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ADAPTATION AND VALIDATION OF SELF-REPORT JOB PRECARIOUSNESS SCALE FOR BRAZILIAN GIG WORK CONTEXT

Adaptação e validação da escala de autorrelato de precariedade no trabalho para o contexto brasileiro de trabalho independente

Adaptación y validación de la escala de autoinforme de precariedad laboral al contexto brasileño del trabajo gig

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ABSTRACT

The research intended to adapt and validate the self-report job precariousness scale for the Brazilian gig work context and to investigate the association of the dimensions of job precariousness with gig workers' subjective experiences and work outcomes. Exploratory and confirmatory factor analyses were conducted on a sample of 504 Brazilian gig workers. In addition, zero-order correlations were performed on a sample of 304 Brazilian gig workers for criterion validity analysis. Results supported a four-factor structure and the bi-factor model, reinforcing the assumption that the job precarious scale is a multidimensional measure with a hierarchical structure. Reliability analysis (Alpha coefficient and bifactor indices) indicates that the scale presented adequate internal consistency for all four dimensions and the full scale. Results regarding criterion validity demonstrate that job precariousness is negatively linked to well-being and positively associated with ill-being; in addition, the dimensions of job precariousness and remuneration have significative associations with all variables of work outcome investigated. This study introduces the Brazilian version of the self-report job precariousness scale with robust psychometric qualities to assess workers' perception of precarious working conditions in the Brazilian gig work context. In addition, it broadens the scope of research on precarious working conditions and their impact on psychological experiences and work outcomes.

Keywords: job precariousness, well-being, ill-being, gig work, validation.

RESUMO

A pesquisa teve como objetivo adaptar e validar a escala de autorrelato de precariedade no trabalho para o contexto brasileiro de trabalho "gig", ou trabalho independente. Análises fatoriais exploratória e confirmatória foram realizadas em uma amostra de 504 trabalhadores brasileiros. Além disso, para análise de validade de critério, foram realizadas correlações de ordem zero em uma amostra de 304 trabalhadores brasileiros. Os resultados indicam que a escala de autorrelato de precariedade no trabalho é uma medida multidimensional com estrutura hierárquica. As análises de confiabilidade indicam que a escala apresentou consistência interna adequada tanto para as quatro dimensões quanto para a escala completa. Os resultados relativos à validade de critério demonstram que a precariedade no trabalho está negativamente ligada ao bem-estar e positivamente associada ao mal-estar; além disso, as dimensões da precariedade e da remuneração do trabalho apresentam associações significativas com todas as variáveis de resultado do trabalho investigadas. Por fim, a versão brasileira da escala de autorrelato de precariedade no trabalho é um instrumento com qualidades psicométricas robustas para avaliar a percepção dos trabalhadores sobre as condições de trabalho precárias no contexto brasileiro de trabalho independente. Além disso, a escala alarga o âmbito da investigação sobre condições de trabalho precárias e o seu impacto nas experiências psicológicas e nos resultados do trabalho.

Palavras-chave: *precariedade no trabalho, bem-estar, mal-estar, trabalho gig, validação*

RESUMEN

La investigación tuvo como objetivo adaptar y validar la escala de autoinforme de precariedad laboral para el contexto brasileño del trabajo gig. Se realizaron análisis factoriales exploratorios y confirmatorios en una muestra de 504 trabajadores brasileños. Además, para el análisis de validez de criterio, se realizaron correlaciones de orden cero en una muestra de 304 trabajadores brasileños. Los resultados indican que la escala autoinforme de precariedad en el trabajo es una medida multidimensional con estructura jerárquica. Los análisis de confiabilidad indican que la escala presentó una consistencia interna adecuada tanto para las cuatro dimensiones como para la escala completa. Los resultados en cuanto a validez de criterio demuestran que la precariedad laboral está asociada negativamente con el bienestar y positivamente con el malestar. Además, las dimensiones de precariedad laboral y remuneración laboral tienen asociaciones significativas con todas las variables de resultados laborales investigadas. Finalmente, la versión brasileña de la escala de autoinforme de precariedad laboral es un instrumento con sólidas cualidades psicométricas para evaluar la percepción de los trabajadores sobre las condiciones laborales precarias en el contexto brasileño del trabajo independiente. Asimismo, amplía el alcance de la investigación sobre las condiciones laborales precarias y su impacto en las experiencias psicológicas y los resultados laborales.

Palabras clave: *precariedad laboral, bienestar, malestar, trabajo gig, validación.*

INTRODUCTION

Considered the antithesis of decent work (Allan et al., 2021), and despite the numerous definitions, job precariousness is considered a multidimensional concept to address unstable, insecure, restricted, and unsafe work conditions such as low wages, variable working hours, limited social protection and benefits, involuntary part-time work, contract or temporary work, and dangerous working conditions (Benach et al., 2014; Benach et al., 2016; Creed et al., 2020; Mullany et al., 2021).

Uncertainty is considered a key component in precarious work. It is expressed in two ways: job insecurity (i.e., worry and uncertainty about the individual's employment future) and vulnerability or inability to face unexpected events due to a lack of social power and protection (Allan et al., 2021; Bosmans et al., 2016; Hellgren et al., 1999).

When approaching and accounting for the consequences of poor working conditions on workers' health and well-being, studies have conceptualized job precariousness as a job related stressor (Ronnblad et al., 2019) that tends to increase workers' levels of stress and diminishes well-being and general functioning (Benach et al., 2014; Benach et al., 2016; Creed et al., 2020; Mullany et al., 2021). For Benach et al. (2014), precarious working conditions lead to stress, dissatisfaction, and adverse health outcomes because workers face greater demands and/or have little control over the work process.

Empirical studies have investigated the impact of several aspects of job precariousness and its association with a wide range of physical and mental health consequences. Thus, empirical studies have linked the inherent and constant uncertainty and job insecurity associated with precarious work to impact well-being and sleep quality negatively (Mai et al., 2019). In addition, meta-analytical evidence has demonstrated that job insecurity has negative effects on well-being (Sverke et al., 2002), health-related outcomes (Cheng & Chan, 2008), life satisfaction, and general mental health (Llosa-Fernández et al., 2018). On the other hand, positive relations were found between job insecurity and ill-being, such as depression, anxiety, and emotional exhaustion (Llosa-Fernández et al., 2018). Furthermore, income inadequacy, commonly associated with precarious work, has been empirically linked to poor self-rated health and quality of life among older individuals (Gildner et al., 2019). Finally, Creed et al. (2020), in a study that aimed to develop and validate the self-report job precariousness scale, found that job precariousness and its four dimensions (i.e., job conditions, job remuneration, job security, and job flexibility) are significantly associated with poorer life satisfaction, less workplace support, and more financial worries among working students.

In addition to the negative health-related and psychological consequences, job precariousness has also been associated with adverse individual and organizational work outcomes (Allan et al., 2021). Numerous studies have demonstrated both the negative effect of job insecurity and temporary work on job involvement (Sverke et al., 2002), performance (Sverke et al., 2002), organizational commitment (Cuyper et al., 2009; Sverke et al., 2002), and organizational citizenship behaviors (Feather & Rauter, 2004) and the positive effect

on workplace accidents (Jiang & Probst, 2013) and turnover intentions (Sverke et al., 2002). Furthermore, poverty wage employment, i.e., remuneration insufficient to provide a decent living, has been negatively associated with positive work-related outcomes such as meaningful work, organizational commitment, and performance, while it is positively linked to turnover intentions (Allan et al., 2017).

