Basic psychological need satisfaction and well-being for gig workers: a fuzzy set QCA approach in DiDi of China

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Abstract

With the rapid development of the gig economy, the psychological needs of gig workers have gradually attracted attention. The purpose of the study is to explore the relationship between basic psychological need and well-being. Fuzzy-set qualitative comparative analysis (fsQCA) was used to analyze questionnaire data from a sample of 422 DiDi drivers in China. The results show that there are altogether 10 basic psychological need satisfaction combination configurations to improve the well-being of gig workers. In general, Chinese gig workers pay more attention to whether respect and recognition, and occupational planning are met. This study contributes to the literature of basic psychological need and gig workers’ well-being in the Chinese context. In the analysis of asymmetric relationship, it has some noticeable advantages, because it allows to explore how basic psychological needs are combined with the necessary and sufficient conditions, so as to form the basis for the well-being of gig workers. It represents a promising new direction for gig workers’ well-being.

Keywords  Basic psychological need · Chinese DiDi drivers · fsQCA · Gig work · Self-determination theory · Well-being

Introduction

The pursuit of well-being has always been the eternal and universal pursuit of human beings. There is sufficient evidence to show that improving workplace well-being can make employees more productive, more engaged, less alienated and more satisfied with their jobs. The rise of the digital platform economy has led to a growing number of employers abandoning fixed schedules in favor of on-demand, just-in-time, and gig work. In the West, the well-being of employees in the organization has been paid more attention by managers and scholars in the past decades (Robertson & Cooper, 2010). In China, academic research in the area of employees’ well-being still lags behind the needs of organizations (Zheng et al., 2015). Traditional management ideas and methods have been insufficient in improving employees’ well-being. Therefore, gig workers’ well-being in organizations should attract increased attention from both academics and managers.

However, the current gig market is still focused on ways to improve the organization’s bottom line, while the focus on the psychological health of gig workers is secondary. With the rise of the gig economy, the human resource allocation model has gradually shifted from “enterprise-employee” to “platform-individual”, resulting in a more flexible and free working mode (Mulcahy, 2016). Although employment flexibility has improved the work-life balance, it has increased the instability of employment (Thor et al., 2019). Gig workers are excluded from the labor protection provided for employees. Their precarious status is becoming increasingly evident in the COVID-19 crisis (Apouey et al., 2020). Providing services through Uber is the most common type of gig economy activity. However, the income of gig work only accounts for a small part of the total income of gig workers, because only 8% of the people think that this part of the income is their main source of income (Apouey et al., 2020). The fact that many Uber drivers may have selected into a flexible work arrangement to gain greater autonomy over their working hours suggests that such dimensions might affect their well-being (Thor et al., 2019). There have been a lot of studies on the relationship between basic psychological need and well-being (Milyavskaya & Koestner, 2011).
but most of them are in the context of Western countries, and there are few attempts in collectivist society such as in China. It is necessary to explore the relationship between basic psychological need and well-being at work in the Chinese context, especially the research on gig workers like DiDi drivers, which is more in line with the management needs of digital platform enterprises. Uber drivers, as an important group of the gig economy, have much in common with Chinese DiDi drivers in their gig job characteristics. As we said, both employees and platforms will benefit when better career choices are developed. It’s counterintuitive that gig work platforms have a vested interest in attracting and retaining enough works to ensure that they remain attractive to customers, which ensures the long-term viability of these platforms (Rockmann & Ballinger, 2017). However, no research has looked at the relationship between basic psychological need and well-being in the gig economy, or the underlying mechanism of this relationship.

The purpose of this paper is to explore the satisfaction of basic psychological needs to improve the well-being of gig workers. We have contributed to the literature on the well-being of gig workers by going beyond the “all or nothing” association assumed by traditional statistical models (such as multiple regression analysis or structural equation model). Therefore, we try to provide different perspectives of each dimension of basic psychological needs related to employee well-being to supplement the previous research using regression analysis. Specifically, our study verified the reliability and validity of the basic psychological need scale in the workplace based on the Chinese context again.

The rest of the paper is structured as follows. The second section introduces the relevant literature review on basic psychological needs and well-being of gig workers, and shows the relationship between basic psychological needs and well-being based on self-determination theory, and puts forward research hypotheses. The third section presents the study design, including the data collection process, variable measurement, reliability and validity analysis, and correlation analysis. The fourth section analyzes the data, including variables calibration, necessity analysis, and sufficiency analysis, as well as specific casual configurations analysis. The discussion in the fifth section includes theoretical implications, practical implications, and limitations. The sixth section is conclusion.

