Über-Alienated: Powerless and Alone in the Gig Economy

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Running Head: Alienation and gig work

ABSTRACT

While the gig economy has expanded rapidly in the last decade, few have studied the psychological ramifications of working for an online labor platform. Guided by Marx's theory of alienation, we investigate whether platform work has deleterious psychosocial consequences for workers in the form of an increased sense of personal estrangement and isolation. We analyze data from two national surveys of workers from the Canadian Quality of Work and Economic Life Study in September 2019 (N= 2,460) and March 2020 (N=2,469). Analyses reveal greater levels of powerlessness and loneliness among those working for an online labor platform—a pattern that is not explained by platform workers' higher financial strain. We also find some evidence for socioeconomic contingencies in the association between platform work and powerlessness. We interpret our findings in light of the unique position of platform firms to leverage algorithmic management tools to undermine worker autonomy.

Über-Alienated: Powerless and Alone in the Gig Economy

INTRODUCTION

Is participation in the gig economy empowering or alienating? The growth of flexible, short-term contracts and freelance work—signature features of the gig economy—has sparked debate about whether these temporary work arrangements reflect worker empowerment or precarization (Sundararajan, 2016; De Stefano, 2016). Central to the gig economy is an on-demand labor model, often referred to as platform work, which has been popularized by firms like Uber and Fiverr, and that has spread widely across economic sectors, impacting jobs in transportation, care work and professional services (Farrell & Greig, 2016; Jeon, Liu & Ostrovsky, 2019). The flexibility afforded by this labor model has led some to see platform work as a foundation for personal growth (D'Cruz & Noronha, 2016), while others have decried the degree to which the algorithmic nature of platform work undermines worker autonomy and individuality (Vallas & Schor, 2020).

These debates have resonance with larger questions of the psychological consequences of work that have a long history in social sciences, particularly in studies that relate the nature of work to the origins of alienation. Although alienation is a multifaceted concept (Chiaburu, Thundiyil & Wang, 2014; Seeman, 1991), a common theme in the study of alienation is that it represents psychological estrangement from self or others (Schacht, 2013), which may in turn have substantial adverse effects for well-being (e.g., Mirowsky & Ross, 2003). Much research has tied the structure of work to consequences for individual alienation (Chiaburu et al., 2014), and in the current study we use this body of research as a basis to argue that the organization of platform work presents ideal work conditions for fostering a sense of personal estrangement and isolation, as captured by perceptions of powerlessness and loneliness. While the nature and skill

requirements of platform work vary widely, we identify common organizational strategies of platform firms involving algorithmic management that may make platform workers particularly vulnerable to these forms of alienation.

To test these arguments, we utilize data from two national cross-sectional studies of working Canadians: the 2019 and 2020 *Canadian Quality of Work and Economic Life Studies* (C-QWELS I and II). We show that platform workers report greater levels of powerlessness and loneliness, and this association cannot be explained by platform workers' vulnerability to financial difficulties. We also find some evidence for socioeconomic contingencies in the association between platform work and powerlessness, which likely reflects status-based heterogeneity in the skill and activities of platform workers, in turn differentiating consequences for alienation. In summary, the gig economy is growing (Jeon, Liu & Ostrovsky, 2019), but there has been little empirical study of the social-psychological ramifications of participation in this economy. The current article therefore makes an important contribution by linking participation in the gig economy to classical concerns regarding the social-psychological effects of work, and showing that participation in the gig economy may have deleterious consequences for workers in the form of increased alienation. In the following sections we briefly review alienation scholarship, before outlining its relevance to the organization and social psychological impacts of platform work.

BACKGROUND

The context of work plays a substantial role in the study of the foundations of alienation, stretching back to the classical origins of the concept of alienation. Marx identified the fundamental sources of alienation in the conditions of labor (Mendelson, 2012). Alienating

conditions of labor could be seen as structural arrangements in which workers were deprived of control over the means of production and defined by the surplus value of their labor (Comninel, 2019:14). The consequence of these structural arrangements was that workers experienced multiple forms of estrangement. An individual was "estranged from the product of his labor, from his life-activity" (Marx, (2009 [1844]):78), and estrangement from the products of one's activities in turn lead to an estrangement from self (Swain, 2012). The division of individuals from the product of their labor not only divided individuals from themselves, but from others as well, as the estrangement of individuals from themselves also "means that one man is estranged from another" (Marx, (2009 [1844]):78). From this perspective, in being reduced to service of the larger machinery of production, individuals are denied the experience of collective efforts involved in production (Burkitt, 2019). The focus of alienation on estrangement from the product of our labor and others has continued into more modern conceptualizations, which argue that "at a fundamental level, alienation refers to distancing or detachment from others or things" (Chiaburu et al., 2014:25).

Modern research on work and alienation is heavily influenced by Seeman's (1959) emphasis on a sense of powerlessness as a key manifestation of alienation from self and object. Powerlessness fits well into a general understanding of estrangement from objects and self because powerlessness represents a perceived disconnect between individuals' personal actions and what happens in their life (Ross, Mirowsky & Pribesh, 2001). A vast literature on social structure and personality has revealed paid work characteristics that are associated with powerlessness, including closely supervised work with limited job discretion (Glavin, 2013; Kohn & Schooler, 1983; Ross & Mirowsky, 1992; Schieman & Plickert, 2008). These patterns lend support to Marx's argument that alienation reflects wage laborers' lack of control over the

means of production, while also supporting the view of powerlessness as a learned expectation that is influenced by social-structural arrangements over the life course (Ross & Sastry, 1999; Schieman & Narisada, 2014)

Yet, an emphasis on powerlessness overlooks the Marxian inclusion of isolation as a key manifestation of the alienating conditions of labor. Social isolation was also included in Seeman's (1959) framework of forms of alienation, with Seeman (1991) eventually identifying loneliness as a central component of social isolation. This emphasis on loneliness as a form of alienation has been echoed by others as well (Schacht 2013), but the ties between loneliness and alienation have not often been appreciated in recent studies of loneliness. Instead, loneliness is often framed as "perceived social isolation" (Cacioppo, Capitanio, & Cacioppo, 2014:2), and defined in terms of the sense of deficiency in connection to and fulfillment from others (de Jong Gierveld, Tilburg, & Dykstra, 2018; Hughes, Waite, Hawkley, & Cacioppo, 2004). Yet, as this definition shows, loneliness expresses the feeling of estrangement from others, and therefore encompasses Marx's and subsequent emphases on separation from others as a key form of alienation.

