

Stress and the gig economy: it's not all shifts and giggles

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Abstract: Gig work is a type of contingent work which has increased markedly in recent times, and is characterised by uncertainty, unpredictability, and instability of both schedules and income earned. Gig workers are also likely to work for multiple platforms and/or employers. These work characteristics mean that performing gig work is associated with higher rates of stress than the general population (Madden *et al.* Pers Rev 2017). However, it is not currently known which strategies gig workers use to cope with this stress – including which strategies are likely to be effective. The aim of this study was to understand the relationship between coping strategies, number of employers and stress in gig workers. An online survey was completed by 49 gig workers. Validated questionnaires were administered to measure coping strategies (Brief COPE) and stress (Perceived Stress Scale-14). Approach coping strategies (active, planning, and social support) were associated with reduced stress ($p < 0.05$), whereas the avoidant coping strategy of self-blame was associated with increased stress ($p < 0.05$). No differences in stress were seen between gig workers with one employer and those with multiple employers. Findings suggest that some coping strategies may lower stress in gig workers, though long-term outcomes should be considered in future research.

Key words: Gig workers, Coping strategies, Stress, Multiple employers

Introduction

The gig economy is on the rise and includes various forms of contingent work arrangements, such as freelance and short-term work². The business models used in the gig economy aim to reduce labour costs such as insurance and paid leave, and generally consider workers to be independent contractors³. This provides a high level of flexibility for the employer and the workers; however, it shifts different costs related to training, paid leave, and insurance to the workers⁴, and results in a precarious working arrangement for many individuals⁵. Some of the characteristics of this

kind of work include having multiple employers, working on a temporary basis, working on-call, having few work hours or tasks, or sometimes having no work at all⁶. Estimating the number of people employed by the gig economy is difficult as a result of the opportunity (and often financial necessity) to work for more than one platform (e.g., Uber, Menulog, DiDi) simultaneously.

In addition to the precarious nature of gig work (i.e., whether 'gigs' will be available), this population of workers generally do not have a steady work schedule and may work different times of the day or night throughout the week. Moreover, many jurisdictions have limited regulatory practices in place for gig workers (e.g., work hour limitations, fatigue management) – which can lead to further instability. Unpredictability and instability in both work schedules and income earned are associated with high lev-

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els of stress^{7, 8}). Prolonged stress can lead to poor physical health, as well as mental health problems such as depression and anxiety, in addition to substance abuse, low job satisfaction, fatigue, and sleep-related issues⁹. The relationship between routine certainty and health has also been explored in workers doing precarious work⁷, such as gig work. While there is limited research in the area, evidence suggests that gig work is associated with poor mental health (including stress), potentially as a result of poor job stability, low wages¹⁰, and worker surveillance and evaluation (e.g., consumer rating systems)¹¹.

While not researched in gig worker populations, evidence suggests that certain work characteristics are likely to result in psychological stress. For example, nonstandard working hours are associated with increased stress because of constant changes in sleep patterns and having to accommodate domestic roles⁸. It has also been suggested that unpredictability and uncertainty of work affect health and well-being of workers as a result of the difficulty in balancing work and personal lives⁷. Given the unpredictability of gig work, in combination with non-standard work hours, it appears gig workers may be at particular risk of experiencing high levels of psychological stress. Not only this, but there have been recent calls for research addressing the physical and mental health of gig workers¹².

Another aspect of gig work that may increase stress is that, due to the unpredictable and uncertain nature of gig work, an increasing number of people work more across more than one platform/employer to earn sufficient income. While some gig work platforms consider gig workers to be independent contractors – for the purposes of this paper we will describe each platform as a ‘job’ (though this may not be technically correct depending on the jurisdiction and contracts held). While little evidence is available on the impact of working across multiple platforms for gig workers, some research suggests that individuals working with multiple jobs experience increased stress levels as compared to single job holders¹³. Having multiple jobs may result in increased stress due to factors such as scheduling difficulties, being unable to spend time on self-care activities, and managing work-life balance^{14–16}. Evidence from a health-care sample suggests that holding multiple jobs is associated with higher dissatisfaction with their work, in addition to greater intentions to leave the field in the next 1–5 years¹⁷. Furthermore, one study examined stress in 83 full-time workers and found holders of multiple jobs had high self-reported stress levels, particularly in relation to their primary job¹⁸. Conversely, another study conducted by Bouwhuis *et al.* showed no difference in stress levels be-

tween single and multiple jobholders, though this research was not performed in gig workers specifically¹⁹. Additionally, other evidence suggests that there may be specific groups of workers who are particularly vulnerable to stress resulting from holding multiple jobs¹⁹. These vulnerable groups tended to include women, individuals with lower education levels, and individuals whose jobs afforded lower levels of consistency and security – which may also align with individuals performing gig work.