However, in recent years, the popularization of technology and smartphones, coupled with the increase in austerity measures and unemployment rates, gave rise to a movement that reshaped markets by creating opportunities for generating income for workers without formal employment (Bajwa et al., 2018; Stanford, 2017; Sundararajan, 2016). Considered an expansion of traditional freelance work (Donovan et al., 2016), gig work is a new form of labor organization that encompasses a huge contingent of workers with different social, educational, and occupational backgrounds (Bajwa et al., 2018; Keith et al., 2020; Manyika et al., 2016), who generate their income by providing on-demand services, usually intermediated by technology and digital platforms (Donovan et al., 2016; Meijerink & Keegan, 2019).

While the United States presents the greatest global market for gig workers, India, Indonesia, Australia, and Brazil are quickly becoming strong markets for the gig economy (Mastercard & Associates, 2019). According to data released by the Organisation for Economic Cooperation and Development (OECD), Brazil is the third country with the highest proportion of self-employed professionals in the world: there are more than 1.3 million people, representing 32.9% of the national remote workforce, a number only surpassed by Colombia (51.3%) and Greece (34.1%). In addition, although Brazilian unemployment numbers reached record numbers (14.1 million) during the COVID-19 pandemic, freelance job offers increased 43% in São Paulo, Brazil's largest metropolis (Barros, 2021). Furthermore, a study conducted by Ipea (Institute of Applied Economic Research) indicates that approximately 1.5 million Brazilian workers from the passenger and freight transport sector were engaged in the gig economy at the end of 2021. Among these workers, 61.2% were app and taxi drivers, 20.9% delivered goods via motorcycles, 14.4% worked as motorcycle taxi drivers, and the rest delivered goods via other means of transport (Góes et al., 2022). The geographical distribution of workers showed a greater concentration of delivery people via motorcycle and app driver and taxi drivers in the Southeast region, while the largest number of motorcycle taxi drivers are concentrated in the North and Northeast regions of the country.

For Watson et al. (2021), gig workers share three fundamental characteristics (Watson et al., 2021): project-based compensation, execution of temporary and fixed-term tasks, and a high level of flexibility regarding when and where work is performed. In this sense, while it is known that gig work is usually praised for offering high levels of flexibility and autonomy, some gig workers are also susceptible to precarious work conditions such as low pay, social isolation, overwork, sleep deprivation, and exhaustion (Wood et al., 2019) that can have detrimental impacts on their well-being.

Therefore, due to the high proportion of self-employed professionals and the increasing number of workers resorting to gig work to generate income in times of economic crises and

high unemployment rates, it is recommendable and plausible that research conducted with the Brazilian gig work population provides relevant insights on the dynamics of this new form of work arrangement. In this sense, under the job demands-resources model (JD-R model), job precariousness has been hypothesized as job demand associated with gig work (Keith et al., 2020) with potential detrimental effects on gig workers' psychological health and work outcomes. Thus, as gig work is often associated with unpredictable working hours, low wages, and insecurity in relation to work continuity, many authors have highlighted its precarious nature (Ashford et al., 2018; MacDonald & Giazitzoglu, 2019; Petriglieri et al., 2018).

THE STUDY

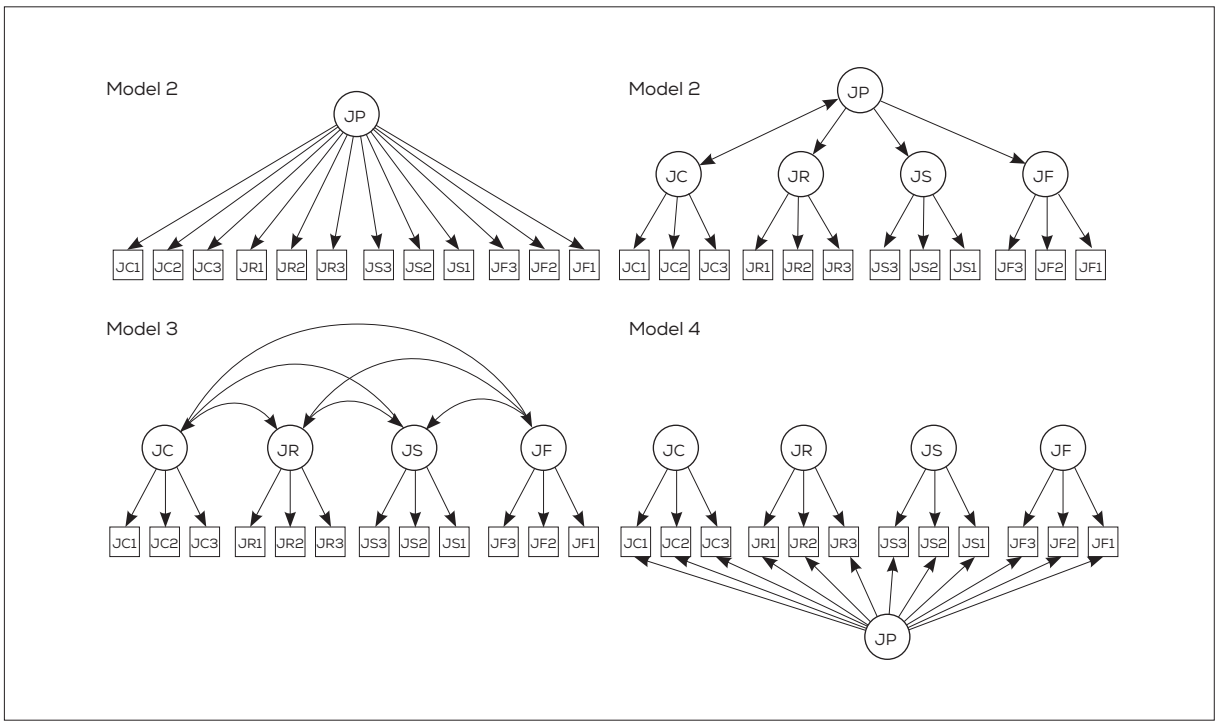
This study aimed to translate and adapt the self-report job precariousness scale (Creed et al., 2020) into the Brazilian context and test its reliability and validity among Brazilian working adults. Despite the importance of the subject for management studies, there is a scarcity of valid and reliable measures in scientific literature to assess precarious work (Creed et al., 2020; Ervasti & Virtanen, 2019; Vives et al., 2010). Studies have mostly relied on binary data (Creed et al., 2020) and a previously published measure of precarious employment – the Employment Precariousness Scale (EPRES) (Vives et al., 2010; Vives et al., 2015) – presents several psychometrical deficiencies (Creed et al., 2020). Despite these weaknesses, this instrument, first developed for the Spanish population (Vives et al., 2010), was adapted and validated to assess precarious working conditions in Greece (Tsopoki et al., 2019), Sweden (Jonsson et al., 2019), and Chile (Vives-Vergara et al., 2017). Nevertheless, despite the high informality of the Brazilian economic context, there is a lack of validated instruments in Portuguese that would support the assessment of the precarious working conditions of the Brazilian population, encompassing its multiple dimensions.