With the noteworthy exception of Rogers' (1995) study of worker isolation and alienation in the temporary help industry, recent research on work and loneliness is not typically framed within the context of alienation. Indeed, empirical examination of workplace factors associated with loneliness is itself scarce (Ozcelik & Barsade, 2018), with most research limited to specific occupations that are prone to isolation because of the nature of the work performed, including freelancing and jobs in the travel and transportation industries (Hatami et al., 2019; Williams, 2015; Petriglieri et al., 2019). Rarely is perceived isolation examined as a form of worker

estrangement, and beyond the work of Rogers (1995), we are unaware of research examining how these perceptions are shaped by the structural characteristics of paid work arrangements.

As we describe below, platform work in the gig economy not only fits the conditions of work delineated in previous research that foment perceptions of powerlessness and social isolation, but platform gig work presents ideal conditions for powerlessness and loneliness as manifestations of alienation.

The Gig Economy and Its Relation to Alienation

Gig workers represent a growing segment of the workforce, with some studies estimating that as many as twenty-percent of the working population in North America have participated in the gig economy (Bracha & Burke, 2019; MBO Partners, 2018; Angus Reid, 2019). The label of gig work broadly describes temporary employment that is compensated on a piece-rate basis (Jeon et al. 2019), but the bulk of recent scholarly and public attention has focused on platform gig work, in which intermediary firms use a combination of cloud-based and geolocation technologies to coordinate and match workers with clients and customers (Vallas & Schor, 2020).

Two forms of platform work—location-based on-demand work and online crowdwork—have grown rapidly since the 2009 Great Recession (Corporaal & Lehdonvirta, 2017; Jeon et al., 2019). Location-based on-demand work captures geographically constrained person-to-person services including delivery and transportation, home maintenance, and care work (Ravenelle, 2019). Online crowdwork, in contrast, is performed remotely, ranging from skilled professional freelancing services, (e.g. graphic design, computer programing etc.) to less skilled 'microtasks' such as data entry and image classification (Berg, 2016). Although research estimating the

prevalence of platform work is nascent, Canadian estimates suggest that participation in the platform economy grew 140 percent between 2008 and 2016 (Jeon et al., 2019).

The considerable range of activities performed by platform workers, especially for those in online crowdwork, means that their skill levels and occupational backgrounds vary widely. Nonetheless, as we discuss in the next sections, there are similarities in the organization of online platform firms that allow us to make generalizations about platform workers' vulnerability to alienation. Our discussion therefore focuses on examining common management and technological strategies of platform firms, and how these features likely generate feelings of powerlessness and isolation among platform workers.

Platform Work and Powerlessness

Views on platform work and powerlessness diverge based on whether platform workers are considered free from the constraints of traditional work organizations. An early reaction to emergence of the gig economy posited that gig workers represented a new breed of 'microentrepreneurs' who enjoyed considerable control over their work schedules and client base (D'Cruz & Noronha, 2016; Sundararajan, 2016). Many have come to question this positive portrayal, with some of the most pointed critiques emanating from industrial sociology and digital surveillance literatures that are home to more critical theories of power and control in the workplace (Morgan & Nelligan, 2018; De Stefano, 2016; Andrejevic, 2019). A core focus of these critiques is platform firms' use of data capturing and algorithmic management techniques to control the labor process and undermine worker autonomy (Vallas & Schor, 2020).

While platform firms generally relinquish direct supervisory control over workers, they nonetheless exert considerable indirect control through extensive monitoring and surveillance. It

is common for freelancing platforms to record the screens and keystrokes of workers, while rideshare and delivery platforms collect detailed data on driving behaviours and trip transactions (Calo & Rosenblatt, 2017; Wood et al., 2019). The collected data is used by software algorithms to automate a variety of decisions including worker compensation and retention, leaving little room for worker input. Beyond the automation of decisions, the monitoring and measurement of work activity also enables more subtle techniques to influence worker behavior. Uber, for example, uses 'gamification' strategies to keep drivers on the road with nudge messages and awards enticing them to take additional trips to reach income targets (Gandini, 2019). Whether or not these soft control strategies are successful, many workers are nonetheless aware of their existence and feel their constraining influence (Rosenblatt & Stark, 2016).

Customer evaluations represent an additional mechanism of control for platform firms. Rideshare drivers, for example, face automatic temporary dismissal if their rating falls below a certain decimal threshold, leading some drivers to go to great lengths—such as offering bottles of water and snacks—to keep their ratings up (Jamil, 2019). These actions could be construed as entrepreneurial, but given the penalties imposed on drivers with low ratings, such behaviours are better described as coerced (De Stefano, 2016). In addition, although workers are free to choose their schedules and the platform they work for, competition for assignments means that workers' schedules are often instead dictated by customer demand, while a worker's ability to choose between assignments is hindered by a lack of transparency about available jobs (Rosenblat & Stark, 2016). Rideshare and delivery drivers, for example, are free to accept or reject an assignment, but because they are often deprived information about the destination of the assignment until after they accept it, their ability to make informed scheduling decisions is limited (Woodcock, 2020). Thus, even if platform work superficially appears entrepreneurial

and agentic, beneath this facade is a substantially impaired action, subject to extensive levels of monitoring and with only limited control over meaningful work decisions (Shapiro, 2017; Woodcock & Waters, 2018). Given these conditions, we expect platform workers to exhibit higher levels of powerlessness than those in more traditional work arrangements.