To manage stress, gig workers may adopt different kinds of coping strategies. However, to date, no research has been performed on specific coping strategies in this population. Coping is a process whereby individuals aim to reduce negative feelings caused by an undesirable event²⁰. Some coping strategies include seeking social support, avoidance, and religious coping²¹. Coping strategies can be divided into two main categories: approach coping strategies (where the individual aims to deal directly with the stressor) and avoidant coping strategies²². Approach coping strategies are problem focused and use cognitive and behavioural efforts to deal with stress^{23, 24}. Conversely, the aim of using avoidant coping strategies is to avoid dealing with stress and reducing any potential threats²⁵. While there are some inconsistencies, previous research generally indicates that approach coping strategies are likely to be the most effective for managing stress^{26, 27}. On the contrary, the use of avoidant coping strategies has been related to poor wellbeing and increased occupational stress^{28, 29}. While the relationship between these two main categories of coping strategies and stress has been explored in literature in general, it needs to be studied in gig workers given the aspects of gig work that cause stress.

Given the novelty of this population, pilot investigation is necessary to understand the capacity for research to be undertaken in gig workers. The present study aimed to identify the types of coping strategies undertaken by gig workers, in addition to gaining an understand the relationship between approach and avoidant coping strategies and stress in this population. We also aimed to investigate the relationship between stress in gig workers who have one employer compared with multiple employers.

Subjects and Methods

Design

This study used a cross-sectional quantitative design. Data were collected through an anonymous survey created using Qualtrics (Provo, UT). Participants self-identified as doing gig work in Australia and were excluded if they were

under 18 years of age. Ethical approval was granted by the Central Queensland University Human Research Ethics Committee (2020-105).

Procedure

Participants were recruited using social media (Twitter and Facebook). The primary method of recruitment was via Facebook groups aimed at gig workers, as no standard companies could be contacted to aid with recruitment (as may be possible with a ‘standard’ workforce). The potential pool of respondents from relevant Facebook groups ranged from ~500–7,000 per group (approximately 10 groups were identified for contact). Furthermore, relevant hashtags were used within Twitter posts to reach Australian gig workers. The survey link was accompanied by an information sheet which gave a brief description of the study. Participants were informed that their participation was anonymous and voluntary, and they could withdraw anytime. Participants were informed that it would take 10–15 minutes to complete the survey. At the end of the information sheet, participants provided their informed consent, including that they were above eighteen years of age, residents of Australia, and had understood the information provided to them. Finally, the participants were provided with the contact details of a helpline (Lifeline Australia) in case they needed support due to any distress caused by taking the survey. If participants wanted to be sent a plain English version of the summary of the study results, they could provide their e-mail address. They were assured that their confidentiality would be maintained if they provided their e-mail address.

Measures

Demographics and Job Characteristics

Participants were asked to confirm that they currently perform gig work. Of note, there are limited consistent definitions of gig work available in the literature. However, critically, all available definitions reflect inherent work instability and the performance of work on an as-needed, and per-task basis. For many individuals, gig work reflects not only app-based work allocation, but a range of arrangements where work tasks are allocated to individuals based on availability. Given the difficulty in defining what constitutes gig work, the following was asked of participants:

In this survey we are interested in finding out information from “Gig Workers”. “Gig” work is a type of contingent work where the workers have one or more of the following work arrangements:

(1) do not have a long-term contract with the employer(s), (2) are working on a temporary basis, (3) work on-call, (4) work variable number of hours/tasks every week (5) work for more than one employer

These workers generally get work through online digital platforms or smartphone application-based connection where employees get connected with the employers (clients or users). However, they may be assigned tasks by the employer through text, email, or phone call. Some examples of this type of work include ride sharing (e.g., Uber), food delivery (e.g., Uber Eats, Menulog), freelancing (Freelancer, Amazon, E-bay), handyman, cleaning services, and retail.

Do you do have any of the above-mentioned type of work arrangements in your life?

Participants were also asked what kind of work they currently engage in that aligns with the term ‘gig work’. Demographic questions included age, gender, the area they live in (e.g., major city, inner regional, outer regional, remote, or very remote), education, and annual income. Participants were asked to select which of the following described their work: application or digital platform based, independent contractor/freelancer, temporary/short term, on-call, have a regular job and supplement with gig work, can get work over text or phone call, and other. Questions also addressed the number of hours worked per week on average, the number of days worked per week on average, and the number of employers they work for. Given the complex terminology around employers, contractors, and subcontractors, we clarified that for the purpose of the survey “if you work under your own ABN and have more than one source of work then you have multiple employers/clients. If your work is application-based, then each application will be considered as one employer”.