In this sense, the self-report job precariousness scale, developed by Creed et al. (2020) to measure perceived job precariousness in working students, presents good internal reliability and initial support for validity, constituting a promising tool for survey-based research to investigate the effects of job precariousness on workers. Therefore, the efforts undertaken in this study seek to fill this gap and provide valid and reliable measures that could be used further to investigate precarious working conditions in the Brazilian population. More specifically, this study aims to confirm the structure of the self-report job precariousness scale by comparing four competing models (Figure 1): (a) Model 1 – a unidimensional measure in which all 12 items load onto a single factor; (b) Model 2 – a second-order model, in which four factors (job conditions, job remuneration, job security, and job flexibility) load onto a higher level factor representing job precariousness; (c) Model 3 – four-factor model representing the dimensions of job conditions, job remuneration, job security, and job flexibility; and (d) Model 4 – a bifactor model in which all 12 items load both on one of the four factors and the general job precariousness factor.

In addition, empirical research has extensively associated job precariousness with negative consequences for workers, such as ill-being (Llosa-Fernández et al., 2018) and increased turnover

intentions (Allan et al., 2017; Sverke et al., 2002). It consistently reveals a negative correlation between job precariousness and well-being (Gildner et al., 2019; Llosa-Fernández et al., 2018; Sverke et al., 2002) while also indicating positive associations with work outcomes (Allan et al., 2017; Creed et al., 2020; Cuyper et al., 2009; Feather & Rauter, 2004; Sverke et al., 2002). Consequently, a positive relationship between job precariousness and ill-being and intentions to leave one's occupation is expected. Conversely, a negative correlation with well-being and a positive correlation with gig work outcomes, such as creativity, job satisfaction, perceived performance, and gig income, are also anticipated.

Figure 1. Hypothesized models for Self-report job precariousness scale.



Notes: JP = job precariousness; JC = job conditions; JR = job remuneration; JS = job security; JF = job flexibility.

METHOD

Sample and procedures

To collect data, surveys were distributed to Brazilian gig workers. The inclusion criteria are based on the presence of three primary characteristics of gig work described by Watson et al. (2021): (a) project-based compensation; (b) temporary nature of work; and (c) some level of flexibility in when/how/where the work is performed. Participants were recruited via social media, and participation in the study was voluntary, under a self-selection sampling technique, and anonymity was safeguarded.

In order to reduce the risk of common method variance, surveys were distributed at three different moments of time, with a two-week interval separating the measurement of dependent variables and independent variables (Podsakoff et al., 2003). Therefore, at time 1, participants responded to the self-report job precariousness scale; at time 2, questions were asked to collect data regarding the hedonic and eudemonic components of well-being and ill-being; at time 3, items addressed work outcomes. Finally, to make it possible to send the second and third parts of the survey to those who answered the first one, at time 1, participants were asked for their email addresses and to introduce an individual code that would later allow the integration of the three parts of the surveys.

Considering all data, the first wave of data collection comprised a total of 722 responses. Among them, 218 respondents were not considered for analysis (207 were removed for not matching inclusion criteria to be considered a gig worker, and 11 answers were removed due to wrong selection in "trap questions"). Thus, 504 answers for the first wave of data collection were considered valid. In the second part of the survey, a total of 363 answers were obtained (response rate of 76.4%). After excluding 12 invalid answers for not answering the "trap question" properly, 351 answers were considered valid. Finally, in the third wave of data collection, sent to 351 respondents, a total of 320 surveys were submitted (91.2% of response rate), and 304 valid submissions were obtained after excluding 16 invalid answers in the "trap question."

The self-report job precariousness scale's psychometric analysis relied on data collected in time 1, while the scale's criterion analysis was performed with data collected in time 3. Sample characterization in time 1 and time 3 is presented in Table 1.

Table 1. Sample characterization in Time 1 and Time 3.

Sample characterization		
	Time 1 (N=504)	Time 3 (N=304)
Age	M = 30.79; SD = 9.68	M = 31.20; SD = 9.75
Sex		
Female	323 (64.1%)	202 (66.4%)
Male	178 (35.3%)	99 (32.6%)
Non-binary	03 (0.6%)	03 (1.0%)
Educational level		
Elementary school	01 (0.2%)	01 (0.3%)
High school	168 (33.3%)	98 (32.2%)
Bachelor's degree	153 (30.4%)	80 (26.3%)

continue

Table 1. Sample characterization in Time 1 and Time 3. concludes

Sample characterization		
Specialization/MBA	63 (12.5%)	46 (15.1%)
Master's degree	85 (16.9%)	56 (18.4%)
PhD	34 (6.7%)	23 (7.6%)
Tenure in gig work		
<1 year	103 (22.4%)	60 (19.7%)
1–3 years	182 (36.1%)	110 (36.2%)
3–5 years	87 (17.3%)	55 (18.1%)
>5 years	132 (26.2%)	79 (26.0%)
Weekly dedication in gig work		
<10 hours	113 (22.4%)	72 (23.7%)
10–20 hours	143 (28.4%)	92 (30.3%)
20–30 hours	85 (16.9%)	52 (17.1%)
30–40 hours	85 (16.9%)	47 (15.5%)
>40 hours	78 (15.5%)	41 (13.5%)

Instruments

Perceived job precariousness

The self-report job precariousness scale was developed and validated for use with young adults who study and work by Creed et al. (2020). The scale is a 12-item self-report instrument that measures job precariousness in four dimensions, each with 3 items: job conditions (e.g., "Are you able to negotiate working conditions that better suit you?"), job security (e.g., "Are colleagues at your workplace concerned that they will lose their job in the near future?"), job remuneration (e.g., "Does your pay meet unexpected expenses?"), and job flexibility (e.g., "Are you able to take time off for a holiday or break from work without worrying about losing your job or being penalized? "). Items are rated on a 7-point Likert scale, ranging from 1 ("*Strongly disagree*") to 7 ("*Strongly agree*"). Alphas reported with working students were: job conditions (.82), job remuneration (.87), job security (.79), and job flexibility (.86) (Creed et al., 2020).

Well-being

The eudaemonic component of well-being at work was measured with the dedication dimension Utrecht Work Engagement Scale (UWES) (Schaufeli et al., 2002). Participants were asked to rate items on a 7-point Likert scale, ranging from 1 ("*Never*") to 7 ("*Always*"), indicating the frequency of the situations described in each item. Alfa was estimated at .78 in the original study (Schaufeli et al., 2002) and at .89 for the Brazilian version (Vazquez et al., 2015).

The hedonic component of well-being was measured with the positive experience dimension of the Scale of Positive and Negative Experience (SPANE) in which participants were asked to assess their positive emotional experiences (e.g., "Happy") over the previous 4 weeks on a 7-point Likert scale, ranging from 1 ("Never") to 7 ("Always"). Alfa was estimated at .87 in the original study (Diener et al., 2010) and at .89 for the Brazilian version (Silva & Caetano, 2013).