Hypothesis 1: Platform work should be associated with higher levels of powerlessness.

Platform Work and Loneliness

Similar to temporary agency work, which has been argued to reproduce the labor market vulnerability of disadvantaged groups of workers (Rogers, 1995), the organization of platform work structurally separates workers, while also distancing workers from clients and customers. This distancing primarily serves to ensure the primacy of the platform's position as intermediary (Vallas & Schor, 2020), much in the same way that temporary staffing agencies seek to prevent clients from directly hiring temporary workers (Elcioglu, 2010). These conditions also deprive platform workers of meaningful social connections, though, making the workers particularly vulnerable to estrangement from others in the labor process.

Sociologists and organizational researchers have long considered the workplace as a key setting for forging social connections and a sense of belonging (Jahoda, 1982; Mayo, 1949; Neal & Seeman, 1964; Whyte, 1957). Platform workers, however, generally operate outside the boundaries of traditional organizational environments, which means they have fewer opportunities for work-related social encounters and the chance to participate in broader work-based communities. Crowdwork platforms are particularly prone to fomenting isolation because work assignments are performed entirely remotely and most require little contact with clients or other workers. The limited interaction among freelancers is in part because of the intense

competition for assignments on freelancing platforms (Graham & Anwar, 2020), while platform firms often prohibit workers from directly contacting clients outside of the platform interface (Wood et al., 2018).

Rideshare drivers and other platform workers involved in person-to-person services conceivably have the greatest opportunity for customer interaction; yet, these encounters are often fleeting or involve strained, performative interactions due to the importance of receiving positive reviews (De Stefano, 2016; Möhlmann & Henfridsson, 2019). As an Uber driver described his experience, "Uber is 'lone wolf' kind of work. You get in your car and you start driving. You don't have anyone to talk to about it" (quoted in Bowles, 2016). Similarly, in-store shoppers that fill grocery orders made via an online platform such as Instacart generally have little contact with other store employees, given their status as independent contractors (Howcroft, Dundon, & Inversi, 2019; Kessler, 2018). The structure of gig work therefore renders exposure to others during the workday as an insufficient condition for personally meaningful social encounters. Based on these arguments, we expect that participation in platform work is likely to be critical in creating a sense of social isolation.

Hypothesis 2: Platform work should be associated with higher levels of loneliness.

Financial Strain as an Alternative Explanation

Our arguments thus far have adopted a structural interpretation of the origins of self-estrangement among platform workers; yet, we acknowledge that there are alternative explanations beyond the organization of platform work that may account for platform workers' vulnerability to alienation and that warrant consideration. Chief among these is stressful financial circumstances that challenge workers' powerlessness and, to a lesser extent, loneliness (Fokkema, De Jong, & Dykstra, 2011; Mirowsky & Ross, 2003). Financial strain is especially

prominent because it is a key experience that connects structural conditions of inequality to individual experiences, as the experience of financial strain can "condemn people to a grinding life of uncertainty and fear" (Pearlin, 1999:399). Financial strain therefore directly connects to a loss of a sense of control, and a lack of financial resources can also inhibit social interactions and lead to a sense of separation that can enhance loneliness.

With regard to the hypothesized association between platform work and alienation, financial strain may operate in one of two ways. First, there is emerging evidence that many workers pursue platform work out of financial necessity (Kessler, 2018)—a possibility that is supported by a wider self-employment literature, which reveals that insufficient wage work opportunities motivate some entrepreneurship transitions (Glavin, Filipovic, & van der Maas, 2019). Financial difficulties may therefore operate as a confounding factor that precedes and predicts the experience of alienation and the decision to become a platform worker, creating a spurious association between our focal independent variable and outcome.

Alternatively, rather than confounding our hypothesized focal association, financial strain may be a competing mechanism to our proposed structure of platform work argument. Reports of low pay and unpredictable hours are common among platform workers (Berg 2016). The prospect that these conditions lead to financial strain among platform workers may mean that any revealed association between platform work and alienation may not be spurious but instead 'redundant.' A concept within the elaboration model, redundancy represents a condition that occurs when the influence of a focal independent variable on an outcome variable overlaps substantially with the influence of another independent variable. As Anesehensel (2012:227) describes, an association is redundant when it: "[d]oes not represent a solitary explanation of the dependent variable but is providing the same information that is provided by the other

independent variable." Establishing the existence of redundancy requires the researcher to statistically control for the alternative proposed mechanism. In light of these possibilities, we include financial strain as a control variable in our analyses. Observing an association between platform work and powerlessness/loneliness after adjusting for financial strain would consequently strengthen our argument for a causal association due to the organization of platform work.

Education Contingencies

While algorithmic management and distancing strategies tend to be ubiquitous across platform firms, the work activities and socioeconomic backgrounds of platform workers are quite diverse (Jeon et al., 2019). It is possible that within this diversity we may see variation in platform workers' susceptibility to alienation. Platform workers' varying educational attainment is especially salient in this regard, since education is a marker of socioeconomic status linked to an array of personal and occupational resources that may buffer the negative impacts of platform work (Mirowsky & Ross, 2003). We therefore consider whether the hypothesized relationships between platform work and powerlessness and loneliness vary due to workers' formal education.