Coping Strategies

The second section of the survey included questions related to various coping strategies used by the participants. This section used the Brief Coping Orientation to Problems Experienced (Brief-COPE) Inventory²¹⁾. The Brief-COPE has 14 subscales (each subscale has two items) for the different coping strategies, with each subscale comprising of two items per scale and corresponds to a Likert scale ranging from 1 = “I have not been doing this at all” to 4 = “I have been doing this a lot”. Out of 14 subscales (2 items each), 6 subscales (acceptance, active, planning, emotional support, information support, positive reframing) are categorised as approach coping strategies whereas another 6 subscales (venting, behavioural disengagement, substance

use, self-blaming, denial, self-distraction) are categorised as avoidant coping strategies. The remaining 2 subscales (humour, religion) do not belong to any category. This questionnaire assesses the frequency with which a person chooses particular coping strategies in stressful situations. The Brief-COPE was first validated on a sample of 168 participants and showed adequate factor structure²¹. The reliability of the 14 sub-scales used have shown to be above average and range from $\alpha=0.50$ to 0.90. The approach coping category comprises of six subscales which are: active coping, use of informational support, positive reframing, use of emotional support, planning, and acceptance. The avoidant coping category also comprises of six subscales which are: self-distraction, behavioural disengagement, denial, venting, substance abuse, and self-blame. Humour and religion are neither approach nor avoidance coping strategies. However, they have been included in the analysis as they are part of Brief-COPE scale. There is a total score for each of the 14 subscales of the Brief-COPE inventory, where a higher score means that the participant uses that coping strategy. No items are reverse scored. The total score for each subscale ranges from 2 to 8. Coping strategies can be considered to be both trait or state (i.e., in the moment) characteristics. The Brief-COPE scale can be used to measure both types of coping based on the way questions are asked. Within the present study the present perfect tense was used (i.e., “I have been...”), reflecting situational (state) coping³⁰.

Stress

The third section of the survey gathered information about perceived stress experienced by participants over the past month. For this section, the Perceived Stress Scale 14 (PSS-14) was used³¹. The PSS-14 has a reliability coefficient value of 0.77. This scale was chosen as it is a widely used measure of psychological stress, which is likely experienced by gig workers, due to the precarious nature of their work. The PSS-14 comprises of 14 items with a Likert scale ranging from 0 (never) to 4 (very often), such as, “In the last month, how often have you felt that you were unable to control important things in your life?”. Positively worded items, such as, “In the last month, how often have you dealt successfully with irritating life hassles?” were reverse scored. There is a total score for PSS-14 and ranges from 0 to 56 where higher scores represent higher perceived stress. Low stress scores range from 0–18, moderate stress scores from 19–37 and high stress scores from 38–56³².

Data Analysis

Microsoft Excel was initially used to clean the raw data (Version 16.44; Microsoft Corp, 2018). Statistical Package for the Social Sciences (SPSS Version 27.0; IBM Corp, 2020) was then used to perform statistical analyses. Standard assumption testing was carried out prior to analyses. One-way ANOVAs were performed to compare stress outcomes based on demographic factors (e.g., number of hours and days worked per week). To examine the relationship between the coping strategies (approach and avoidant coping strategies) used and perceived stress, one-tailed bivariate Pearson’s correlations coefficient (r) was calculated. Each of the 14 coping subscales was compared to perceived stress. To examine the relationship between the number of employers and perceived stress an independent samples t-test was conducted. The number of employers had two categories; gig workers having one employer and those having more than one employer. Reported p -values were one-tailed, p -value under 0.05 was considered statistically significant. All data presented as mean \pm standard deviation ($M \pm SD$).

Results

Demographics

Sixty-eight participants commenced the survey; however, 9 people did not do gig work; 1 was under the age of 18; 2 were gig workers but lived overseas; 7 people commenced but did not complete the survey; therefore, all of these individuals were excluded. As a result, the final sample size was 49 participants, with 31 males (63%) and 18 females (37%). Recruitment ceased at this point as despite additional advertisements and promotion, no further participants completed the survey. Participants’ age ranged between 18 to 64 years, where the majority of participants (43%) were in the age range of 35 to 44. Most participants performed temporary/short term work (29%). Independent contractors and workers who could get work over text or phone call ranked third in the type of gig work (25%). It was found that 33% of participants worked 4 days in a week. It was also identified that most participants worked for one employer (65%). All descriptive data are reported in Table 1.