Ill-being

The "Eudemonic" aspect of ill-being was assessed with the emotional exhaustion dimension of Maslach Burnout Inventory – General Survey (MBI-GS) (Maslach et al., 1996; Maslach et al., 2001). Participants rated each item (e.g., "I feel fatigued when I get up in the morning and have to face another day on the job.") on a 7-point Likert scale, ranging from 1 ("*Never*") to 7 ("*Everyday*"). Alfa was estimated at .87 in the original study (Diener et al., 2010) and at .84 for the Brazilian version (Schuster et al., 2015).

The "Hedonic" aspect of ill-being was measured with the negative experience dimension of the Scale of Positive and Negative Experience (SPANE) in which participants were asked to assess their negative emotional experiences (e.g., "Unpleasant") over the previous 4 weeks on a 7-point Likert scale, ranging from 1 ("*Never*") to 7 ("*Always*"). Alfa was estimated at .81 in the original study (Diener et al., 2010) and at .84 for the Portuguese version (Silva & Caetano, 2013).

Creativity was assessed using the four-item production of creative ideas dimension from the instrument developed by Zhou and George (2001). Items (e.g., "I exhibit creativity on my assignments when given the opportunity to") are rated on a 7-point Likert scale, ranging from 1 ("Strongly disagree") to 7 ("Strongly agree"). The coefficient alpha value was .83 (Zhou & George, 2001).

Intention *to leave occupation* was measured with the four-item general effort job search scale (Blau, 1993), in which respondents were asked if they actively engaged in job search activities in the past three months. Items (e.g., "Focused my time and effort on job search activities") are rated on a 7-point Likert scale, ranging from 1 ("Strongly disagree") to 7 ("Strongly agree"). Coefficient alpha values were .76 (Blau, 1993) and .90 (Sousa & Larsson, 2013).

Job satisfaction was assessed with a three-item measure for overall job satisfaction developed by Cammann et al. (1983). Items (e.g., "I feel a sense of pride in doing my job") are rated on a 7-point Likert scale, ranging from 1 ("*Strongly disagree*") to 7 ("*Strongly agree*"). The coefficient

alpha value ranged from .67 to .95 in previous studies (Fields, 2002; Namayandeh et al., 2011; O'Connor & Vaughn, 2018) and .89 (Ferreira et al., 2017) in the Portuguese-speaking population.

Perceived performance was evaluated using a four-item Technical Performance Scale developed by Abramis (1994). Items (e.g., "In the last week, I handled the responsibilities and daily demands of my work") are rated on a 7-point Likert scale, ranging from 1 ("*Strongly disagree*") to 7 ("*Strongly agree*"). Coefficient alpha values were .83 (Abramis, 1994) and .90 (Junça-Silva & Caetano, 2021).

Gig income was assessed by asking the respondents, "*Considering the last 3 months, what was your average monthly income as a gig worker, using as a reference the one where you work the most hours?*" While *Combined income* was evaluated with the following question "*Considering the last 3 months again, but now accounting for all your gig occupations, what was your average monthly income?* For both questions, respondents had six options available that ranged from less than one Brazilian minimum wage to more than 10 Brazilian minimum wages.

Translation procedure

The original self-report job precariousness scale in English was translated into Portuguese by three professional translators. The best translation for each item was then selected based on a consensus among the translators. Following this, an independent translator who had no contact with the original scale proceeded to translate the scale back into English. The accuracy between the items of the original and back-translated scales was checked by all the translators involved in the previous stages (Hambleton, 2001). Finally, the quality and intelligibility of the Brazilian version of the self-report job precariousness scale was tested in a pilot study with a sample of five Brazilian workers of both sexes and distinct levels of education, aged between 18 and 53 years old. All items were considered clear and understandable to all participants.

Statistical analysis

The Statistical Package for the Social Sciences® (SPSS, version 27.0) and Analysis of Moment Structures® (SPSS AMOS, version 28.0) were used to perform the statistical analyses.

Firstly, an exploratory factor analysis (EFA), based on principal components analysis (PCA), was performed to determine the internal structure of scales. Factors were extracted using an oblique rotation (Direct Oblimin) (Bartholomew et al., 2011a; Bartholomew et al., 2011b; Longo et al., 2016).

After EFA, confirmatory factorial analysis (CFA) was performed. In the sample, all univariate skewness and kurtosis values were below 2 and 7. However, Mardia's coefficient for multivariate normality exceeded the value of 5 ($p < .001$), suggesting multivariate non-normality (Kline, 2016). Therefore, CFA was conducted using the maximum likelihood method accompanied by the bootstrapping technique with 5000 iterations. To compare model fit across competing models, several indexes were adopted: $\chi 2/df$, comparative fit index (CFI), standardized root mean square residual (SRMR), root mean square error of approximation (RMSEA), Bayesian information criterion BIC, and Akaike's information criterion (AIC).

General guidelines indicate that the values of $\chi 2$/df ratios on the order of 3/1 or less indicate better-fitting models (Hair et al., 2013). CFI ≥ .95 is considered indicative of a good-fitting model (Bentler, 1990; Brown, 2006; Hu & Bentler, 1999; Kline, 2016). SRMR values of .08 or less are desired (with CFI above .92) (Brown, 2006; Hair et al., 2013; Hu & Bentler, 1999). RMSEA values below .05 indicate a good fit (Browne & Cudeck, 1989). Both BIC and AIC are measures intended to compare models to identify the one with the best predictive power, which is usually the model with the smallest values of AIC or BIC (Hair et al., 2013).

Reliability analysis was performed by estimating Cronbach's alpha and McDonald's omega coefficients, and through bifactor model estimates.

Criterion validity was made through zero-order correlation analysis.

RESULTS

Before the main analyses, the dataset was screened to detect outliers: four univariate (i.e., $Z < 3$) and nine multivariate outliers (i.e., Mahalanobis distance at $p < 0.001$) were identified and removed from the analysis.

Exploratory Factor Analysis (EFA)

EFA was performed to determine the internal structure of the Brazilian version of the job precariousness scale. Data and sample were considered suitable for PCA, as the Kaiser–Meyer–Olkin value is higher than 0.60 (KMO = 0.784), and the Bartlett sphericity test is significant ($p < .001$). The first six eigenvalues (and % of variance accounted for) were 4.18 (34.73%), 1.61 (13.41 %), 1.54 (12.82 %), 1.331 (11.09 %), .69 (5.73 %), and .58 (4.86 %).

Scree plot analysis and the verification of the eigenvalues were conducted, indicating the retention of four factors. Four factors were extracted using an oblique rotation (Direct Oblimin). Table 2 shows that except for one item with a factor loading slightly below 0.70 (0.6888), all other 11 items exhibited factor loadings higher than 0.70.

Table 2. Items and factor loadings for the Brazilian version of the Self-report job precariousness scale.