We suggest two explanations for why education might shape platform workers' experiences of alienation. First, educational attainment fosters a variety of cognitive abilities and coping skills that have been demonstrated to buffer individuals from an array of social stressors (Mirowsky & Ross, 2003; Schieman & Plickert, 2008). These same traits and skills may also help platform workers to resist efforts to control and isolate them. Rosenblat and Stark (2016) describe, for example, the technological workarounds used by skilled remote platform workers to evade digital surveillance techniques of the platform. Relatedly, Petriglieri and colleagues (2019) suggest that professional freelancers are often keenly aware of the social isolation posed by their

work, and actively seek out healthy routines and workspaces that offer opportunities for social interaction. Such coping strategies may therefore ameliorate the impact of platform work on perceived powerlessness and isolation. Second, better educated workers are more likely to work in higher-skilled, creative occupations that have historically been most successful in avoiding employer monitoring and control (Edwards, 1979; Zuboff, 1988). Professional workers also tend to have access to occupational communities of practice that can offer social support and a sense of identity and belongingness (Adler, Kwon, & Heckscher, 2008). Greater educational attainment will therefore tend to sort individuals into platform work with more autonomy and less isolation. Based on these ideas, we examine whether individuals with more education are less susceptible to the alienating consequences of platform work.

> *Hypothesis 3: The association between platform work and powerlessness and loneliness should be weaker among those with higher education.*

METHODS

Sample

We analyze two waves of data collected as part of the Canadian Quality of Work and Economic Life Study (C-QWELS), which conducted national surveys in 2019 and 2020 to examine social conditions and well-being among employed Canadians. Data were gathered by the study authors in cooperation with the Angus Reid Forum, a Canadian national survey research firm that maintains an ongoing national panel of Canadian respondents.[1] The C-QWELS I was gathered from September 19th to September 24th, 2019, and was an online survey conducted among a representative sample of 2,524 working Canadians. The response rate was 42%. Results were statistically weighted according to the most current education, age, gender and region Census data to ensure a sample representative of working Canadians. The C-QWELS

II was conducted from March 17th to March 23rd, 2020 with another nationally representative sample of 2,530 working Canadians. The response rate was 43%, and responses were similarly weighted. Of the 5,054 total respondents, 4,929 are retained in the analytic sample (2019 Sample=2,460; 2020 Sample=2,469), a retention rate of over 97%, suggesting little bias due to listwise deletion. Since it is unusual in large-scale survey research to have independent population samples, we leverage both waves to test our hypotheses—offering the rare opportunity in population research determine if patterns are replicated across samples.

Focal Measures

Powerlessness. We assess perceptions of powerlessness using four items from Pearlin and Schooler's (1978) mastery scale: "You have little control over the things that happen to you," "There is really no way you can solve some of the problems you have," "You often feel helpless in dealing with problems of life," and "Sometimes you feel that you are being pushed around in life." Response choices ranged from *strongly agree* (1) to *strongly disagree* (4). Following previous approaches to measuring powerlessness (see Ross, Mirowsky & Pribesh, 2001), responses were reverse coded and averaged so that higher scores reflect a greater sense of powerlessness (C-QWELS I and II Cronbach's alphas= .83).

Loneliness. Loneliness was adapted from a validated three-item scale designed for use in surveys (Hughes et al., 2004). Respondents were asked about the frequency of the following in the past month: (a) "Feel like you lacked companionship," (b) "Feel left out," and (c) "Feel isolated from other people?" Response categories were: all of the time (1), most of the time (2), some of the time (3), a little of the time (4), and none of the time (5). All responses were coded

so that higher values indicated more frequent experiences. Loneliness was measured as the mean of responses to these three questions (C-QWEL I and II Cronbach's alphas= .84, .80).

Platform work. Participation in platform work was assessed with the following question: "Do you currently engage in the "gig economy"? In other words, do you ever undertake freelance work (for pay) using an app-based service company (like Uber, Lyft, Airbnb, UpWork, Task Rabbit or Skip the Dishes)?" Respondents who indicated "yes" were coded as platform workers (1) versus (0) for those reporting no platform work.

Education is dummy-coded as respondents with a university degree or higher (1) versus all other respondents (0). Additional analyses (not presented) tested an education measure that also differentiated graduate degree holders from university degree holders. These analyses produced similar results as those presented in the paper. We retain the binary education measure since this avoids low cell sizes when we investigate a platform work-by-education interaction term as part of our test of hypothesis 3.

Financial strain is assessed with three items. Respondents were asked: "how often did you have trouble paying the bills" and "how often did you not have enough money to buy food, clothes, or other things your household needed." Response choices are coded: "never" (1), "rarely" (2), "sometimes" (3), "often" (4), and "very often" (5). A third item asked: "How do your finances usually work out by the end of the month?" Response choices are coded: "a lot of money left over" (1), "a little money left over" (2), "just enough to make ends meet" (3), and "barely enough to get by" (4), and "not enough to make ends meet" (5). Responses from the three items summed and averaged; higher scores indicate more financial strain (C-QWELS I and II Cronbach's alphas=.85 and .84).

Controls

We include controls for a number of aspects of employment conditions that are standard controls when examining the effects of employment, including occupational class, work hours, number of jobs, and employment status. *Occupational class* was measured using a five-category classification— service, professional, clerical, and laborer and other occupation—with service as reference, while *work hours* for all jobs was included as a continuous measure. We also include a measure of whether respondents work more than one job to capture *multiple jobholding*. Responses were indicated by a dichotomous variable in which the higher value (1) indicated "multiple jobholder" versus single jobholder (0). Furthermore, respondents' *main employment status* was measured with a dichotomous indicator, coded 1 for those who indicated that they held a permanent employee position versus all other employment arrangements (0).