Stress and Coping

Scores on the PSS-14 (29 ± 5.2) ranged from 18 to 39. As shown in Fig. 1, the top three state approach coping strategies indicated by scores on the Brief-COPE were planning

Table 1. Demographic characteristics of the sample (n=49)

Measure	Percentage
Gender	
Female	37
Male	63
Location	
Major city	69
Inner regional	20
Outer regional	8
Remote	2
Gig work type	
Application or digital platform based	25
Independent contractor/freelancer	20
Temporary/short term	31
On-call	18
Have a regular job and supplement with gig work	25
Can get work over text or phone call	20
Hours worked per week	
1≤ and <10	6
10≤ and <20	25
20≤ and <30	35
30≤ and <40	27
40≤ and <50	8
Days worked per week	
1	4
2	8
3	20
4	33
5	22
6	6
7	6
Number of employers	
One employer	65
More than one employer	35
Annual income (\$)	
0≤ and <20,000	22
20,000≤ and <40,000	41
40,000≤ and <60,000	27
60,000≤ and <80,000	4
80,000≤ and <100,000	2
100,000≤ and <120,000	2
120,000≤	2
Highest level of education	
Less than Year 12 or equivalent	6
Year 12 or equivalent	14
Vocational qualification (e.g., certificates)	6
Associate diploma	10
Undergraduate diploma	6
Bachelor's degree (including honours)	37
Postgraduate diploma	8
Master's degree	12
Other	0

Note: Percentage rounded to nearest whole number.

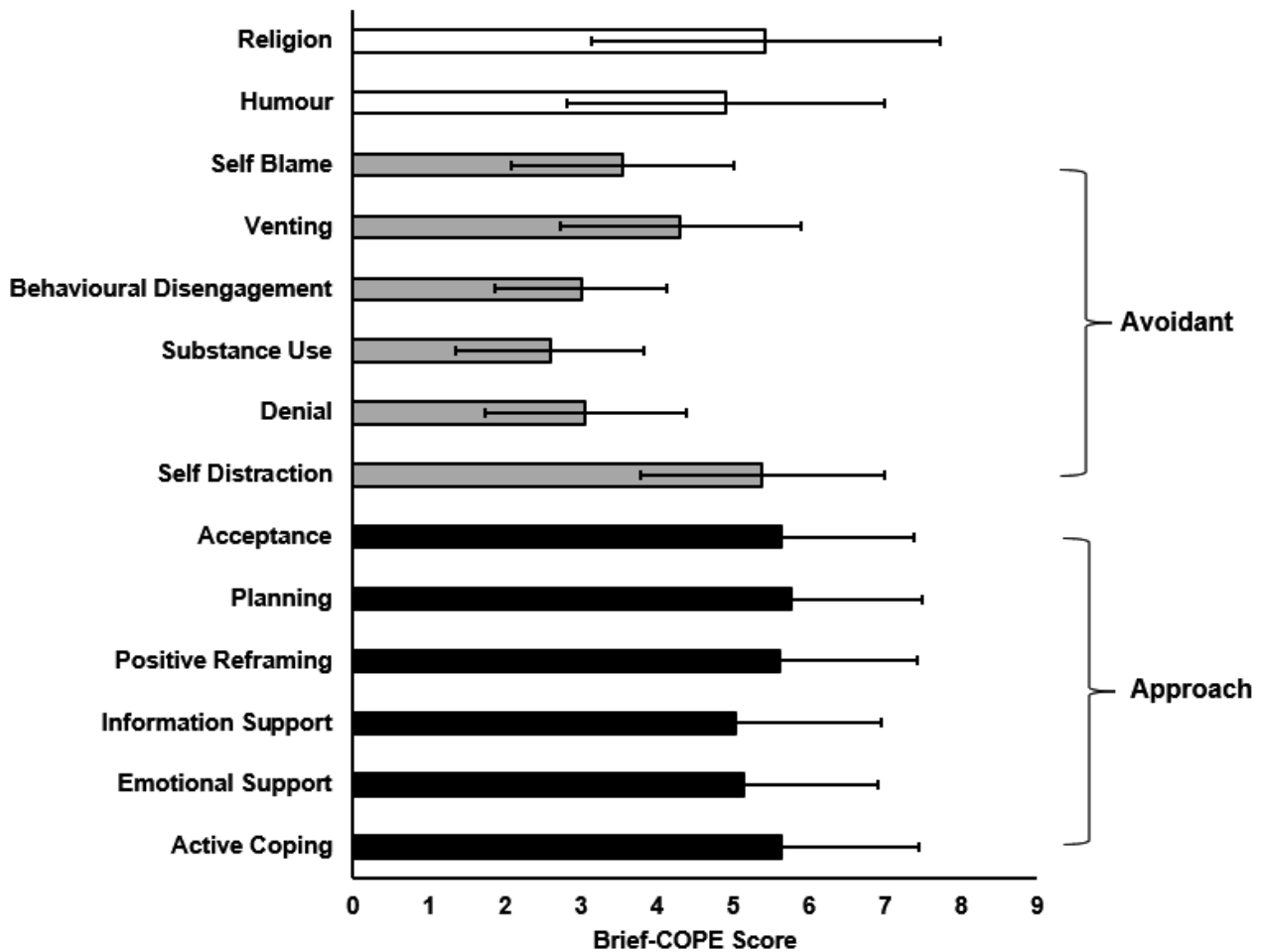


Fig. 1. Use of approach and avoidant coping strategies.
Note. Error bars = standard deviation