	Structure coefficients				Pattern coefficients			
	JF	JR	JS	JC	JF	JR	JS	JC
1. Você consegue tirar férias ou interromper o trabalho sem preocupar-se em ser penalizado? (R) *Are you able to take time off for a holiday or break from work without worrying about losing your job or being penalized? (R)*	.829				.807			

continue

Table 2 Items and factor loadings for the Brazilian version of the Self-report job precariousness scale

	Structure coefficients				Pattern coefficients			
	JF	JR	JS	JC	JF	JR	JS	JC
2. Você pode tirar uma folga se não estiver sentindo-se bem sem preocupar-se em ser penalizado? (R) *Are you able to take time off if you are unwell without worrying about losing your job or being penalized (e.g., hours cut)? (R)*	.930				.927			
3. Você pode tirar uma folga por motivos pessoais sem preocupar-se em ser penalizado? (R) *Are you able to take time off for personal reasons without worrying about losing your job or being penalized? (R)*	.933				.943			
4. Você pode opinar sobre quantas horas você trabalha por semana? (R) Do you have a say in how many hours you work each week? (R)				-.886				-.895
5. Você consegue negociar seu horário de trabalho (por exemplo, os dias e horários em que trabalha)? (R) *Are you able to negotiate your work schedule (e.g., the days and times you work)? (R)*				-.860				-.846
6. Como trabalhador independente, você consegue negociar as condições de trabalho que mais lhe convêm? (R) Are you able to negotiate working conditions that better suit you? (R)				-.829				-.822
7. Seu pagamento atende despesas inesperadas? (R) Does *your* pay meet unexpected expenses? (R)		-.844				-.804		

continue

Table 2. Items and factor loadings for the Brazilian version of the Self-report job precariousness scale

	Structure coefficients				Pattern coefficients			
	JF	JR	JS	JC	JF	JR	JS	JC
8. Seu pagamento permite gastos opcionais (por exemplo, férias, restaurantes, hobbies)? (R) Does your pay enable discretionary spending (e.g., holidays, eating out, hobbies)? (R)		-.835				-.787		
9. Seu pagamento cobre suas necessidades básicas (por exemplo, comida, aluguel/renda, empréstimos, contas)? (R) Does the pay from your job/s cover your basic needs (e.g., food, rent/loans, bills)? (R)		-.784				-.830		
10. Você está preocupado em perder sua ocupação atual em um futuro próximo? Are you concerned about losing your current job in the near future?			.843				.825	
11. As pessoas no seu contexto de trabalho estão preocupadas com a possibilidade de perderem a ocupação em um futuro próximo? Are colleagues at your workplace concerned that they will lose their job in the near future?			.823				.846	
12. A sua ocupação atual é insegura (por exemplo, ela pode ser facilmente rescindida pelo seu empregador/cliente)? Is your current job insecure (e.g., your job could easily be terminated by your employer)?			.700				.688	

Notes: R = reversed items.

concludes

Confirmatory Factor Analysis (CFA)

Table 3 displays the overall fit indexes obtained in the four competing models as a result of CFA. Considering all indexes, and especially BIC and AIC, Model 4 presented the best-fit model. Bi-factor model was chosen for the remaining analyses.

Table 3. Goodness-of-fit measures for the competing models – Brazilian version of the Self-report job precariousness scale.

Model	x^2	$x^{2/df}$	df	cfi	rmsea (90% ci)	BIC	AIC
Model 1	1143.053	21.168	54	.552	.202 (.192 - .212)	1292.011	1191.053
Model 2	89.324	1.861	48	.983	.042 (.028 - .055)	275.521	149.324
Model 3	94.032	1.881	50	.982	.042 (.029 - .055)	267.816	150.032
Model 4	65.612	1.458	45	.992	.030 (.011 - .046)	270.429	131.612

The values for standardized regression weights for each one of the four specific dimensions and the general job precariousness are displayed in Table 4. All factor loadings were significant at $p < .05$.

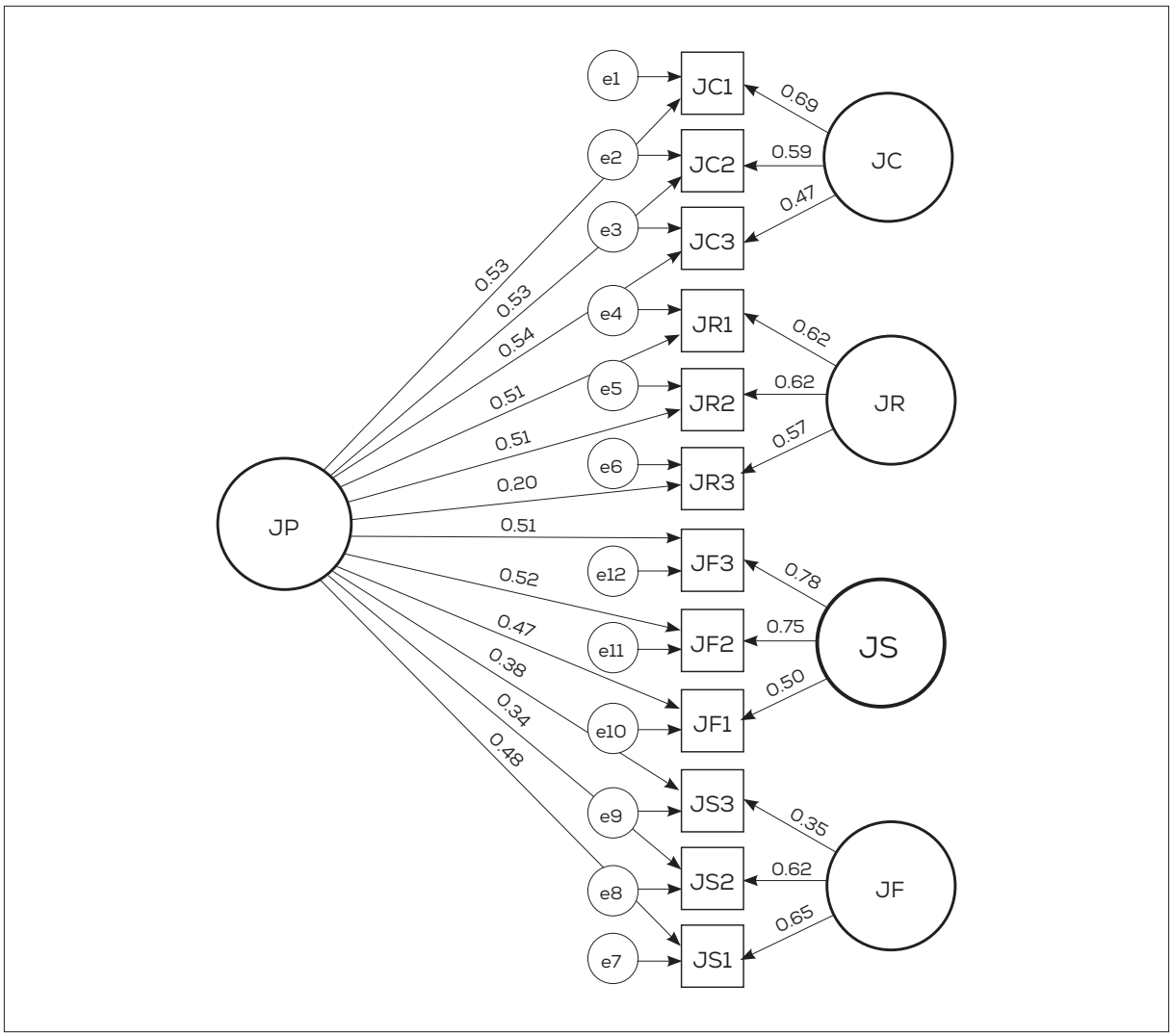
Table 4. Standardized factor loadings of the bifactor model for Brazilian version of the Self-report job precariousness scale.