We also include a number of demographic characteristics that are common controls in studies of powerlessness and loneliness because these measures address differences in a number of background aspects of structural disadvantage. These include income, age, gender, minority status, marital status, and presence of children. Respondents' *household income* for the year prior to the interview is modelled with a series of dummy categories: from $25,000 or less (the reference category) to $150,000 and higher. *Age* is modeled as a continuous variable. Gender is coded as (1) for women and (0) for men. Racial and ethnic minority status is typically measured in Canada using the designation of "*visible minority*" (Little, 2016). To capture visible minority status respondents were asked: "Would you say you are a member of a visible minority here in Canada (in terms of your ethnicity/race)?" Responses were indicated by a dichotomous variable in which the higher value indicated "visible minority." *Marital status* was indicated by a dummy variable for cohabitating and married individuals (1), and contrast with "single" respondents (0).

A dummy variable is also used to indicate *presence of children*, with reports of one or more children in the household (1) contrasted to those with no children (0).

Plan of Analysis

We follow a three-step approach in our analytical strategy. We first provide information on the two study samples, before presenting a bivariate breakdown of selected social characteristics of platform workers. We report these bivariate results since there are few studies that examine platform work in the general working population, leading to a knowledge gap in our understanding of who actually participates in the platform economy. We then conduct multivariate analyses with OLS regression to test our focal hypotheses. Table 1 reports descriptive statistics for all measures in the multivariate analyses. Tables 2 and 3 present bivariate analyses that illustrate the social distribution of platform workers and associations between platform work and focal outcomes. Tables 4 and 5 present results from OLS regression analyses with powerlessness (Table 4) and loneliness (Table 5) regressed on platform work participation and controls (model 1). We then adjust for respondents' financial difficulties (model 2). Finally, we test a platform work x university degree interaction (model 3) to investigate whether the association between platform work and powerlessness/loneliness is contingent on respondents' education level.

RESULTS

Descriptives and Bivariate Analyses

Table 1 presents weighted descriptive statistics for focal measures and controls in the September 2019 and March 2020 samples. There are few noteworthy differences across the samples. The prevalence of platform work in March (13.5%) was slightly higher than in

September (11.8%), although this difference was not statistically significant. These results suggest a nonnegligible number of Canadians are engaged in platform work. Table 2 presents social status comparisons of engagement in platform work. Visible minorities and younger workers are more likely to report platform work, but we find no evidence of significant gender or education differences in platform work. These patterns are consistent across September 2019 and March 2020 samples.

Table 3 presents a bivariate comparison of platform workers' and nonplatform workers' reported levels of financial strain, and their perceptions of powerlessness and loneliness. Platform workers report statistically significant higher levels of financial strain in both September and March samples. As preliminary support for hypotheses 1 and 2, platform workers also report statistically significant higher levels of loneliness and powerlessness. Presenting these differences as semi-standardized differences—represented in units of standard deviation of powerlessness/loneliness—can aid interpretation of their magnitude. The loneliness semi-standardized difference was .49 and .50 in the September and March samples respectively, indicating half of a standardized deviation increase in loneliness for platform workers—a substantial difference. The powerlessness difference across platform and non-platform workers was similarly large in both samples (semi-standardized differences of .42 and .43 respectively). To illustrate the relative size of the powerlessness difference between platform and nonplatform workers, we compare it to the powerlessness difference between who hold a university degree and those with less than a degree—since education is an established and strong predictor of powerlessness (Mirowsky and Ross 2003). Expressed as a semi-standardized difference, the platform-nonplatform work difference in powerlessness (.42) is 2.4 times larger than the difference between university degree and nondegree holders (.17).

Multivariate Results

Table 4 reports results from OLS regression analyses of powerlessness for the September 2019 and March 2020 samples. Since the results of these analyses are similar across samples, we present September/March patterns together, highlighting any noteworthy differences. For both samples, Model 1 reveals a statistically significant positive association between platform work and powerlessness, adjusting for control measures. Model 2 includes a measure of respondents' financial difficulties to investigate if the greater perceptions of powerlessness among platform workers is in part or fully due to their underlying economic circumstances. Higher levels of financial strain are significantly associated with a greater sense of powerlessness. Furthermore, the association between platform work and powerlessness is reduced by approximately 35% for both samples, although this association remains significant. Despite the weakened platform work-powerlessness association after adjusting for financial strain, the standardized difference in powerlessness remains substantial at .22 and .20 for September and March respectively. The majority of the tendency for platform workers to report higher powerlessness is therefore not explained by their greater vulnerability to financial strain—indicating support for hypothesis 1.

In model 3 of Table 4, we include a 'platform work x university degree' interaction to examine whether the association between platform work and powerlessness varies by respondent's education level. In the September sample, the interaction is not statistically significant, indicating no support for hypothesis 3. This stands in contrast to the March sample, however, in which the interaction coefficient is statistically significant, revealing evidence of a positive association between platform work and powerlessness only among those without a university degree. Ancillary analyses showed that, among individuals without a university degree, the association between participation in platform work and powerlessness is statistically

significant (b=0.214, p<0.001), but this association is not significant among individuals with a university degree (b=0.037, p>0.10). Since the education contingency is limited to the March sample, we therefore find only partial support for hypothesis three, and we will address the possible reasons for this inconsistent evidence in the discussion section.

Results for the analyses of loneliness are similar to results for powerlessness, with the exception of the results regarding the interaction tests. Table 5 presents results from OLS regression analyses of loneliness for both samples. Model 1 reveals that platform workers report statistically significant higher levels of loneliness than nonplatform workers—a pattern that is consistent across September and March samples. In model 2, the inclusion of financial strain weakens the positive platform work coefficient; however, the association with loneliness remains statistically significant. The focal association is reduced by approximately 20% in both samples with the introduction of financial strain. Moreover, the standardized difference in loneliness remains strong at .24 and .25 for September and March respectively. As with powerlessness, financial strain is associated with higher loneliness, but only accounts for only a minority of the platform work-loneliness association. Thus, beyond their exposure to more financial difficulties, platform workers exhibit higher levels of loneliness—providing support for hypothesis 2. In model 3, the coefficient for the 'platform work x university degree' interaction reveals no support for education contingencies in the underlying platform work-loneliness association for either sample (hypothesis 3). In contrast to the results for powerlessness, then, we observe no evidence that the association between participation in platform work and loneliness differs based on holding a university degree.