(5.8 ± 1.7), acceptance (5.63 ± 1.75), active (5.63 ± 1.8). The most used avoidant approach coping strategy was self-distraction (5.4 ± 1.6). The second most used avoidant coping strategy was venting (4.3 ± 1.6). The third most commonly use avoidant coping strategy was self-blame (0.5 ± 1.4). Humour (4.9 ± 2.1) and religion (5.4 ± 2.3), two sub-scales of Brief-COPE which do not belong to any of the major categories of coping strategies, were moderately used.

Stress and Working Arrangement

Mean PSS-14 scores differed slightly across the different types of reported working arrangements (digital platform -26.0 ± 5.6 ; independent contractor -29.0 ± 4.4 ; temporary/short term -31.7 ± 4.0 ; on-call -31.1 ± 2.9 ; supplement with gig work -28.2 ± 4.1 ; work via text or phone call -29.5 ± 2.1). However, sixteen participants reported engaging in more than one working time arrangement.

Stress and Weekly Work Hours

Most participants worked between 10–40 hours per week (~85%). Despite few participants indicating that they worked less than 10 hours per week ($n=3$), there was a slight trend towards greater stress when fewer hours were worked per week (0–10 h -36.3 ± 2.3 ; 10–20 h -30.8 ± 4.1 ; 20–30 h -27.3 ± 5.9 ; 30–40 h -27.9 ± 4.4 ; 40–50 h -28.0 ± 3.2 points). There was a statistically significant difference between groups, $F(4, 44) = 2.891$, $p=0.033$. Post-hoc analyses indicated a significant difference between participants who worked 0–10 hours and 20–30 hours per week ($p=0.043$).

Stress and Weekly Days Worked

Scores on the PSS-14 were very similar regardless of the number of days worked per week (one day -35 ± 0.0 ; two days -33.0 ± 4.1 ; three days -29.8 ± 3.8 ; four days -26.8 ± 6.4 ; five days -29.9 ± 2.8 ; six days -25.3 ± 1.5 ; seven

Table 2. Correlation between approach coping strategies and perceived stress

	Total perceived stress score	
	Pearson correlation	<i>p</i> -value
Active coping	-0.402**	0.002
Emotional support	-0.293*	0.02
Use of information support	-0.219	0.065
Positive reframing	-0.01	0.472
Planning	-0.255*	0.039
Acceptance	-0.121	0.204

Note: ** Correlation is significant at the 0.01 level (1-tailed).

* Correlation is significant at the 0.05 level (1-tailed).

days – 28.0 ± 5.2 points). Due to a low number of participants who reported working two days per week or fewer, or six days a week or more, groups were collapsed into the following categories: 1–3 days per week (31.3 ± 4.0 points), 4–5 days per week (28.0 ± 5.4 points), and 6–7 days per week (26.7 ± 5.4 points). However, there were no significant differences between collapsed groups, $F(2, 46) = 2.789, p=0.072$.

Socioeconomic Factors and Stress

Due to low cell numbers for participants earning above AUD\$60,000, all participants earning AUD\$40,000 and above were collapsed into one group. Reported stress was higher for individuals earning below AUD\$20,000 (32.4 ± 4.0 points), than individuals earning AUD\$20,000 – \$40,000 (28.9 ± 5.7 points), and individuals earning more than AUD\$40,000 per year (26.9 ± 4.2 points). There was a significant difference in the amount of stress reported based on annual income, $F(2, 46) = 4.382, p=0.018$. Post hoc analysis indicated that this significant finding reflected the difference between the lowest and highest earning groups, $p=0.015$.

PSS-14 scores were also significantly different based on education level obtained, $F(2, 46) = 4.827, p=0.013$. Higher scores on the PSS-14 were seen for participants who had postgraduate education (31.8 ± 2.9 points) as compared with less than a bachelor's degree (26.6 ± 5.7 points), $p=0.020$. Neither group had PSS-14 scores that were significantly different from individuals who reached the bachelor level of education (30.1 ± 4.3 points).