	General dimension Job Precariousness	Specific dimensions
Job conditions		
Item 1	.527	.689
Item 2	.531	.588
Item 3	.536	.467
Job remuneration		
Item 1	.511	.623
Item 2	.511	.616
Item 3	.200	.572
Job flexibility		
Item 1	.469	.498
Item 2	.522	.750
Item 3	.511	.777
Job security		
Item 1	.480	.651
Item 2	.340	.621
Item 3	.385	.350

Note. All factor loadings were significant at p < .05.

Figure 2 illustrates the bi-factor model.

Figure 2. Confirmatory factor analysis of the Brazilian version of the Self-report job precariousness scale.



Note: JP = job precariousness; JC = job conditions; JR = job remuneration; JS = job insecurity; JF = job flexibility.

Reliability

Cronbach's alpha coefficient reports the degree to which responses are consistent across the items of a measure, with desired values above .70 (Hair et al., 2013; Kline, 2016). Cronbach's alpha coefficients (Table 5) for all dimensions were above the acceptability limit, including the full scale. The dimension with the best internal consistency is job flexibility (.88), while job security has the lowest (.70).

Table 5. Reliability alpha estimates for dimensions of Brazilian version of the Self-report job precariousness scale.

Dimension	Cronbach's alpha coefficients	
	Brazilian version	Original version
Full scale	.82	.83
Job conditions	.82	.82
Job remuneration	.76	.87
Job security	.70	.79
Job flexibility	.88	.86

To further explore the bifactor model properties, the following indices were calculated: explained common variance (i.e., the proportion of common variance explained by the general factor compared to the specific factors), Omega (i.e., the proportion of variance explained when considering all items in a factor), Omega H (i.e., the proportion of unique variance explained by a factor), and Relative Omega (i.e., the percentage of reliable variance attributed to a factor) (Reise et al., 2013). The estimates were obtained using a bifactor indices calculator (Dueber, 2017) and are displayed in Table 6.

Table VI. Bifactor estimates – Self-report job Precariousness scale.

Dimension	ECV	Omega/ OmegaS	OmegaH/ OmegaHS	Relative Omega
General factor	0,37	0,90	0,63	0,70
Job security	0,55	0,83	0,45	0,55
Job flexibility	0,66	0,78	0,54	0,69
Job remuneration	0,65	0,88	0,57	0,65
Job conditions	0,65	0,72	0,46	0,64

Notes. ECV = Explained common variance.

Regarding explained common variance, desired values should exceed .60, which is the case for the dimensions of job flexibility, job remuneration, and job conditions, while the value of job security was slightly under the threshold (.55). The general factor presented an even lower value (.37). Omega values remained above .70, indicating acceptable reliability, with the highest value obtained for the general factor (.90), indicating that both the general factor and subscales had high reliability. Concerning Omega H, general factor, job flexibility, and job remuneration scores are above the desired value of .50. However, values for job security (.45)

and job conditions (.46) were just slightly under the threshold, indicating that both the general and subscale factors generate meaningful measures of job precariousness. Finally, concerning Relative Omega, all values are above .55, and the highest value is attributed to the general factor that explains 70% of reliable variance in the multidimensional composite due to the respective factor; therefore, both the general and subscales accounted for meaningful variance in the model.

Criterion validity

To assess the criterion validity, the relationship between precariousness and variables of work outcomes and well-being/ill-being were tested. Considering that empirical research has extensively associated job precariousness with negative consequences for workers, such as ill-being (Llosa-Fernández et al., 2018) and turnover intentions (Allan et al., 2017; Sverke et al., 2002), while it is negatively associated with well-being (Gildner et al., 2019; Llosa-Fernández et al., 2018; Sverke et al., 2002) and positive work outcomes (Allan et al., 2017; Creed et al., 2020; Cuyper et al., 2009; Feather & Rauter, 2004; Sverke et al., 2002), it is expected that job precariousness has a positive relationship with ill-being and intention to leave occupation, and a negative relationship with well-being and positive gig work outcomes (e.g., creativity, job satisfaction, perceived performance and gig income).

The correlation matrix (Table 7) demonstrates that job precariousness and its four dimensions do not present significant associations with sociodemographic variables. The only exception is the negative association between job remuneration and weekly dedication to gig work.

Table 7. Bivariate correlations among variables included in the study – Self-report job Precariousness scale.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1.AGE	--															
2.EDU	.51**	--														
3.TENU	.43**	.20**	--													
4.WEHO	.07	.08	.07	--												
5. JP	.09	.03	.02	-.04	--											
6. JC	.08	.01	-.05	.11	.65**	--										
7. JR	.04	-.03	-.03	-.28**	.64**	.25**	--									
8. JS	-.00	.05	-.05	.07	.65**	.23**	.25**	--								
9. JF	.10	.04	.10	-.00	.75**	.35**	.28**	.35**	--							
10. WELL	.16**	.05	.12*	.09	-.43**	-.36**	-.30**	-.34**	-.24**	--						
11. ILL	-.20**	.02	-.02	.14*	.34**	.27**	.17**	.26**	.27**	-.56**	--					

continue

Table 7. Bivariate correlations among variables included in the study – Self-report job Precariousness scale. concludes

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
12. CREA	.03	.08	.01	.12*	-.47**	-.30**	-.48**	-.29**	-.25**	.40**	-.21**	--				
13. INTE	-.16**	-.08	-.08	-.01	.40**	.19**	.31**	.30**	.27**	-.35**	.33**	-.39**	--			
14.JOBS	.09	.05	.01	.04	-.47**	-.35**	-.29**	-.34**	-.31**	.66**	-.45**	.47**	-.47**	--		
15.PERF	.02	-.09	.01	.11	-.23**	-.10	-.22**	-.21**	-.12*	.32**	-.27**	.28**	-.18**	.40**	--	
16.GINC	.30**	.35**	.24**	.35**	-.26**	-.04	-.44**	-.10	-.11	.18**	-.05	.35**	-.33**	.20**	.09	--

Note: EDU = educational level; TENU = tenure in gig work; WEHO = weekly dedication to gig work; JP = job precariousness; JC = job conditions; JR = job remuneration; JS = job insecurity; JF = job flexibility; WELL = well-being; ILL = ill-being; CREA = creativity; INTE = intention to leave occupation; JOBS = job satisfaction; PERF = perceived performance; GINC = gig income.

** p <.01; * p <.05

Conversely, results indicate that both well-being and ill-being present significant correlations with job precariousness and the four dimensions. However, while the associations with well-being are negative and moderate, ill-being associations range from weak to moderate and positive.

Finally, when considering work outcomes, job precariousness and job remuneration have significant associations with all variables investigated. On the other hand, the dimension of job conditions does not correlate significantly with perceived performance and gig income, and job security and job flexibility do not have a significant relationship with gig income. In addition, job precariousness and its dimensions correlate negatively with positive work outcomes, and negatively with intention to leave occupation.