DISCUSSION

The structure and social-psychological consequences of work are perennial areas of interest in sociology, stretching back to Marx's discussion of the consequences of industrialization for alienation. The expanding nature of the gig economy through platform work draws attention to the relevance of these classical ideas to modern forms of work, and the degree to which the structure of platform gig work enhances alienation. Guided by Marx's theory of alienation and emerging qualitative accounts from platform workers, we leveraged two nationally representative samples of Canadians to examine potential psychosocial inequities between platform workers and more traditional workers—an investigation, which, to our knowledge, is the first of its kind. We find that approximately one in seven Canadians workers reported platform work in March 2020, a participation rate that is considerably higher than the most recent previous study on the issue (Jeon et al., 2019), which found that less than one in ten Canadians were engaged platform work in 2016—an increase that may reflect the growing popularity of on-demand food delivery and transportation services. We further find that participation in platform work is associated with higher levels of not only powerlessness, but also loneliness. Furthermore, the greater economic hardship reported by gig workers does not principally explain these associations.

Our ability to replicate the overall alienating associations of engagement in platform gig work, emphasizes a strength and contribution of the current research. Recent studies have suggested a "replication crisis" in social psychology (Świątkowski and Dompnier, 2017), leading to a recommendation that "researchers must not ignore the value of exact replications" (Stangor & Lemay, 2016:2). However, sociologically-oriented social psychology often relies on large probability surveys, and cost and time concerns limit the possibility of testing replication using

the exact same measures in two large surveys. It is for this reason that our findings present value, as we are able to show that strong associations with two different measures of alienation are consistent across repeated samples, thereby providing greater confidence in the primary results of this study and reinforcing the critical relevance of new forms of work to classical interests in alienation.

Marx's theory of alienation linked the human condition to the structural conditions of capitalist labor. Marx's theorizing on the consequences of working conditions for alienation has in particular served to link the structural conditions of work to perceptions of powerlessness (Mirowsky & Ross, 2003). There are, of course, noteworthy differences that distinguish the experiences of platform laborers from workers during the capitalist industrialization period described by Marx. Platform workers rarely have direct contact with their employer, and they have considerably more latitude over when and for how long they work than early industrial wage laborers. Nevertheless, as a perpetually insecure workforce that can be easily replaced by a plentiful reserve army of labor, we believe a Marxian analysis remains relevant and insightful to the study of platform work. In contrast to the more traditional overt control strategies commonly utilized by firms, a novel contemporary innovation of platform companies is their use of a largely invisible digital control apparatus comprised of software algorithms that dictate the experiences and opportunities of platform workers. The ability to hide the source of platform workers' constraints and isolation, and instead frame platform work as a form of entrepreneurship has been highlighted by others before us (De Stefano, 2016).

These arguments are supported by the finding that platform workers reported greater powerlessness by a considerable margin—a disadvantage that cannot be explained by coinciding experiences of financial strain. While the increasing commonality of platform work has been

hailed as an innovative fount of individual agency, the empirical evidence instead highlights the potentially demoralizing nature of this form of work, in which individual agency is undermined by an algorithm that must be satiated, and the monitoring of efficiency and customer satisfaction serves to routinize labor and homogenize individual action. These ideas resonate with some of the more critical arguments leveraged against the gig economy, which suggest that within the technological matrix of the platform, individual choice is fleeting and ultimately illusory, subjugated to the predominance of an algorithm (Andrejevic, 2019). Algorithmic management may represent a distinct and novel control technique of platform firms; yet, our findings nevertheless underscore the contemporary relevance of Marxian concerns regarding the disempowering nature of particular kinds of work.

In addition to powerlessness, we considered loneliness as an outcome of platform work. As a manifestation of perceived isolation, loneliness is central to Marx's original arguments about the separation of workers under capitalism. We find support for our prediction that platform workers would be more vulnerable to loneliness. This pattern speaks to a broader debate about the consequences of remote work and the eroding social contract between organizations and their workers. The themes of social isolation in Marx's writings have been less emphasized in sociologically-oriented psychology than those of powerlessness, but our findings underscore how modern labor conditions may deter communal work in favor of isolation under the guise of individuation. Such isolation has been argued to serve larger structural purposes by preventing collective action against structures of exploitation, but it also harms the worker by creating a greater sense of psychological separation in the form of loneliness. Loneliness, in turn, has been linked to numerous adverse health effects (Cacioppo & Cacioppo, 2014). These findings therefore illustrate how the structure of the contemporary gig economy can have adverse

consequences for the well-being of individual workers through not simply the direct experience of work, but also the damaging psychological residue this structure leaves behind.

Acknowledging the breadth of activities and skill levels of those that participate in the platform economy, we also investigated possible socioeconomic contingencies in the association between platform work and alienation—positing that platform workers with more formal education would experience fewer negative consequences. We find limited support for this prediction. Although we tested an interaction four times, in only one case—in the March sample for powerlessness—was there a significant difference in associations with platform work between those with and without a university degree. This result was in accordance with our expectations in hypothesis 3, as it showed that engaging in platform work was associated with powerlessness only among individuals without a university degree. It is possible that education is a more beneficial resource for helping a platform worker retain a sense of autonomy and control, but less useful for addressing the isolation that comes with working for an online platform. However, since we could not replicate this education-based difference, we suggest it should be interpreted cautiously. Further research should therefore continue to examine education differences in the consequences of platform work for alienation, to better determine the consistency of these differences. Larger sample sizes that afford greater specificity in levels of education would also help to determine the degree of education differences in the alienating consequences of platform work.

