alpha (mean = 2.70, SD = 1.11).

Several self-reported variables were included to control for possible co-variation with a worker's interest in collective representation. Race, full-time or part-time driver status, and education variables were collected in the same fashion as Hall and Krueger (2017). Additionally, respondents were asked if they had ever worked in a unionized environment or if a family member had worked in a unionized firm. This was coded as a binary variable: those who have previous experience (self or family) with unions were coded as 1 and those who do not were coded as 0. Finally, to determine how long drivers had been working ride-hail, drivers were asked the month they began driving for their first platform.

Empirical specification. This study uses structural equation modeling (SEM) to estimate the relationship between social interaction and workers' interest in collective representation. This modeling technique was selected because it can specify the expected relationships among conflict with passengers, social interaction, and workers' interest in a union or labor association (Hayes and Rockwood 2017). Furthermore, this method has been used to estimate workers' behavior in hypothetical organizing campaigns (Park, McHough, and Bodah 2006).

Because conflict was measured in set time intervals (e.g., weeks, months, never, etc.), this measure will be influenced by how often drivers work ride-hail. To account for this, a path was added between part-time work and the conflict scale. Furthermore, conflict at work has long been associated with interest in joining a labor organization (Brett 1980). To account for this, a path between conflict and the dependent variable was added to each model. Tests of model fit found these paths significantly improved model fit (Chi squared test of model fit $p < 0.001$). Mediation analysis was conducted following Baron and Kenny (1986). SEM models were fit using Lavaan (v.0.6-3) in R.

Quantitative Findings

Table 1 displays the sample breakdown while Table 2 describes the summary statistics for the variables in these models. Table 3 reports the full goodness-of-fit statistics for each model. Both absolute and relative fit statistics indicate these models fit the data fairly well ($\chi^2 < 0.01$, root mean square error of approximation [RMSEA] < 0.08 , standardized root mean square residual [SRMR] < 0.08 , comparative fit index [CFI] > 0.90).¹

¹ One model falls slightly short of the suggested CFI measure (0.892), it passes the other three goodness-of-fit measures. Experts argue these measures are useful rules of thumb, but emphasize to not use them as direct cutoffs (Fan and Sivo 2005, 2007; Markland 2007).

TABLE 2
DISTRIBUTION OF CONTINUOUS VARIABLES

Variable	Mean	SD
Social interaction scale	2.03	0.89
Total months driving	21.37	14.52
Social media interaction	2.16	1.17
Interest in joining a ridehail association	3.78	1.15
Union instrumentality	3.57	0.99
Conflict frequency	2.70	1.11

TABLE 3
SEM MODEL FIT STATISTICS

	Chi-Squared	CFI	RMSEA	SRMR
Model 1	$\chi^2 < 0.001$	0.892	0.069	0.057
Model 2	$\chi^2 < 0.001$	0.913	0.066	0.063
Model 3	$\chi^2 < 0.001$	0.938	0.058	0.062
Model 4	$\chi^2 < 0.001$	0.937	0.062	0.058

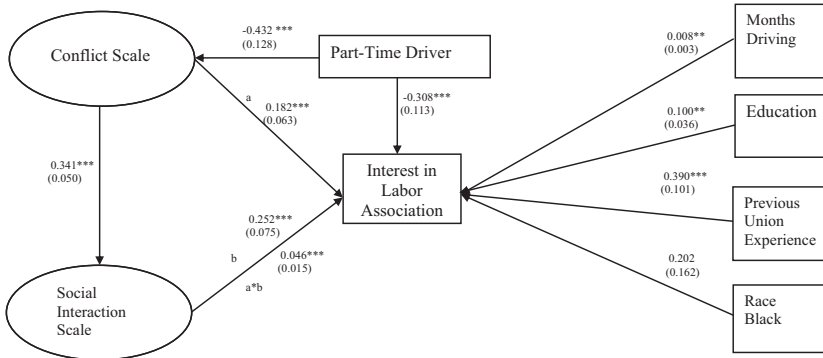
Notes: (a) Models correspond to SEM figure labels. (b) While there is a debate about the range of fit values, the following are generally considered acceptable fit: $\chi^2 < 0.01$, CFI > 0.90, RMSEA < 0.08, SRMR < 0.08 (Hooper, Coughlan, and Mullen 2008; Klein 2005).