Relationship Between Number of Employers and Stress

An independent samples *t*-test was used to compare stress in gig workers who have one employer ($29.53, \pm 5.06$) with those who have more than one employer ($27.76, \pm 5.31$). Results of the *t*-test showed that the differ-

ence in stress levels in gig workers having one employer and those having more than one employer was not statistically significant, $t(47) = 1.14, p=0.13, d=0.34, 95\% CI [-1.34, 4.87]$.

Relationship Between Approach Coping Strategies and Stress

Results of Pearson's correlation showed that there were significant negative correlations between approach coping strategies and stress for active coping, $r(47) = -0.402, p<0.002$, emotional support, $r(47) = -0.293, p<0.02$ and planning, $r(47) = -0.255, p<0.04$. Pearson's correlations for all approach coping strategies and stress are presented in Table 2.

Relationship Between Avoidant Coping Strategies and Stress

Results of Pearson's correlation showed that there were significant negative correlations between avoidant coping strategies and stress levels for self-distraction, $r(47) = -0.300, p<0.02$, and substance use, $r(47) = -0.269, p<0.03$. However, there was a significant positive correlation for self-blame, $r(47) = 0.460, p<0.001$. Pearson's correlations for all avoidant coping strategies and stress can be viewed in Table 3.

Humour and Religion

The sub-scales humour and religion coping strategies were not statistically associated with perceived stress, $r(47) = -0.214, p=0.07$ and $r(47) = 0.13, p=0.18$ respectively.

Discussion

This study is the first to examine the relationship be-

Table 3. Correlation between avoidant coping strategies and perceived stress (n=49)

	Total perceived stress score	
	Pearson correlation	Significance
Self-distraction	-0.300*	0.018
Denial	0.21	0.074
Substance use	-0.269*	0.031
Behavioural disengagement	0.046	0.376
Venting	-0.19	0.095
Self-blame	0.460**	0.001

Note: * Correlation is significant at the 0.05 level (1-tailed).

** Correlation is significant at the 0.01 level (1-tailed).

tween coping strategies and stress in gig workers. This is a critical new area of research given the ubiquity of gig work in the current climate. The present study also examined the relationship between the number of employers a gig worker has and their perceived stress.

Findings indicated that gig workers in this sample use approach coping strategies (planning, acceptance, active coping, positive reframing) more than avoidant strategies (self-distraction, venting). Least used coping strategies included denial, substance abuse, and behavioural disengagement – all of which are classified as avoidant strategies. Approach coping strategies, including active coping, emotional support, and planning were associated with reduced stress, though use of information support, positive reframing, and acceptance (other approach strategies) were not. Self-distraction and substance use (avoidant coping strategies) were also associated with reduced stress, though the avoidant strategy of self-blame was associated with increased stress.

Though this is the first study to investigate coping in gig workers, the finding that key approach strategies are associated with reduced stress is consistent with previous research in other populations – particularly those where work-related stress is likely. For example, in a nursing population, active, planning, positive reframing, and social support coping strategies (all considered to be *approach* strategies) reduced reported stress³³. Similarly, these coping strategies have led to decreased depression, phobic anxiety and overall level of stress in teaching students³⁴. However, alternative approach coping strategies, including information support, positive reframing and acceptance, were not associated with stress reduction in the current study. While these coping strategies have been associated with reduced stress in other populations (e.g., police officers)³⁵, they may be less effective for managing the unique

stressors faced by gig workers, such as the precarious nature of the work and having multiple employers. Additionally, these approach coping strategies may be a protective factor against other outcomes - such as anxiety or depression - which were not measured in the current study. However, from the current study it appears that approach strategies such as planning, acceptance, active coping, and positive reframing could be promoted to gig workers to manage stress.

The use of two avoidant coping strategies – self-distraction and substance use – was also associated with reduced stress in the current study. This is in opposition to much of the previous literature, which generally suggests that avoidant strategies do not lead to reduced stress^{34, 36, 37}. Avoidant coping strategies are generally considered to be less effective than approach coping strategies – as they typically aim to minimise immediate feelings of stress, but do not address the underlying cause³⁸. As such, it is possible that while reducing immediate stress in the present study, these coping strategies are less effective over the long term³⁹. Furthermore, the use of substances as a coping strategy may have negative consequences such as health concerns, addiction, social issues and poor quality of life⁴⁰. Surprisingly, the only avoidant coping strategy to be associated with increased stress in the current study was self-blame, which aligns with the current literature in other working populations, such as nurses⁴¹, doctors⁴², and teachers⁴³. Like gig work, these professions are likely to result in stress. However, an argument could be made that stressors for many other professions may be associated with work tasks (e.g., stress associated with providing care for patients), as opposed to work organisation (e.g., unpredictability, financial instability). Our findings therefore suggest that self-blame should not be used as a coping strategy even when stress is associated with work organisation – rather

than work itself.