There are several limitations to this research that should be noted. Our ability to infer conclusions about causal relationships between platform work and powerlessness and loneliness are constrained by the cross-sectional nature of the C-QWELS samples. Further longitudinal research is necessary to identify the appropriate temporal sequencing between participation in

platform work and experiences of alienation, since it is possible the individuals who feel powerless and isolated seek out this form of employment. Relatedly, we argue the role of a set of structural characteristics common to platform work to explain its association with powerlessness and loneliness, but we do not directly test these as mediating mechanisms in the association. While the theorized mechanisms put forth are consistent with existing qualitative accounts of platform work, future research should incorporate measures of platform workers' perceived autonomy as well as the quality and quantity of their social interactions on the job. Furthermore, findings showing that financial stress does not substantially provide a redundant or spurious mechanism for these associations reinforces the likely importance of these theorized mechanisms.

CONCLUSION

The emergence of platform work has raised important questions about the future of work and organizations. If advocates of the platform economy are to be believed, online labor platforms enable workers to effectively capitalize on their time, resources, and unique skillsets. Yet, the higher levels of powerlessness and isolation that we observe among platform workers suggest that claims of worker empowerment should be met with some skepticism. We interpret our findings in light of the unique position of platform firms to leverage emerging digital technologies to control a disparate body of labor. The implications of these patterns, far from being novel, reinforce the arguments from classical perspectives of work that emphasize the human value of meaningful worker autonomy.

NOTES

1. The Angus Reid Forum contains enough people in each major demographic group to draw randomized samples that represent the population as a whole. In order to ensure that research participants accurately represent the public in terms of both demographics and attitudes, surveys are based upon representative samples from each panel that are randomized and statistically weighted according to the most current demographic and regional voting data available. For the C-QWEL study, sample selection started with creating a balanced sample matrix of the Canadian population. A randomized sample of Angus Reid Forum members were then selected to match this matrix to ensure a representative sample. Subsequent to this step, final sample data is analysed and weighted to a series of variables (Age, Gender, Region, 2015 Federal Election voting behavior) to ensure balanced representivity of all working Canadians.

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Table 1. Descriptive Statistics on Variables by Study (weighted)

	September 2019 Survey	March 2020 Survey
Powerlessness	2.200	2.230
Loneliness	2.100	2.122
Platform worker	.118	.135
Financial strain	2.287	2.288
University degree	.470	.430
Occupation		
Service	.188	.196
Professional	.400	.394
Clerical	.158	.124
Labor	.176	.173
Other	.078	.112
Work hours (all jobs)	41.039	39.004
Multiple jobs	.183	.182
Permanent employee	.821	.774
Household income		
Less than $25,000	.063	.073
$25,000-$49,999	.144	.139
$50,000-$99,999	.301	.302
$100,000-149,999	.221	.224
$150,000+	.171	.161
Missing income	.100	.101
Age	41.941	42.131
Women	.512	.516
Visible minority	.128	.138
Cohabitating or married	.582	.590
Children in the household	.321	.378

Notes. 2019 Sample: N=2,460; 2020 Sample: N=2,469

Table 2. Bivariate Breakdown of Platform Work Engagement

	September 2019 Survey	March 2020 Survey
	Proportion reporting platform work	
Gender		
Women (ref. category)	.125	.127
Men	.111	.149
Visible Minority		
Minority (ref. category)	.226	.224
Not a minority	.102*	.121*
Education		
University degree (ref. category)	.125	.143
No university degree	.112	.127
Age		
18-34 (ref. category)	.164	.170
35-49	.099*	.125*
50+	.082*	.109*

Notes. 2019 Sample: N=2,460; 2020 Sample: N=2,469

* proportion difference across groups statistically significant ($p<.05$) based on bivariate logistic regression model predicting platform work engagement (1) vs nonplatform worker (0) (weighted).

Table 3. Mean Comparisons of Focal Measures by Platform Work Engagement

	September 2019 Survey		March 2020 Survey	
	Platform Worker	Nonplatform worker	Platform Worker	Nonplatform worker
Financial strain	2.722*	2.228	2.746*	2.216
Powerlessness	2.478*	2.163	2.500*	2.188
Loneliness	2.527*	2.043	2.532*	2.057

Notes. 2019 Sample: N=2,460; 2020 Sample: N=2,469

* Platform-nonplatform worker difference is statistically significant ($p<.05$) based on adjusted Wald test (weighted).

Table 4. OLS Regression Analyses of Powerlessness

	September 2019 Survey			March 2020 Survey		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Platform worker	.252***	.162**	.172*	.223**	.142**	.214***
	(.058)	(.052)	(.080)	(.047)	(.044)	(.045)
Financial strain		.243**	.243***		.229***	.230***
		(.045)	(.016)		(.015)	(.014)
University degree	-.101**	-.022	-.019	-.078*	-.030	-.005
	(.038)	(.045)	(.034)	(.032)	(.031)	(.033)
Platform worker X University degree	---	---	.020	---	---	-.177*
			(.099)			(.083)
Occupation (ref. Service						
Professional	.044	.078	.077	-.144***	.-105*	-.111**
	(.045)	(.045)	(.043)	(.042)	(.041)	(.041)
Clerical	.066	.078	.077	.016	.043	.041
	(.052)	(.050)	(.050)	(.054)	(.051)	(.050)
Labor	.041	.083	.083	-.006	.013	.011
	(.056)	(.051)	(.051)	(.051)	(.048)	(.048)
Other	.138*	.109	.109	-.112*	-.106	-.106
	(.059)	(.055)	(.055)	(.058)	(.055)	(.055)
Work hours (all jobs)	.001	-.000	-.000	.001	.000	.000
	(.001)	(.001)	(.001)	(.001)	(.001)	(.001)
Multiple jobs	.010	-.021	-.021	-.040	-.060	-.058
	(.043)	(.042)	(.042)	(.039)	(.037)	(.037)
Permanent employee	.053	.051	.051	-.050	-.017	-.015
	(.040)	(.038)	(.038)	(.040)	(.038)	(.037)
Household income (ref. <$25,000)						
$25,000-$49,999	-.056	-.025	-.026	-.007	.008	.009
	(.099)	(.093)	(.094)	(.073)	(.070)	(.070)
$50,000-$99,999	-.165	-.059	-.060	-.180**	-.100	-.100
	(.097)	(.092)	(.093)	(.068)	(.065)	(.065)