Figure 1 displays the SEM in which interest in joining a ridehail association acts as the dependent variable. As suggested by my qualitative research, this model returned a significant positive association (0.341, $p < 0.01$) between customer conflict and the social interaction scale. Furthermore, social interaction with other drivers returned a significant positive association (0.252, $p < 0.01$) with a driver’s interest in joining a ridehail association. These findings are consistent with my qualitative research that suggested customer conflict leads workers to seek out other drivers for help, and that these connections influenced how workers view collective labor organizations. Similarly, Figure 2 reports the models in which social media interaction acts as the independent variable of interest. Once again, conflict was significantly associated with social media interaction (0.339, $p < 0.01$), while social media interaction was positively associated (0.141, $p < 0.01$) with workers’ views on joining a ridehail drivers’ association.

Figures 3 and 4 display the SEM results in which a worker’s view on union instrumentality is the dependent variable. In Figure 3, drivers’ frequency of interaction with other ridehail drivers acts as the independent variable while the last model uses drivers’ social media interaction as the independent variable of interest. Figure 3 shows a significant positive association (0.342, $p < 0.01$) between the incidence of passenger conflict and workers’

FIGURE 1

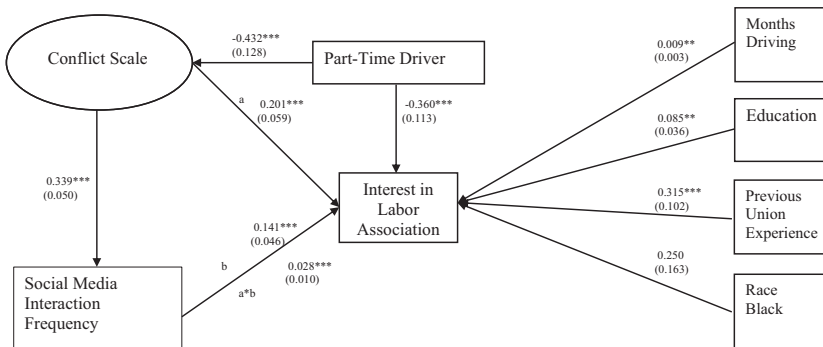
SEM REGRESSING INTEREST IN JOINING A RIDEHAIL ASSOCIATION ON WORKERS' FREQUENCY OF SOCIAL INTERACTION WITH OTHER DRIVERS



Note: Statistical significance at the 1 percent, 5 percent, and 10 percent levels is indicated by ***, **, and *.

FIGURE 2

SEM REGRESSING INTEREST IN JOINING A RIDEHAIL ASSOCIATION ON WORKERS' FREQUENCY OF SOCIAL MEDIA INTERACTION

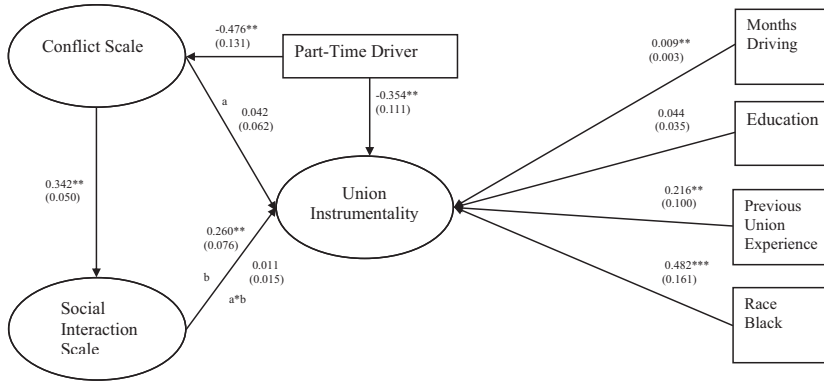


Note: Statistical significance at the 1 percent, 5 percent, and 10 percent levels is indicated by ***, **, and *.

interactions with other drivers. Additionally, this model indicated that more frequent interaction with other drivers is significantly associated (0.260, $p < 0.01$) with more positive views of union instrumentality. In the final