DISCUSSION

This study aimed to adapt and validate the self-report job precariousness scale for the Brazilian working population. This scale was originally developed to evaluate precarious working conditions among young adults who study and work (Creed et al., 2020), presenting acceptable behavior. Overall, the results obtained in this study provide valid and reliable evidence that the self-report job precariousness scale is an instrument that has robust psychometric qualities to assess Brazilian gig workers' perception of precarious working conditions.

Consistent with previous studies (Creed et al., 2020), EFA performed on the 12 items included in the self-report job precariousness scale extracted four adequately individualized factors, distinguishing the dimensions assessing job conditions, job flexibility, job remuneration, and job security.

Subsequently, CFA results indicated that Model 4 presented the most adequate fit indexes in relation to the other models considered in this study, including the lowest score for AIC and BIC indices, where lower values indicate better model fit (Hair et al., 2013). Therefore, the best structural organization of the self-report job precariousness scale is the bi-factor model solution in

which all 12 items load both on one of the four factors and the general job precariousness factor. In the original study, the four-factor model presented the lowest AIC. However, improvements in relation to the bi-factor model were marginal (Creed et al., 2020), reinforcing the assumption that the job precarious scale is a multidimensional measure with a hierarchical structure, allowing the evaluation of a single measure of job precariousness (i.e., full-scale) or each one of the four constructs separately in order to address different aspects of precarious work arrangements.

Cronbach's alpha coefficients and bifactor indices were calculated to test the reliability of the Brazilian version of the self-report job precariousness scale. Results indicate that the self-report job precariousness scale presents adequate internal consistency both for all four dimensions and for the full scale since all estimates obtained are above .70. Both in the original scale and in the Brazilian version, job security is the dimension with the lowest alpha, and while in Brazilian version job flexibility presented the highest internal reliability, job remuneration had the greatest alpha in the original version (Creed et al., 2020). In addition, bifactor indices indicate high reliability for the general factor and subscales (although several scores for explained common variance and for Omega H were slightly below the desired threshold), suggesting that both the general factor and four dimensions provide meaningful evaluations of job precariousness in Brazilian gig workers.

It is noteworthy that scale dimensions are denominated after the original version (Creed et al., 2020). However, the items that constitute the scales for job conditions, job remuneration, and job flexibility are reversed scored. In this sense, the job conditions dimension refers to the perception of disempowerment and vulnerability in settling or advocating for adequate work conditions (Vives et al., 2010); the job remuneration dimension aims to address income inadequacy and low wages extensively associated with precarious forms of employment (Benach et al., 2014; Creed et al., 2020; Mullany et al., 2021; Vives et al., 2010); and job flexibility covers aspects concerning gig workers' limited capacity to exercise rights such as sick leave (Vives et al., 2010; Vives et al., 2015). Finally, despite being denominated job security, the items that constitute this dimension assess workers' perceived insecurity in relation to the future continuance of their work, which constitutes a key component in precarious work (Allan et al., 2021; Bosmans et al., 2016; Hellgren et al., 1999).

Finally, regarding criterion validity analysis, results are consistent with empirical findings that demonstrate that job precariousness is associated both with negative subjective experiences and negative work outcomes.

Results indicate that both well-being and ill-being present significative correlations between job precariousness and its four dimensions. The association between precarious work and increased levels of ill-being has been supported by theoretical (Benach et al., 2014; Benach et al., 2016), meta-analytical (Llosa-Fernández et al., 2018), and empirical research conducted with the European (Mai et al., 2019) and African samples (Mullany et al., 2021). Similarly, the link between job precariousness and decreased levels of well-being has been extensively suggested by meta-analytical evidence (Cheng & Chan, 2008; Llosa-Fernández et al., 2018; Sverke et al., 2002) and empirical research conducted with Australian working

students (Creed et al., 2020), older adults from China, Ghana, India, Mexico, Russia, and South Africa (Gildner et al., 2019), and temporary and permanent Spanish workers (Vives et al., 2010). Results obtained in this study support Ronnblad et al. (2019) conceptualization of job precariousness as a job-related stressor, considering its harmful effects on workers' psychological health and well-being.

Moreover, in this study, job precariousness and its four dimensions have also been statistically associated with adverse work outcomes. This result also supports previous research on the topic (Allan et al., 2021). Specifically, income inadequacy has been linked to decreased performance (Allan et al., 2017), while turnover intentions have been associated with job insecurity (Sverke et al., 2002) and inadequate job remuneration (Sverke et al., 2002). However, it is noteworthy that, in this study, job conditions did not correlate with perceived performance and gig income, suggesting that gig workers' performance is not affected by the workers' capacity to settle conditions. This fact may be because gig workers usually have a high level of flexibility and autonomy in defining work schedules and methods; in fact, in this study, while respondents scored very low on job conditions (M = 2,91), the mean scores for autonomy of schedule and method exceeded 5, this situation may have affected the associations between the variables.

Moreover, gig income does not seem to be associated with the dimensions of job conditions, job flexibility, and job security, possibly due to the fact that, in many platforms, both job remuneration and jobs (gig) availability are defined by criteria established by algorithms and/or clients. Therefore, workers can only exercise their autonomy to accept/decline the offers to generate their income. Job remuneration and gig income are both statistically associated with weekly dedication to gig work, suggesting that, to compensate for the low wages (i.e., job remuneration), gig workers engage in long working hours to generate an adequate income. Similarly, empirical research has already identified that gig workers are more susceptible to precarious work conditions such as low pay, social isolation, overwork, sleep deprivation, and exhaustion (Wood et al., 2019). Therefore, due to the scarcity of empirical research on the subject, the results obtained in this study align with theoretical assumptions regarding the detrimental effects of precarious conditions on health and well-being to which most gig workers are subjected.

Finally, this research provides valuable theoretical contributions. Despite the relevance of job precariousness for management studies, there is a scarcity of valid and reliable measures in scientific literature to assess precarious work (Creed et al., 2020; Ervasti & Virtanen, 2019; Vives et al., 2010). Studies have mostly relied on binary data (Creed et al., 2020) and a previously published measure of precarious employment – the Employment Precariousness Scale (EPRES) (Vives et al., 2010; Vives et al., 2015) – presents several psychometrical deficiencies (Creed et al., 2020). In this regard, the introduction of the Brazilian version of the self-report job precariousness scale provides several contributions and implications for practice and research. It introduces a reliable and valid measure to adequately investigate the precarious conditions to which gig workers are subjected. In the face of the growing body of empirical research investigating the effect of job precariousness on ill-being, well-being, and work outcomes

(Allan et al., 2017; Allan et al., 2021; Benach et al., 2014; Benach et al., 2016; Bosmans et al., 2016; Cheng & Chan, 2008; Creed et al., 2020; Cuyper et al., 2009; Feather & Rauter, 2004; Gildner et al., 2019; Hellgren et al., 1999; Jiang & Probst, 2013; Llosa-Fernández et al., 2018; Mai et al., 2019; Mullany et al., 2021; Ronnblad et al., 2019; Sverke et al., 2002), the gig work population had been neglected so far. Therefore, this study provides evidence indicating that, among gig workers, the association between job precariousness with well-being, ill-being, and gig work outcomes is in line with previous empirical studies conducted with samples from other work contexts and cultures.