In the current study, 35% of participants reported working for multiple employers⁴⁴). Similar levels of stress were experienced by gig workers in the current study who worked for a single employer and those who worked for multiple employers. While this finding is consistent with some studies on single and multiple job holders⁴⁵), the present study is the first to examine this in a population of gig workers. Furthermore, the stress experienced by both groups (one employer and multiple employers) is considered high in the context of normative PSS-14 data³²). This suggests that, as suggested by previous literature¹²), gig workers are likely to be experiencing a higher degree of stress than the general population.

Reported stress was also associated with several socio-economic and work factors within this population, suggesting that there are characteristics of gig work (and other forms of contingent work) which are likely to be particularly problematic for workers. In particular, participants who worked fewer hours per week, who made less than AUD\$20,000 per year, and who had a higher level of education were more likely to report higher stress. This suggests that, as may be expected, financial factors are a key reason that gig workers may experience a greater degree of stress than the general population. Interestingly, participants who had obtained postgraduate education reported the most stress. Higher stress in this group may reflect the inability of these individuals to obtain steady work following their study. These individuals may perform gig work to 'pay the bills' while looking for stable employment in their chosen field. Alternatively, greater stress in this population may reflect the growing casualisation of many sectors in Australia⁴⁶).

The findings of the present study will ideally be used to inform the coping strategies used by gig workers. In particular, the use of approach coping strategies that appear to reduce stress (i.e., active coping, emotional support, and planning) in gig workers should be promoted. However, information support, positive reframing, and acceptance (other approach strategies) may be less useful for this population. The present findings also suggest that self-distraction and substance use (avoidant coping strategies) are likely to reduce stress. However, given the potentially negative outcomes of these strategies (particularly substance use), better outcomes would likely be seen where approach coping strategies were promoted instead. Information on the efficacy of these coping strategies to reduce stress in gig workers would ideally be provided by health professionals to gig workers seeking support for work-related stress.

There are several limitations that must be considered when interpreting the results of this study. In particular, the moderate sample size may restrict the generalisability of findings to gig workers more broadly. This sample size reflects difficulty in recruiting this population – who cannot be directly contacted, unlike other professions (via workplaces or professional groups). Difficulty identifying and contacting gig workers is potentially an underlying explanation for the lack of research that has been performed, to date, on gig workers. As such, future research may benefit from establishing direct relationships with digital platforms to assist with recruitment. This may also be a useful strategy for communicating potential stress management / coping strategies to gig workers – as there is currently no clear way to make contact this group, given the inherent characteristics of their working arrangements. A larger sample size in future research would also be helpful in identifying key characteristics of gig workers that may make individuals more vulnerable to psychological stress (i.e., characteristics beyond the number of employers each individual has), and what aspects of gig work are likely to result in increased stress specifically. Future research investigating the differences in state compared with trait coping strategies may also be helpful in identifying individual characteristics that may increase vulnerability to the stress associated with gig work.

Another limitation is the five working time arrangements that participants could engage in to be included in the study. While these five arrangements all reflect contingent work arrangements characterised by instability, it is possible that some types of gig workers were missed. Furthermore, it is possible that some individuals do not perform work generally considered to be 'gig work'. However, this difficulty reflects the inconsistency of the term 'gig work' in this research area, and as such the five categories were chosen to capture any individuals likely to perform work on a per-task and/or as-needed basis. Furthermore, there were many queries from prospective participants about the definition of gig work – as many workers who could be described as 'gig workers' had not heard of this term previously. As such, future studies on gig workers should consider alternative and/or additional strategies for recruitment to obtain larger sample sizes. For example, engaging directly with the relevant 'gig' platforms to contact gig workers may be a useful strategy. Furthermore, promoting snowball sampling from existing participants may be helpful. We must also note that in much of the literature, including the present study, the directionality of the relationship between coping strategies and stress is largely unknown. For exam-

ple, it may be that for individuals who experience less stress, approach coping strategies may be sufficient to cope. Conversely, it is possible that where stress is highly elevated, avoidant coping strategies may be more likely. Future qualitative research into a sample of gig workers would provide greater context to understand this potentially bidirectional relationship, while also requiring fewer participants. Despite these limitations, the present study offers several positive implications for gig workers. Most importantly, it is the first study to investigate the coping strategies used and their association with perceived stress in gig workers, and increases our knowledge base upon which to base future interventions to improve the health and well-being of gig workers.