FIGURE 3

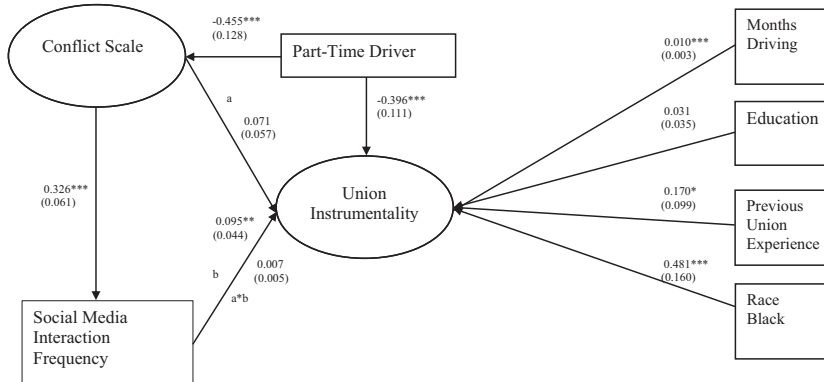
SEM REGRESSING UNION INSTRUMENTALITY ON WORKERS' FREQUENCY OF SOCIAL INTERACTION WITH OTHER DRIVERS



Note: Statistical significance at the 1 percent, 5 percent, and 10 percent levels is indicated by ***, **, and *.

FIGURE 4

SEM REGRESSING UNION INSTRUMENTALITY ON WORKERS' FREQUENCY OF SOCIAL MEDIA INTERACTION



Note: Statistical significance at the 1 percent, 5 percent, and 10 percent levels is indicated by ***, **, and *.

model, drivers' social media interaction acts as the key independent variable. Again, this model returned a positive association between conflict frequency (0.326, $p < 0.01$) and social media interaction. The social media variable was

significantly associated (0.095, $p < 0.05$) with workers' views on union instrumentality.

Discussion

This article has three implications for labor organizing using modern Internet architecture. First, this article found that gig workers use online communities in a way that is conducive to developing a collective identity. The qualitative data illustrated that workers develop collective norms (e.g., greetings/initiations, weather updates), engage in communal activities (e.g., sharing business ideas, holiday parties), and rituals (e.g., meeting up at “the village”) in these online communities. Group “orchestrators” police the boundaries of the group; monitoring who engages in appropriate conduct; and directing the group’s collective actions, like calls to Uber’s customer service line. Furthermore, these data illustrate how social bonds emerge from digital spaces and facilitate offline meetups, like waiting for a ride request in “the village.” Although previous studies have linked interaction on digital spaces with a collective labor identity (Wood and Lehdonvirta 2019; Wood, Lehdonvirta, and Graham 2018), this study uses the Web 2.0 literature to develop the mechanisms that may be behind these results.

Building on this case study, the quantitative models provide evidence that the relationship between online connection and interest in collective labor organizations holds even after controlling alternative factors. Each model reported a strong positive association between the frequency of offline conflict and workers' social interactions with other ridehail drivers. Furthermore, this article found that more frequent social interaction in digital spaces was associated with more positive views on unions and an improved interest in joining a labor association. This set of findings provides a wider context for online worker communities: in lieu of direct support from an employer or coworkers, workers build support networks to help manage the problems they encounter at work. For those without a shared workspace, like ridehail or microtask workers, online networks provide the most immediate place for these workers to gather. Within these networks, workers gain a wider view of their industry and can form the types of social bonds that can translate into collective action. By tracing how conflict influences workers' social networks, and then how those social networks influence their collective identity, this article bridges workers' offline motivations for seeking out these forums with how online networks may influence workers' interest in collective representation.

Second, as suggested by the growing number of labor actions in traditional industries like hospitality and education, this article’s core argument extends

beyond the gig economy. Reports suggest that Facebook and other social media tools have played a prominent role in recent labor actions, like the West Virginia, Oklahoma, and Los Angeles teacher strikes. These examples are a testament to the flexible nature of Web 2.0 spaces: they are as wide or as narrow as their users need them to be. For some workers, organizing a single work site may be sufficient, while others can create groups that link together workers at a local, state, or even regional level. Digital communities also provide labor organizers with a method of instantaneously contacting workers outside the workplace, circumventing one of the existing bottlenecks in “offline” organizing campaigns. Nearly 20 years ago, labor scholars thought the Internet might allow unions to organize an increasingly fragmented and isolated labor force. While Web 1.0 failed to fulfill these expectations, this article suggests that Web 2.0 may finally possess the technological underpinnings to deliver on its promise.