Recommendations for practice

Non-standard forms of work arrangements such as freelance and gig work have received little attention from industrial and organizational psychology literature (Bergman & Jean, 2016; Keith et al., 2020; Watson et al., 2021), imposing new implications and challenges to HRM practitioners (Kelliher & Anderson, 2009; Kowalski & Loretto, 2017; McDonnell et al., 2021), especially because an increasing number of corporations have relied on gig workforce mainly to improve productivity and to lower costs (Intuit, 2010; Yildirmaz et al., 2020). In this regard, considering the profound and ongoing changes affecting work relations and conditions in the past decades, investigations regarding the influence of work conditions on both well-being and ill-being (Keith et al., 2020; Kowalski & Loretto, 2017; Watson et al., 2021), and consequently work outcomes can provide managerial practical contributions for the development of interventions in order to enhance workers' well-being and minimize ill-being. Additionally, understanding the antecedents and consequences of workers' positive and negative subjective experiences can provide HRM practitioners, organizations, and policymakers with consistent information to provide workers with fair and decent working conditions, promoting a healthy work environment (Kowalski & Loretto, 2017; Marmot, 2010).

This study found that job precariousness affects both ill-being (increasing) and well-being (decreasing), which will subsequently affect work outcomes. In this sense, although the essence of gig work goes in line with the conceptualization of precarity, actions such as the establishment of a minimum wage, health protection, and holiday pay, already insured by law in places like the United Kingdom and California (Marshall, 2019; McCulloch, 2021; Siddiqui, 2020), can be adopted by digital platforms with the aim not only of promoting the mental health of gig workers but also to improve the services they provide to their customers.

Evidence also indicates that the perception of autonomy tends to promote positive experiences among workers, resulting in desirable work outcomes. In this sense, autonomy refers to the amount of freedom provided to workers for defining their working schedule, making decisions, and determining the procedures and methods necessary to perform tasks associated with one's job (Hackman & Oldham, 1975; Morgeson & Humphrey, 2006). Although gig work is usually praised for providing high levels of autonomy to workers (Bajwa et al., 2018; Donovan et al., 2016), gig workers subjected to algorithmic management often have little autonomy to

select the most attractive or appropriate job opportunity, set prices and negotiate job terms and conditions, or determine the pace of their work (Jabagi et al., 2019; Kuhn, 2016; Wood et al., 2019). Thus, as suggested by Jabagi et al. (2019), implementing "autonomy supportive" gig work contexts should guarantee the beneficial effects of autonomy to gig workers and gig work outcomes. Therefore, "autonomy supportive" environments require the presence of facilitating factors such as decision-making autonomy (e.g., work assignment, price negotiation, and cancellation penalties), work-methods autonomy (e.g., task standardization and surveillance), and feedback and acknowledging perspectives (e.g., positive feedback, constructive feedbacks, rate penalties, and recourse for unfair ratings).

Furthermore, creating online forums and chats that promote information and support exchange between gig workers, even if geographically distant, can be an important tool to satisfy workers' needs regarding social support and reduce the harmful effects associated with job precariousness. A study conducted with 10.000 crowd workers identified that a communication network was used mainly to support each other and share information (Yin et al., 2016).

In short, research findings suggest several courses of action for policymakers, digital platforms, HRM practitioners, and organizations that rely on the gig workforce to reduce negative subjective experiences and the undesirable work outcomes associated with such a phenomenon. Overall, it is suggested that reducing the precarious conditions associated with gig work not only reduces ill-being, but also increases well-being among gig workers.

CONCLUSIONS

By introducing the Brazilian version of the self-report job precariousness scale, this study provides several contributions and implications for practice and research. First, it introduces a reliable and valid measure to adequately investigate both the precarious conditions to which gig workers are subjected. Despite the growing body of empirical research investigating the effect of job precariousness on ill-being, well-being, and work outcomes (Allan et al., 2017; Allan et al., 2021; Benach et al., 2014; Benach et al., 2016; Bosmans et al., 2016; Cheng & Chan, 2008; Creed et al., 2020; Cuyper et al., 2009; Feather & Rauter, 2004; Gildner et al., 2019; Hellgren et al., 1999; Jiang & Probst, 2013; Llosa-Fernández et al., 2018; Mai et al., 2019; Mullany et al., 2021; Ronnblad et al., 2019; Sverke et al., 2002), this study provides empirical evidence indicating that, among gig workers, the association between job precariousness with well-being, ill-being, and gig work outcomes are in line with previous theoretical and empirical studies conducted with samples from other work contexts and cultures.

Second, this study was conducted with a Brazilian sample and introduces an instrument in Portuguese, contributing to the diversification and generalization of studies conducted to investigate subjective and objective consequences of poor working conditions associated with this new form of work arrangement. Therefore, due to the high proportion of self-employed

professionals and the increasing number of Brazilian workers resorting to gig work to generate income in times of economic crises and high unemployment rates (Barros, 2021; Góes et al., 2022; Mastercard & Associates, 2019), it is recommendable and plausible that an empirical research conducted with Brazilian gig work population provides relevant insights on the dynamics of this new form of work arrangement, thus satisfying the need for empirical research on well-being in the workplace conducted in developing or lower-income countries, indicated by Kowalski and Loretto (2017). However, it is important that this study is replicated with samples made up of workers from other segments of the economy and from other countries to verify whether the relationships found in this study are also observed in other populations.

This study also presents several limitations. First, the study relied on a self-selection sampling technique, meaning that gig workers decided to participate in the survey (Saunders et al., 2009). Although this non-probability sampling technique is cost and time-saving, it can potentially lead to self-selection bias in which the gig workers that chose to participate in the study are not equivalent, in terms of the investigated variables, to the group of gig workers that opted for not participating, which requires caution in generalizing the results to the whole working population. Furthermore, since the survey was propagated online, gig workers without internet access are under-represented in the sample. Therefore, future studies can benefit from replicating this research in more representative samples of different gig work profiles. Second, the criterion validity results regarding the relationships between job precariousness and psychological and work outcomes are cross-sectional. Therefore, longitudinal studies are necessary to explore the causal influences between the variables.

Finally, this study sample was mostly comprised of traditional Brazilian gig workers (i.e., independent workers who do not rely on technologically enabled networks or agencies to find jobs) (Watson et al., 2021). While some characteristics associated with gig work are experienced by gig workers in general, other profiles of gig workers (e.g., gig service providers, gig goods providers, gig data providers, and agency gig workers) may be more susceptible to certain demands and resources due to the nature of their specific type of gig work performed (Keith et al., 2020; Watson et al., 2021), which requires caution in generalizing the results to the whole gig work population. Likewise, when interpreting the results of this study, it is important to consider that, due to its continental dimension, Brazil presents regional particularities with regard to economic and cultural activity, considering gig work (as presented in the study of Góes et al. [2022] on the distribution of gig workers) or regarding other occupations subject to precarious working conditions.

In sum, this study contributes to the current literature by introducing the Brazilian version of the self-report job precariousness scale, which is considered equivalent to the existing version in English with robust psychometric qualities to assess gig workers' perception of job precariousness in the Brazilian context.

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CONFLICTS OF INTEREST

The authors have no conflicts of interest to declare.

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Paula Martins Nunes: Conceptualization, data curation, formal analysis, Research; Methodology; Validation; Writing – original draft.
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