**Literature review and hypotheses**

**Well-being of gig workers**

In recent years, due to the proposal of positive psychology and positive organizational behavior, the study of well-being has been extended to the field of management science and organizational behavior, and the study of workplace well-being has received extensive attention. In the beginning, some scholars defined employee well-being only as a kind of psychological and health state at work and measured it by related concepts such as job satisfaction, job burnout, emotional exhaustion, or job stress (Kausto et al., 2005; Wright et al., 2002). And other scholars think that the previous definition lacks attention to the emotional part of work, so they use positive emotion and negative emotion to measure well-being (Schaufeli & Bakker, 2004). Subsequently, some scholars argue that the definition of employee well-being is too narrow to focus only on the status of work, but also on all psychological feelings and health status of non-work (Diener & Ryan, 2009). There is ample evidence showing that workplace well-being ensures the achievement of the individual goals of members of an organization and is the best way to improve the performance of individuals and organizations (Wright & Cropanzano, 2004). Most of the most productive time when people are awake is spent on paid work. Therefore, workplace well-being probably plays an important role in their life satisfaction and happiness. Some scholars even regard workplace well-being as employees’ well-being (Ip, 2009). But there is a large literature on workplace well-being in the forms of quality of work-life or job satisfaction research (Warr, 1999; Zheng et al., 2015) based on the perspective of integration, putting forward employee well-being is not only the employees’ cognition and perception of satisfaction in work and life, and the emotional psychological experience and satisfaction state expressed at the work level and the non-work level mainly includes the three aspects of employees’ life well-being, workplace well-being, and psychological well-being. As the boundary between the life and work of gig workers is ambiguous, we used the definition of well-being which is proposed by Zheng et al. It includes not only job satisfaction but also the positive emotions that an individual experience regarding work.

The rise of the gig economy has broken the traditional employment relationship, and the relationship between inside and outside the organization is getting closer and closer. In addition, the prevalence of the mobile Internet makes the boundary between work and life more ambiguous, and the changes and uncertainties of the overall environment bring new challenges to the improvement of gig workers’ well-being. However, no matter in the traditional organizational structure or the context of the Internet era, well-being at work is a very important factor affecting the physical and mental health and career development of individuals. On the one hand, the recognition of the individual value and the enhancement of job autonomy under the new economic model is conducive to the improvement of well-being. On the other hand, due to the periodicity and substitutability of temporary work, economic insecurity, future uncertainty and lack of stable interpersonal support have become the
main problems affecting the well-being in the workplace (Torres, 2018). However, more and more studies show that, in addition to money compensation, how a wide range of job characteristics affect individual subjective well-being (De Neve & Ward, 2017). At present, the study on the well-being of gig workers is still in the exploratory stage. Thor et al. (2019) explored the rise of the so-called gig economy through the lens of Uber and its drivers in the U.K. They provide enlightenment evidence that drivers who emphasize flexibility as an important motivation to join Uber also report higher levels of subjective well-being. Work motivation has become a starting point to explore the well-being of gig workers. According to the principle of motivation generated by needs, this study takes the satisfaction of basic psychological need as the source of the well-being of gig workers.

2.2 Basic psychological need

The concept of basic psychological need was put forward by American psychologists Ryan and Deci in 2000. They point out that there is a universal need within human beings to pursue their development. The need is innate and runs through life. It is to people what water, minerals, and sunlight are to plants to thrive (Ryan, 1995). Meeting this need can promote the healthy growth of individual personality and cognitive structure, and can predict, motivate and guide individual behavior (Deci & Ryan, 2000; Broeck et al., 2010) applied basic psychological need to the workplace and divided them into three dimensions: relatedness, autonomy, and competence. Relatedness need refers to the desire to establish a relationship of mutual respect and trust with others. In other words, an individual tends to connect with others, aspire to be part of a group, to love, care, beloved, and be cared for (Baumeister & Leary, 1995). The need for autonomy refers to the need for self-determination, that is, the need for individuals to act of their own will. Autonomy represents the individual’s inner will and desire to experience a sense of choice and psychological freedom when carrying out activities (De Charms, 1968; Deci & Ryan, 2000). Competence need is defined as the internal desire of an individual to feel effective in interaction with the environment (Deci & Ryan, 2000). In other words, competence need refers to individuals’ belief that their behavior or actions can reach a certain level and their belief that they are competent for this activity.

Although the concept and dimension of basic psychological need in the workplace have been well applied in Western theoretical research and management practice, some scholars have questioned the cross-cultural universality of basic psychological need (Vlachopoulos et al., 2013). Chinese scholars Zhao and Fu (2017) found that the basic psychological need of the Chinese workplace is composed of three second-order factors: relatedness need, autonomy need, and occupation need. The competence needs contained in the basic psychological need of the Western workplace do not enter the most important basic psychological need of Chinese employees. In the Chinese workplace, the possible reason that competence need do not enter the scope of basic psychological need of the workplace is that for the career development of employees, the role of relationship is more than ability. The dimension of relatedness need includes three sub-dimensions: the need for respect and recognition, the need for harmony, and the need for justice. The need for harmony is similar to the need for Western relatedness, while the need for respect and recognition and the need for justice fully reflect the unique social culture of China. The strong need for justice stems from the Pattern of Difference Sequence proposed by Xiaotong Fei. China is a society that stresses the law of human relations. People treat others according to the principle of relations (Luo, 2012). Autonomy need are embodied in two aspects: work characteristics and interactive way. The need for work characteristics refers to the desire for the organization to ensure that the position has certain autonomy through rules and regulations and job design. The need for an interactive way means that the superior’s leadership style is expected to make subordinates feel more autonomous in their work. Occupation need shows that Chinese employees attach great importance to occupation and expect its stability, which consists of two sub-dimensions: occupational safety and occupational planning. Chinese employees’ occupation need are mainly because China has been in an agricultural civilization for a long time. The small-scale peasant economy has generated defensive national psychology that refuses to take risks, rejects uncertainty, and pursues stability (Huang, 2007). Our research object is DiDi drivers in China, so we use the basic psychological needs scale developed by Chinese scholars Zhao and Fu (2017) based on the Chinese scenario to measure the gig workers. The research objects of this study are DiDi drivers in China. Therefore, the basic psychological need construct revised by Zhao and Fu (2017) was adopted to measure the psychological satisfaction of DiDi drivers at work.