Table 4 continued on next page

Table 4 Continued	September 2019 Survey			March 2020 Survey		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
$100,000-149,999	.231*	-.087	-.087	-.238**	-.087	-.084
	(.101)	(.098)	(.098)	(.073)	(.116)	(.070)
$150,000+	-.435***	-.206*	-.206*	-.293**	-.098	-.100
	(.103)	(.101)	(.100)	(.077)	(.075)	(.075)
Missing income	-.304	-.131	-.131	-.123	-.021	-.024
	(.110)	(.105)	(.105)	(.076)	(.074)	(.073)
Age	-.006***	-.006***	-.006***	-.005**	-.006***	-.005***
	(.001)	(.001)	(.001)	(.001)	(.001)	(.001)
Women	.088**	.061	.061	.052	.018	.017
	(.033)	(.031)	(.031)	(.041)	(.030)	(.029)
Visible minority	.069	.044	.044	.108*	.089*	.089*
	(.047)	(.044)	(.044)	(.044)	(.041)	(.041)
Cohabitating or married (ref. single)	-.025	-.004	-.004	-.021	-.007	-.006
	(.037)	(.034)	(.034)	(.035)	(.034)	(.034)
Children in the household	.050	-.009	-.009	-.017	-.079*	-.079*
	(.035)	(.125)	(.125)	(.033)	(.032)	(.032)
Constant	2.570	1.906	1.905	2.710	2.090	2.071
R-square	.088	.189	1.89	.085	.176	.180

Notes: 2019 Sample: N=2,460; 2020 Sample: N=2,469
Standard errors presented in parentheses
*p < 0.05, **p < 0.01, ***p < 0.001 (two-tailed).

Table 5. OLS Regression Analyses of Loneliness

	September 2019 Survey			March 2020 Survey		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Platform worker	.315***	.223***	.224*	.305***	.236***	.236**
	(.070)	(.066)	(.093)	(.062)	(.061)	(.044)
Financial strain		.209***	.209***		.195***	.195***
		(.020)	(.021)		(.021)	(.021)
University degree	-.056	.012	.008	.003	.046	.044
	(.044)	(.043)	(.045)	(.042)	(.041)	(.044)
Platform worker X University degree	---	---	.028	---	---	.002
			(.128)			(.119)
Occupation (ref. Service)						
Professional	-.014	.015	.015	-.103	-.071	-.071
	(.058)	(.056)	(.056)	(.057)	(.056)	(.056)
Clerical	.003	.013	.013	.020	.043	.043
	(.069)	(.068)	(.068)	(.071)	(.070)	(.070)
Labor	-.070	-.033	-.033	-.076	-.059	-.059
	(.069)	(.066)	(.066)	(.065)	(.065)	(.065)
Other	.006	-.020	-.019	-.104	-.100	-.100
	(.076)	(.073)	(.073)	(.074)	(.072)	(.072)
Work hours (all jobs)	.002	.001	.001	.000	-.000	-.000
	(.001)	(.001)	(.001)	(.001)	(.001)	(.001)
Multiple jobs	.089	.063	.062	.021	.004	.004
	(.055)	(.054)	(.055)	(.051)	(.050)	(.050)
Permanent employee	.002	.002	.000	-.058	-.029	-.029
	(.055)	(.053)	(.021)	(.050)	(.049)	(.049)
Household income (ref. <$25,000)						
$25,000-$49,999	-.027	-.001	-.001	-.049	-.037	-.037
	(.124)	(.020)	(.122)	(.097)	(.097)	(.097)
$50,000-$99,999	-.076	.014	.015	-.187*	-.118	-.118
	(.120)	(.119)	(.119)	(.090)	(.090)	(.090)

Table 5 continued on next page

Table 5 Continued	September 2019 Survey			March 2020 Survey		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
$100,000-149,999	-.170	-.046	-.045	-.231*	-.101	-.101
	(.125)	(.125)	(.125)	(.096)	(.096)	(.095)
$150,000+	-.208	-.011	-.011	.291**	-.126	-.126
	(.131)	(.132)	(.132)	(.100)	(.100)	(.100)
Missing income	-.148	.002	.002	-.108	-.020	-.020
	(.129)	(.129)	(.129)	(.105)	(.104)	(.104)
Age	-.014***	-.014***	-.014***	-.012***	-.012***	-.012***
	(.002)	(.001)	(.001)	(.002)	(.001)	(.001)
Women	.032	.017	.018	.032	.003	.003
	(.041)	(.042)	(.042)	(.041)	(.040)	(.040)
Visible minority	.173**	.151*	.151*	.210***	.193***	.193***
	(.063)	(.061)	(.061)	(.057)	(.055)	(.055)
Cohabitating or married (ref. single)	-.349***	-.331***	-.331***	-.320***	-.307***	-.308***
	(.049)	(.048)	(.048)	(.047)	(.046)	(.046)
Children in the household	.070	.019	.019	-.015	-.068	-.068
	(.044)	(.043)	(.044)	(.042)	(.042)	(.042)
Constant	2.551	1.901	1.982	2.715	2.186	2.186
R-square	.156	.187	.187	.144	.182	.182

Notes: 2019 Sample: N=2,460; 2020 Sample: N=2,469
Standard errors presented in parentheses
*p < 0.05, **p < 0.01, ***p < 0.001 (two-tailed).