Finally, for the academic community, this article shows how using the Web 1.0 versus 2.0 framework can help clarify the digital organizing literature. Studies that examined Web 2.0 structures tend to be more optimistic about digital organizing (e.g., Wood 2015; Wood and Lehdonvirta 2019; Wood, Lehdonvirta, and Graham 2018), while those that studied Web 1.0 architecture are less so (e.g., Heckscher and Carré 2006; Heckscher and McCarthy 2014; Saundry, Stewart, and Antcliff 2012). Although others have suggested this may be the reason behind the existing split in the literature (Wood, Lehdonvirta, and Graham 2018), no study has explicitly tested the underlying mechanism, strength of network ties. By developing a test around this mechanism, this article provided evidence that more frequent interaction in digital forums is associated with more positive views on collective labor organizations. In doing so, this article suggests that the rift in the literature is rooted in the changing nature of the Internet. By introducing the computer-mediated communication literature on the shifting nature of digital interaction, this study is able to clarify the literature and provide a path forward for future research in this area.

Limitations and Future Research

There are several limitations to this study. First, similar to previous research examining workers’ views on unions, cross-sectional designs raise questions of causality (Aleks 2019; Panagiotopoulos 2012; Park, McHough, and Bodah 2006) because they cannot rule out unobserved endogeneity and measurement error (Haber 2016; Osterman and Weaver 2016). Unlike these previous studies, however, the research presented here offers a qualitative case study to lend

additional credibility to its analysis. Accordingly, it is important to read the quantitative findings in the context of this article's larger empirical strategy. This study began by examining how ridehail drivers used social media to connect and understand their industry. Once a relationship between driver interaction and collective behaviors was observed, I used those qualitative data to build a ridehail-specific survey instrument. Additionally, these relationships are also consistent with longitudinal qualitative studies of gig worker mobilization (Cant 2019). Despite the statistical limitations of cross-sectional data, the consistent qualitative and quantitative evidence presented here, supported by a growing body of published work in multiple fields, suggests there is a relationship between the variables of interest.

Second, I cannot rule out the possibility of a reverse causal relationship; that is, workers who are more interested in collective action are more active on social media. While possible, this finding would run counter to previously published research studying Web 2.0's influence on other social movements (e.g., Tufecki 2017; Tufecki and Wilson 2012). Furthermore, my qualitative data suggest that it is the process of association, both through Facebook and offline, that builds the necessary connections for drivers to create digital solidarity. This path of events, in which workers first seek out like-minded colleagues and then move action offline, is consistent with both the way workers described their experiences in this article and previously developed theoretical frameworks in multiple disciplines (e.g., Margetts et al. 2016). Finally, the SEM technique helps control for reverse causality by constraining the paths by which conflict and social interaction operate.

Third, sample participants were not randomly drawn from the population of ridehail drivers. As others have noted, it is difficult to sample nonstandard workers because many rapidly enter and exit these work arrangements (Farrell, Greig, and Hamoudi 2018). This problem is compounded in gig arrangements in which workers have no obligation to work for any amount of time and can move between companies at will; even platforms do not know the total number of workers on their platform. In short, given the structure of these work arrangements, even a random draw from a gig company may not yield a representative sample. Yet as seen in Table 1, this sample is close to the randomly drawn sample of Uber drivers in Hall and Krueger (2017), the random draw of Yahoo! users (Kooti et al. 2017), and Harry Campbell's (2017) nonrandom (but cross-platform) demographic benchmarks. Given the similarity between this sample and these other samples, the nonrandom nature of participants is less likely to be driving the results. Furthermore, reweighting the models to match Hall and Krueger's sample demographics did not change the main results of this study.

Conclusion

Today, interactions are virtual and physical, text-based and spoken, asynchronous and simultaneous, broad and narrow. The emergence of Web 2.0 digital communities has forged new links between people and changed the way information is transmitted between workers. This article suggests that digital communities have the capacity to build bonds between workers and create a sense of collective identity. These bonds may be able to alter the way people view their relationship with other workers and set the foundation for future collective action. In short, the same technology responsible for the emergence of platforms appears to be connecting workers in new ways as well, and in doing so, may change the way workers view the role of unions in emerging types of work.

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APPENDIX A – UNION INSTRUMENTALITY SCALE

The following questions formed the union instrumentality scale. The following responses were available: Strong Agree (5), Agree (4), Neither Agree nor Disagree (3), Disagree (2), Strongly Disagree (1). These results are corrected for reverse coding so that Strongly Agree is coded as "1" and Strongly Disagree is coded as "5" for these questions.