2.3 Analytical framework based on SDT

Self-determination theory (SDT) is an empirical theory of human motivation, development and health. The theory focuses on the types of motivation, not just the quantity, especially on autonomous motivation, control motivation and amotivation as predictors of performance, relationship and well-being outcomes (Deci & Ryan, 2008; Weinstein & Ryan, 2010; Walker & Kono, 2018). For decades, SDT has been concerned with the relationship between motivation and the dual concerns of organizational performance and health. It focuses on what promotes high-quality, sustainable
The theory of basic psychological need is a subtheory of self-determination theory (Nagpal & Pang, 2016). Many recent theoretical and empirical studies on SDT have focused on basic psychological need as organizational principles (Vansteenkiste & Ryan, 2013). SDT believes that people’s pursuit and realization of valuable results depend on the extent to which their basic psychological need can be met, and when these needs are met, the optimal well-being results will be achieved (Deci & Ryan, 2000). Therefore, we assume that there is a positive effect between the basic psychological need of Chinese employees and the sense of well-being at work.

Then, we propose hypothesis H1: Distinct configurations of causal conditions (respect and recognition, harmony, justice, work characteristics, interactive way, occupational safety, and occupational planning) are equifinal in achieving high gig workers’ well-being.

The emergence of the gig economy represents a new form of contingent labor (Harris, 2017). According to the nature of gig jobs, we can see that many workers are attracted by the flexibility and autonomy of gig economy. However, scholars emphasize that independent work arrangements are also accompanied by instability. Digital platforms seem to offer an alternative to some aspects of precarity, helping employees find jobs consistently and securely (Sutherland et al., 2020). Recent research reports show that some application workers feel exploited by the organization because they have little input into the way work is assigned or completed (Wood et al., 2019). Therefore, the morale and well-being of employees will undoubtedly decrease (Fleming, 2017). Working arrangements are becoming more and more precarious, and independent contracting and temporary work are becoming more and more common (Harvey et al., 2017). But the gig economy is not well managed, and DiDi drivers need to maintain good ratings -- every ride-hailing customer remembers drivers pleading for “five-star praise.” DiDi drivers are even more vulnerable to the platform’s scoring system. Based on the platform-dependent (Duggan et al., 2020) and unstable nature (Kost et al., 2020) of gig work, we hypothesize that gig workers are more concerned about being respected and recognized at work and the sustainability of gig work.

Therefore, we propose hypothesis H2: Respect and recognition and occupational planning dimensions in different combinations are sufficient to predict high gig workers’ well-being, but each one alone is not sufficient because well-being is influenced by different basic psychological need dimensions.

Methods

This study extends the research by investigating how DiDi drivers can achieve high well-being through basic psychological need by testing different configurations of its dimensions. In addition, based on the literature of fsQCA, it highlights the unique information compared with traditional correlation methods, and shows the advantages of this method in understanding causality (Fiss, 2011). This method has some strong advantages in analyzing work-related basic psychological need, because it allows the research factors to combine into the necessary and sufficient conditions to form the results (Rihoux & Ragin, 2009).

Data collection

In this study, we surveyed a group of DiDi drivers in China. In order to improve the representativeness of the sample, we randomly sampled DiDi drivers across the country from April to May 2019 through the Questionnaire Star platform. A total of 573 questionnaires were obtained by self-report, 422 valid questionnaires were obtained by systematically excluding those that did not meet the requirements and those with missing answers, and the questionnaire recovery rate reached 73.6%. Of the 422 respondents, 65.9% were males and 34.1% were females; 87.5% are between 24 and 39 years old; 58.5% have a bachelor degree or above; 88.4% have joined the DiDi platform for more than one year, and 48.6% are full-time drivers, 51.4% are part-time drivers. According to the sample statistics, the working hours of full-time drivers are about 47.3 h a week, while that of part-time drivers is 18.5 h a week. The samples are mainly distributed in Guangzhou, Beijing, and Shanghai, accounting for 30.6% of the total respondents.

Measures of variables

The questionnaire has three parts. The front part is an introduction to explain the research project, the importance of collaboration among respondents, and anonymous information. In the first section, participants are asked about their basic psychological need satisfaction that driving in DiDi; in the second section, respondents rate the well-being brought by the total respondents.

The questionnaire has three parts. The front part is an introduction to explain the research project, the importance of collaboration among respondents, and anonymous information. In the first section, participants are asked about their basic psychological need satisfaction that driving in DiDi; in the second section, respondents rate the well-being brought by driving at the DiDi platform; and in the third section, respondents give their demographic data. The perceptions of basic psychological need satisfaction are measured using the 36 items of work-related basic psychological need adapted by Zhao and Fu (2017) from W-BNS (Broeck et al., 2010). Well-being is measured using the EWB measurement adopted from Zheng et al. (2015), with a total of 18 items, including life well-being, workplace well-being, and psychological well-being. We measured these constructs with multiple items on a five-point Likert-type scale anchored by 1 (strongly disagree) and 5 (strongly agree). We judged the reliability of the scale through Cronbach’s alpha (α) and the combined reliability (CR), and the results showed that the α and CR of all
dimensions were exceeded the recommended cut-off point of 0.7. Secondly, we measured the convergence validity of the scale through standardized factor load and average variance extract (AVE). The results showed that only the standardized factor load of three items in respect and recognition was not exceeded 0.7, and the standardized factor load of each item of the other factors was all exceeded 0.7. Except for AVE of respect and recognition, which is slightly less than 0.5, AVE of other factors all reaches the standard of 0.5. (See Table 1).

**Confirmatory factor analysis**

Prior to testing our hypotheses, we used Mplus 7.4 to assess the convergent and discriminant validity of basic psychological need by performing a confirmatory factor analysis to examine whether these dimensions were empirically separated and captured distinct constructs. The results showed that the seven-factor model (i.e., respect and recognition, harmony, justice, work characteristics, interactive way, occupational safety, and occupational planning) fits well with the data ($\chi^2(591) = 5852.847$, $CFI = 0.936$, $RMSEA = 0.055$) and better than the three second-order factor model (i.e., relatedness need, autonomy need, and occupation need) ($\chi^2(591) = 5852.847$, $CFI = 0.936$, $RMSEA = 0.055$) better than the three and the standardized factor load of each item of the other factors was all exceeded 0.7. The first step of QCA research is to analyze the necessary conditions. According to convention, if the consistency score exceeds the threshold of 0.9, a condition or a combination of conditions is “necessary” or “almost always necessary” (Schneider et al., 2010). The study uses fsQCA 3.0 to examine the explicit connections between workplace well-being and all possible combinations of binary states (i.e., presence or absence) of its conditions (i.e., respect and recognition, harmony, justice, work characteristics, interactive way, occupational safety, and occupational planning). The advantages of qualitative comparative analysis in comparison with traditional analysis techniques are two: (1) equifinality, that is, the method identifies combinations of factors, rather than individual factors, that generate the same result; (2) asymmetry, meaning that the presence and the absence of the outcome, respectively, may require different explanations. Compared with traditional analysis methods, qualitative comparative analysis method has two advantages: (1) equality, that is, identifying the combination of factors that produce the same results, rather than a single factor; (2) asymmetry, the existence and non-existence of results, may require different interpretations (Gligor et al., 2019). When considering a small number of cases, fsQCA shows complex causal relationships such as homogeneity of configuration and accidental asymmetry. It should be noted that although QCA was initially considered as a small-N approach, recent work has undoubtedly extended QCA to large-N settings, which solves the problem of large sample size in this study (Oyemomi et al., 2016).

**Variables calibration**

Since the variables in this study are not dichotomous, we converted the variables according to Likert scale and conducted fsQCA analysis. The calibration process was conducted for continuous variables or those obtained from dimensions with various items based on three anchors between values of 0 to 1 (Villanueva et al., 2017). We calibrated all the variables included in the model and used three membership scores. Consistent with extant guidelines, the threshold for full membership was set to 0.9, the threshold for maximum ambiguity was set to 0.50 and the threshold for full non-membership was set to 0.05 (Ragin & Fiss, 2008). Table 3 shows the original values, as well as the calibration points and descriptive statistics. For the calibration process, this study used the recommendations of Alonso-Dos-Santos et al. (2018).

**Necessity analysis**

The first step of QCA research is to analyze the necessary conditions. According to convention, if the consistency score exceeds the threshold of 0.9, a condition or a combination of conditions is “necessary” or “almost always necessary” (Schneider et al., 2010). Table 4 shows the results of the necessary condition test. A causal condition is necessary if the condition must always be present (or absent) for the presence (or absence) of workplace well-being. None of the conditions is necessary for the presence and the absence of workplace well-being of DiDi drivers because they do not exceed the threshold of 0.9.