1. Unions make sure that workers are fairly treated by supervisors (mean: 3.73, SD = 1.13)
2. Unions help working men and women to get better wages (mean = 3.90, SD = 1.06)
3. I believe that a drivers' union would harm my work as a rideshare driver (mean = 3.08, SD = 1.38)

Cronbach's alpha: 0.77

APPENDIX B – SOCIAL INTERACTION SCALE

The following questions formed the social interaction scale. The following responses were available: Frequently (4), Sometimes (3), Rarely (2), Never (1).

1. I communicate with other drivers over text messages (mean = 2.04, SD = 1.07)
2. I interact with other drivers over social media (e.g., Facebook, Twitter, etc.) (mean = 2.16, SD = 1.17)
3. I meet up with other drivers socially (mean = 1.81, SD = 1.02)

Cronbach's alpha: 0.75

APPENDIX C – CONFLICT SCALE

Using the scale below, please identify the option that best represents your experience with the following statements/events:

1. I file a complaint with a rideshare company over passenger behavior (median = 2.0, mean = 2.27, SD = 1.23)
2. I file a cleanup fee due to a passenger damaging my vehicle (median: 1.0, mean = 2.97, SD = 1.48)

3. Passengers attempt to "squeeze" too many passengers into my vehicle beyond the legal limit (median = 2.0, mean = 2.85, SD = 1.39)

Cronbach's alpha: 0.74

Possible responses: Every time I Drive (6), Every Week (5), Once a Month (4), Less than Once a Month (3), Almost Never (2), Never (1)

APPENDIX

TABLE A1

SEM RESULTS REGRESSING INTEREST IN JOINING A DRIVERS' ASSOCIATION ON FREQUENCY OF SOCIAL MEDIA INTERACTION AND FREQUENCY OF GENERAL SOCIAL INTERACTION

	Interest in Joining a Drivers' Association	Interest in Joining a Drivers' Association
Race—Black	0.250 (0.163)	0.202 (0.162)
Education	0.085** (0.036)	0.100*** (0.036)
Drives part time	-0.360*** (0.113)	-0.308*** (0.113)
Has experience with a union	0.315*** (0.102)	0.390*** (0.101)
Total driving time (months)	0.009*** (0.003)	0.008** (0.003)
Conflict scale	0.201*** (0.059)	0.182*** (0.063)
Social media interaction frequency	0.141*** (0.046)	—
Social media frequency × Conflict scale	0.028*** (0.010)	—
Social interaction scale	—	0.252*** (0.075)
Social interaction scale × Conflict scale	—	0.046** (0.015)
Number of observations	453	451
Chi-Sq/CFI/RMSEA/SRMR	$\chi^2 < 0.001/0.913/0.066/0.063$	$\chi^2 < 0.001/0.892/0.069/0.057$

Notes: (a) The number of conflicts drivers will experience can vary based on how frequently drivers work ridehail. To control for this, all models included a path (not shown) between part-time status and conflict frequency ($p < 0.01$). (b) Statistical significance at the 1 percent, 5 percent, and 10 percent levels is indicated by ***, **, and *.

TABLE A2

SEM RESULTS REGRESSING UNION INSTRUMENTALITY ON FREQUENCY OF SOCIAL MEDIA CONNECTION
AND FREQUENCY OF GENERAL SOCIAL INTERACTION

	Union Instrumentality	Union Instrumentality
Race—Black	0.481*** (0.160)	0.482*** (0.161)
Education	0.031 (0.035)	0.044 (0.035)
Drives part time	-0.396*** (0.111)	-0.354*** (0.111)
Has experience with a union	0.170* (0.099)	0.216** (0.100)
Total driving time (months)	0.010*** (0.003)	0.009*** (0.003)
Conflict scale	0.071 (0.057)	0.042 (0.062)
Social media interaction frequency	0.095** (0.044)	— —
Social media frequency × Conflict scale	0.007 (0.005)	— —
Social interaction scale	— —	0.260*** (0.076)
Social interaction scale × Conflict scale	— —	0.011 (0.015)
Number of observations	438	436
Chi-Sq/CFI/RMSEA/SRMR	$\chi^2 < 0.001/0.938/0.058/0.062$	$\chi^2 < 0.001/0.937/0.062/0.058$

Notes: (a) The number of conflicts drivers will experience can vary based on how frequently drivers work ridehail. To control for this, all models included a path (not shown) between part-time status and conflict frequency ($p < 0.01$). (b) Statistical significance at the 1 percent, 5 percent, and 10 percent levels is indicated by ***, **, and *.