** Sufficiency analysis**

In this study, we test the sufficiency of the truth table to get the possible configuration to achieve the results. Ragin and
| Constructs and Items                                                                 | Standardized factor loadings | AVE  | α     | CR    |
|-------------------------------------------------------------------------------------|------------------------------|------|-------|-------|
| Respect and recognition (1 = strongly disagree, 5 = strongly agree)                  |                              |      |       |       |
| DiDi platform can appropriately adapt my suggestions on work.                        | 0.785                        | 0.482| 0.822 | 0.847 |
| I can be valued by the DiDi platform in my work.                                     | 0.749                        |      |       |       |
| DiDi platform never goes back on what it promised me.                                | 0.731                        |      |       |       |
| DiDi platform will ask for my opinion when making decisions about me.                | 0.646                        |      |       |       |
| I resent being abused at work.                                                       | 0.564                        |      |       |       |
| Being respected and not violating my privacy was a key factor in my selection for the job at the DiDi platform. | 0.666                        |      |       |       |
| Harmony (1 = strongly disagree, 5 = strongly agree)                                  |                              |      |       |       |
| I can pour out my troubles at work to the other DiDi drivers.                        | 0.935                        | 0.714| 0.937 | 0.937 |
| When I have a problem at DiDi, I can turn to other DiDi drivers for help.            | 0.805                        |      |       |       |
| Among DiDi drivers, I have friends with whom I get along well.                       | 0.860                        |      |       |       |
| I can confide in my DiDi driver colleagues about things in life.                     | 0.861                        |      |       |       |
| Working at the DiDi platform can give me a sense of belonging and not being alone.   | 0.774                        |      |       |       |
| I was able to get praise from my DiDi colleagues when I made an achievement.         | 0.826                        |      |       |       |
| Justice (1 = strongly disagree, 5 = strongly agree)                                  |                              |      |       |       |
| All decisions about DiDi drivers on the DiDi platform are clear and transparent.     | 0.818                        | 0.729| 0.913 | 0.915 |
| DiDi drivers have to follow the rules and have no exceptions.                       | 0.866                        |      |       |       |
| There is no privileged category of DiDi drivers.                                     | 0.876                        |      |       |       |
| DiDi platform’s reward policy applies to all DiDi drivers.                           | 0.853                        |      |       |       |
| Work characteristics (1 = strongly disagree, 5 = strongly agree)                    |                              |      |       |       |
| DiDi drivers are not forced to work overtime.                                        | 0.917                        | 0.748| 0.885 | 0.899 |
| DiDi drivers have decision-making power                                              | 0.845                        |      |       |       |
| I can do my job in my way within the limits of the policy.                           | 0.830                        |      |       |       |
| Interactive way (1 = strongly disagree, 5 = strongly agree)                          |                              |      |       |       |
| I can carry out my work freely without fear of being monitored everywhere.           | 0.902                        | 0.701| 0.932 | 0.921 |
| The DiDi platform will not interfere too much with the progress of my work.         | 0.867                        |      |       |       |
| I have some voice and autonomy in the tasks assigned by the DiDi platform.           | 0.830                        |      |       |       |
| DiDi drivers are not required to follow a fixed behavior pattern when allocating orders on the DiDi platform. | 0.809                        |      |       |       |
| DiDi platform does not dictate every step of getting the job done.                   | 0.772                        |      |       |       |
| Occupational safety (1 = strongly disagree, 5 = strongly agree)                     |                              |      |       |       |
| Constructs and Items                                                                 | Standardized factor loadings | AVE   | α     | CR  |
|-------------------------------------------------------------------------------------|------------------------------|-------|-------|-----|
| Being a DiDi driver is a stable job and does not usually lead to sudden dismissal. | 0.933                        | 0.678 | 0.932 | 0.926 |
| I don’t have to worry about losing my job at the DiDi platform.                   | 0.854                        |       |       |     |
| My ability always enables me to find a job like a DiDi driver.                    | 0.745                        |       |       |     |
| The job at DiDi is stable, and I’m satisfied with that.                           | 0.794                        |       |       |     |
| I can work at the DiDi platform all the time.                                     | 0.813                        |       |       |     |
| DiDi platform promised me that I could stay in this job for a long time.          | 0.789                        |       |       |     |
| Occupational planning (1 = strongly disagree, 5 = strongly agree)                 |                              |       |       |     |
| I know my career development path working on the DiDi platform.                   | 0.906                        | 0.679 | 0.932 | 0.927 |
| I have a sound career development channel on the DiDi platform.                   | 0.846                        |       |       |     |
| My job at the DiDi platform is repetitive every day, which makes it impossible for me to see the prospect of my job. (Reverse) | 0.834                        |       |       |     |
| I am confused every day, and I don’t know whether the job at the DiDi platform is conducive to my future job choice. (Reverse) | 0.799                        |       |       |     |
| My current job at the DiDi platform could be a springboard for my future job.     | 0.763                        |       |       |     |
| I am very clear about the skills I need to master and the skills I will learn as a DiDi driver. | 0.789                        |       |       |     |
| DiDi Drivers’ well-being (1 = strongly disagree, 5 = strongly agree)             |                              |       |       |     |
| I feel satisfied with my life.                                                   | 0.879                        | 0.801 | 0.948 | 0.960 |
| I am close to my dream in most aspects of my life.                               | 0.843                        |       |       |     |
| Most of the time, I do feel real happiness.                                      | 0.933                        |       |       |     |
| I am in a good living situation.                                                 | 0.924                        |       |       |     |
| My life is very fun.                                                             | 0.928                        |       |       |     |
| I would hardly change my current way of life in the afterlife.                   | 0.859                        |       |       |     |
| I am satisfied with my work responsibilities.                                   | 0.908                        | 0.723 | 0.934 | 0.940 |
| In general, I feel fairly satisfied with my present job.                         | 0.873                        |       |       |     |
| I find real enjoyment in my work.                                                | 0.802                        |       |       |     |
| I can always find ways to enrich my work.                                       | 0.887                        |       |       |     |
| Work is a meaningful experience for me.                                         | 0.792                        |       |       |     |
| I feel satisfied with my work achievements in my current job.                   | 0.834                        |       |       |     |
| I feel I have grown as a person.                                                | 0.710                        | 0.743 | 0.936 | 0.945 |
| I handle daily affairs well.                                                     | 0.841                        |       |       |     |
| I generally feel good about myself, and I’m confident.                           | 0.940                        |       |       |     |
| People think I am willing to give and to share my time with others.              | 0.872                        |       |       |     |
| I am good at making flexible timetables for my work.                             | 0.881                        |       |       |     |
| I love having deep conversations with family and friends so that we can better understand each other. | 0.908 |       |       |     |
Fiss (2008) and Kraus et al. (2018) proposed that the value of “1” should be used as the threshold for the frequency of medium-sized samples (e.g., 10–50 cases). Our sample is large, so we chose a frequency threshold of 2 observations and a consistency threshold of 0.90, which means that only those configurations with more than one case are empirically relevant.

The following sections show the possible causal configurations leading to workplace well-being. These solutions contain all the logical remainder, which leads to the existence of results according to the literature (Ragin, 2008). FsQCA analysis produces three possible solutions: complex solution, intermediate solution, and parsimonious solution (Fiss, 2011). Table 5 gives the intermediate solution of the result.

**Analysis of the outcome variable: well-being**

Intermediate solution: \( \text{fs}_\text{well-being} = f(\text{fs}_\text{respect and recognition}, \text{fs}_\text{harmony}, \text{fs}_\text{justice}, \text{fs}_\text{work characteristics}, \text{fs}_\text{interactive way}, \text{fs}_\text{occupational safety}, \text{fs}_\text{occupational planning}) \).

This model presents 10 causal configurations that lead to DiDi drivers’ well-being (see Table 5). These 10 configurations show a consistency score exceeding 0.80, which means that they are sufficient to produce the outcome. All of the conditions are relevant conditions because they appear in more than 5 of the 10 configurations. Following Ragin (2008), the study analyzes 3 causal configurations with high raw coverage and unique coverage. This is because higher coverage values indicate greater empirical correlation.

Respect and recognition*Justice*Interactive way*Occupational planning. (Raw coverage = 0.433; Unique coverage = 0.023; Consistency = 0.862).

Solution 1 indicates that when respect and recognition, justice, interactive way, and occupational planning are present, DiDi drivers indicate high well-being irrespective of the satisfaction of harmony, work characteristics, and occupational safety. From the combination above emerges that DiDi drivers with a high level of respect and recognition, justice, interactive way, and occupational planning present a higher level of well-being in 43.3% of the cases.

Respect and recognition*Harmony*Interactive way*Occupational safety*Occupational planning. (Raw coverage = 0.381; Unique coverage = 0.013; Consistency = 0.885).

Solution 4 indicates that when respect and recognition, harmony, justice, occupational safety, and occupational planning are present, DiDi drivers indicate high well-being irrespective of the satisfaction of work characteristics and interactive way. From the combination above emerges that DiDi drivers with a high level of respect and recognition, harmony, justice, occupational safety, and occupational planning present a higher level of well-being in 38.1% of the cases.

Respect and recognition*Harmony*Interactive way*Occupational safety*Occupational planning. (Raw coverage = 0.378; Unique coverage = 0.011; Consistency = 0.885).

Solution 6 indicates that when respect and recognition, harmony, interactive way, occupational safety, and occupational planning are present, DiDi drivers indicate high workplace well-being irrespective of the satisfaction of justice and work characteristics. From the combination above emerges that DiDi drivers with a high level of respect and recognition, harmony, interactive way, occupational safety, and occupational planning present a higher level of well-being in 37.8% of the cases.

Interestingly, in all these 3 solutions, it indicates that work characteristics is a ‘do not care’ condition but it appears in 6 of the 10 configurations. This indicates that the work characteristics of job autonomy play an important role in improving the well-being of gig workers, but it is not the key factor. Solution 1 has the highest raw coverage (i.e., 0.433) indicating that this solution is the best representation of workplace well-being, followed by Solution 4 (i.e., 0.381) and Solution 6 (i.e., 0.378). Concerning the coverage, the findings indicate an overall solution coverage of 0.613 and an overall consistency of 0.836, suggesting that a substantial proportion of the outcome is covered by the 10 configurations.

**Discussion**

This study seeks to identify the specific work-related basic psychological need dimensions that relate to DiDi drivers’ well-being. The results showed that both H1 and H2 were supported. The analysis of necessary conditions shows that none of the dimensions of basic psychological need is necessary to generate well-being. Furthermore, sufficient condition analysis reveals different possible combinations of basic psychological needs dimensions related to DiDi drivers’ well-being. Thus, the results show that DiDi drivers presenting well-being are those whose basic psychological need are met. It should be noted that the coverage and consistency of the three solutions obtained in this study are relatively high. In regards to the results of the fsQCA analysis, the conditional causal model explained 61.3% of the well-being. The most important conditions of the 10 configurations show that the most important dimensions were respect and recognition, justice, interactive way, and occupational planning. Combine the conditions that occur in all the configurations, the most important dimensions are respect and recognition and occupational planning, but the others matter too.
Theoretical implications

These findings make several key theoretical contributions to the literature of basic psychological need and gig workers’ well-being in the Chinese context. First, this paper expands the scope of basic psychological need fulfillment in the context of China’s gig economy. Previous studies have empirically examined the relationship between basic psychological need and workplace well-being (León & Núñez, 2013). They examined some dimensions that must be present for workplace well-being to occur, such as autonomy (Rudy et al., 2007), competence (Pillay et al., 2005), and relatedness (King, 2015). We expand on this body of literature that leads to gig workers’ well-being by also empirically examining the role of basic psychological need dimensions under the Chinese context. Basic psychological need dimensions (i.e., respect and recognition, harmony, justice, work characteristics, interactive way, occupational safety, and occupational planning) revised according to the Chinese context still include the connotation of autonomy and relatedness, but not competence. On this basis, we explore the influence factor combination configurations of the basic psychological need dimensions in the revised scale on the well-being of gig workers in the Chinese context. Second, the most important basic psychological need factors affecting the well-being of Chinese gig workers are found, which are respect and recognition, and occupational planning respectively. Previous studies have explored the impact of workplace bullying on happiness in different contexts based on psychological contract and self-determination theory (Sischka et al., 2021), often ignoring the impact of lack of respect and recognition at work on well-being. Especially when the health and safety of gig workers is otherwise poorly protected (Ballard, 2021). However, in traditional organizational work, the positive impact of respect and recognition on the organization has been confirmed (Clarke & Mahadi, 2017; Węziak-Białowolska et al., 2019). The results of this study complement the individual needs for respect and recognition in the context of the gig economy and further identify the need to study the impact of respect and recognition on well-being. The need to be respected comes from the hierarchy and order in Chinese Confucianism, which stresses the distinction between the superior and the inferior, the order between the elder and the younger, and the politeness between the superior and the subordinate in terms of power and status (Huang, 2007). Therefore, the paternalistic leadership style prevails in Chinese organizations (Duan, 2012). With the introduction and recognition of Western civilization and values, China’s opening up and exchanges with the West have been further expanded, and the social and economic structure, cultural forms, and values are undergoing profound changes. In particular, the rise of the gig economy has unleashed people’s individuality and enhanced their value, awakening their pent-up need for respect and recognition. Employment relations in China have changed dramatically: long-term, stable “iron rice bowls” are increasingly scarce, and jobs with high uncertainty and competitive pressures are becoming more mainstream. The conflict between reality and ideal has triggered a strong need for occupation stability among gig workers, who look to the organizations they work for to provide systematic, forward-looking occupational planning to clarify and control their career development.

Practical implications

Our findings carry several practical implications for improving gig workers’ well-being. The satisfaction of basic psychological need is no longer limited to meeting autonomy, relatedness, and competence. For gig workers in China, respect and recognition and occupational planning are two robust communication tools to improve gig workers’ well-being. In terms of macro policies, the state should popularize the public’s understanding of various emerging professions and guide the public to understand and respect each one. From the perspective of the platform, gig workers often exchange values through the platform, so the platform should open up channels for gig workers to give feedback, to optimize the design and operation of the platform. In addition, the platform should adopt the credit investigation method of two-way scoring, while protecting the complaint channel of both consumers and service providers. From the perspective of gig workers themselves, it is necessary to have a correct view of their work and make a good career plan. If they can combine their strengths into gig works, bring out new ideas, innovate services, and be clear about the skills they need to master and the wealth they can reap, they can greatly improve their well-being in gig works. With the improvement of gig workers’ well-being, the quality of their service will naturally become better.

Limitations and implications for future research

This study has limitations. Although we selected the scale based on the Chinese context and conducted a reliability and validity test, the development process of the scale was not targeted at the characteristics of gig workers, so the exploration of the basic psychological need of gig workers needs to be further improved. This study only explores the relationship between satisfaction of basic psychological need and DiDi drivers’ well-being at work but does not explore the specific role of basic psychological need and well-being. Future studies can combine regression statistics to analyze the specific variable relationship. In addition, it is far from enough for us to just take DiDi drivers as the representatives of gig workers. Future studies can explore more gig job types and compare the results of studies on
Table 2  Correlations among the seven dimensions of basic psychological need

| Dimension              | Mean | SD    | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|------------------------|------|-------|-----|-----|-----|-----|-----|-----|-----|
| Respect and recognition| 3.989| 0.566 | 1   |     |     |     |     |     |     |
| Harmony                | 3.675| 0.941 | 0.303** | 1   |     |     |     |     |     |
| Justice                | 3.898| 0.929 | 0.338** | 0.132** | 1   |     |     |     |     |
| Work characteristics   | 4.059| 0.889 | 0.182** | 0.213** | 0.199** | 1   |     |     |     |
| Interactive way        | 3.313| 0.996 | 0.282** | 0.327** | 0.274** | 0.295** | 1   |     |     |
| Occupational safety    | 3.763| 0.945 | 0.301** | 0.223** | 0.298** | 0.324** | 0.413** | 1   |     |
| Occupational planning  | 3.680| 0.889 | 0.375** | 0.328** | 0.311** | 0.185** | 0.321** | 0.320** | 1   |

Numbers are Pearson correlations; ** are significant at $p < 0.01$ (2-tailed). The correlations are only shown below the diagonal.

Table 3  Summary for independent variables (conditions) and outcome

|                          | Respect and recognition | Harmony | Justice | Work characteristics | Interactive way | Occupational safety | Occupational planning | Well-being |
|--------------------------|-------------------------|---------|---------|----------------------|-----------------|---------------------|------------------------|------------|
| N Valid                  | 422                     | 422     | 422     | 422                  | 422             | 422                 | 422                    | 422        |
| N Missing                | 0                       | 0       | 0       | 0                    | 0               | 0                   | 0                       | 0          |
| Mean                     | 3.989                   | 3.675   | 3.898   | 4.059                | 3.313           | 3.763               | 3.680                  | 3.560      |
| SD                       | 0.566                   | 0.941   | 0.929   | 0.889                | 0.996           | 0.945               | 0.889                  | 0.524      |
| Min                      | 2.17                    | 1.00    | 1.50    | 1.33                 | 1.00            | 1.00                | 1.00                   | 1.89       |
| Max                      | 4.83                    | 5.00    | 5.00    | 5.00                 | 5.00            | 5.00                | 5.00                   | 4.72       |

Calibration values

| Percentile 5  | 2.692 | 1.858 | 2.000 | 2.333 | 1.800 | 2.000 | 2.000 | 2.556 |
| Median        | 4.167 | 4.000 | 4.250 | 4.333 | 3.200 | 4.000 | 3.917 | 3.611 |
| Percentile 95 | 4.667 | 4.833 | 5.000 | 5.000 | 5.000 | 5.000 | 4.833 | 4.278 |

Table 4  Necessary conditions from fsQCA for respect and recognition, harmony, justice, work characteristics, interactive way, occupational safety, and occupational planning, for the occurrence (and no occurrence) of well-being

| Conditions tested | Well-being | ~ Well-being |
|-------------------|------------|--------------|
|                   | Consistency | Coverage | Consistency | Coverage |
| Respect and recognition | 0.731 | 0.727 | 0.564 | 0.621 |
| ~ Respect and recognition | 0.619 | 0.562 | 0.752 | 0.756 |
| Harmony | 0.721 | 0.684 | 0.569 | 0.598 |
| ~Harmony | 0.576 | 0.547 | 0.699 | 0.735 |
| Justice | 0.715 | 0.682 | 0.570 | 0.602 |
| ~Justice | 0.548 | 0.550 | 0.698 | 0.731 |
| Work characteristics | 0.672 | 0.664 | 0.569 | 0.623 |
| ~Work characteristics | 0.619 | 0.565 | 0.693 | 0.700 |
| Interactive way | 0.700 | 0.677 | 0.577 | 0.618 |
| ~Interactive way | 0.605 | 0.564 | 0.699 | 0.721 |
| Occupational safety | 0.700 | 0.678 | 0.591 | 0.633 |
| ~Occupational safety | 0.621 | 0.578 | 0.699 | 0.721 |
| Occupational planning | 0.743 | 0.707 | 0.564 | 0.595 |
| ~Occupational planning | 0.574 | 0.543 | 0.722 | 0.756 |

different types. In addition to focusing on the comparison of the results of this study with different samples, the control role of demographic variables such as gender and the nature of work (full-time or part-time) should also be considered.

Conclusion

The Covid-19 pandemic inevitably led to an explosion in the use of digital technology due to norms of social
isolation and a nationwide blockade (De’ et al., 2020). People and organizations around the world have had to adapt to new ways of working and living. The gig economy, which thrived in the pandemic, will become a modern economic model with sustainable development. As an important component of the sharing economy, the gig economy is a new form of human resources distribution. However, most of the media coverage has focused on the impact of the Covid-19 pandemic on changes in the working arrangements of workers with regular employment relationships, such as short-time working, flexible working locations and working hours (Spurk & Straub, 2020). The purpose of this study is to improve the well-being of gig workers and to explore the influence of basic psychological need satisfaction on the well-being of gig workers. This study adopts the scale in the Chinese context and takes the typical gig workers in China (i.e., DiDi drivers) as the research object. The study finds that the most important basic psychological need to improve the well-being of DiDi drivers are the combination configuration of respect and recognition, justice, interactive way, and occupational planning. Combined with the results of several combination configurations, we find that respect and recognition and occupational planning are the key factors to improve the well-being of gig workers. Therefore, for the gig platforms, it is important to consider how to meet the two basic psychological need of gig workers in the process of developing and designing the working mode of the platform.

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Data availability The datasets generated during and/or analyzed during the current study are not publicly available because some results are yet to be published but are available from the corresponding author on reasonable request.

Declarations

Ethical statement The Human Research Ethics committee of the corresponding author’s university has confirmed that no ethical approval is required.

Informed consent Informed consent was obtained from all individual participants included in the study.

Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

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