The number of gig workers in Australia and around the world is increasing. These workers are likely to be exposed to a range of stressors – particularly relating to precarious and unstable working conditions. The findings of the present study suggest that a range of coping strategies are used by gig workers – with varying degrees of association with reduced stress. In particular, lower stress appears to be associated with certain types of both approach coping and avoidant coping – though the long-term effectiveness (and potentially negative outcomes) of some strategies must be considered. This study is the first to look at coping in gig workers and is the first step in establishing an evidence-base upon which guidance and support can be provided to this vulnerable group of workers.

Declarations of Interest

None.

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References

- 1) Madden L, Kidder D, Eddleston K, Litzky B, Kellermanns F (2017) A conservation of resources study of standard and contingent employees. *Pers Rev* **46**, 644–61.
- 2) Tran M, Sokas RK (2017) The gig economy and contingent work: an occupational health assessment. *J Occup Environ Med* **59**, e63–6.
- 3) Jossierand E, Kaine S (2019) Different directions or the same route? The varied identities of ride-share drivers. *J Ind Relat* **61**, 549–73.
- 4) De Stefano V (2017) Non-standard work and limits on freedom of association: a human rights-based approach. *Ind Law J* **46**, 185–207.
- 5) Howard J (2017) Nonstandard work arrangements and worker health and safety. *Am J Ind Med* **60**, 1–10.
- 6) Cappelli P, Keller JR (2013) Classifying work in the new economy. *Acad Manage Rev* **38**, 575–96.
- 7) Schneider D, Harknett K (2019) Consequences of routine work-schedule instability for worker health and well-being. *Am Sociol Rev* **84**, 82–114.
- 8) Bara A-C, Arber S (2009) Working shifts and mental health—findings from the British Household Panel Survey (1995–2005). *Scand J Work Environ Health* **35**, 361–7.
- 9) Rushton CH, Batcheller J, Schroeder K, Donohue P (2015) Burnout and resilience among nurses practicing in high-intensity settings. *Am J Crit Care* **24**, 412–20.
- 10) Muntaner C (2018) Digital platforms, gig economy, precarious employment, and the invisible hand of social class. *Int J Health Serv* **48**, 597–600.
- 11) Bajwa U, Gastaldo D, Di Ruggiero E, Knorr L (2018) The health of workers in the global gig economy. *Glob Health* **14**, 124.
- 12) Freni-Sterrantino A, Salerno V (2021) A plea for the need to investigate the health effects of gig-economy. *Front Public Health* **9**, 638767.
- 13) Henly JR, Lambert SJ (2014) Unpredictable work timing in retail jobs: implications for employee work–life conflict. *Ilr Review* **67**, 986–1016.
- 14) Bamberry L (2012) Multiple job holders in Australia: motives and personal impact. *Aust Bull Labour* **38**, 293–314.
- 15) Mai QD, Hill TD, Vila-Henninger L, Grandner MA (2019) Employment insecurity and sleep disturbance: evidence from 31 European countries. *J Sleep Res* **28**, e12763.
- 16) Schieman S, Glavin P, Milkie MA (2009) When work interferes with life: work-nonwork interference and the influence of work-related demands and resources. *Am Sociol Rev* **74**, 966–88.
- 17) Rivard MK, Cash RE, Chrzan K, Panchal AR (2020) The impact of working overtime or multiple jobs in emergency medical services. *Prehosp Emerg Care* **24**, 657–64.
- 18) Zickar MJ, Gibby RE, Jenny T (2004) Job attitudes of workers with two jobs. *J Vocat Behav* **64**, 222–35.
- 19) Bouwhuis S, Hoekstra T, Bongers PM, Boot CR, Geuskens GA, van der Beek AJ (2019) Distinguishing groups and exploring health differences among multiple job holders aged 45 years and older. *Int Arch Occup Environ Health* **92**, 67–79.
- 20) Lowe R, Bennett P (2003) Exploring coping reactions to work-stress: application of an appraisal theory. *J Occup Organ Psychol* **76**, 393–400.
- 21) Carver CS (1997) You want to measure coping but your protocol's too long: consider the brief cope. *Int J Behav* **4**, 92–100.
- 22) Suls J, Fletcher B (1985) The relative efficacy of avoidant and nonavoidant coping strategies: a meta-analysis. *Health Psychol* **4**, 249.

- 23) Labrague LJ, McEnroe-Petitte DM, Leocadio MC, Van Bogaert P, Cummings GG (2018) Stress and ways of coping among nurse managers: an integrative review. *J Clin Nurs* **27**, 1346–59.
- 24) Kraemer LM, Stanton AL, Meyerowitz BE, Rowland JH, Ganz PA (2011) A longitudinal examination of couples' coping strategies as predictors of adjustment to breast cancer. *J Fam Psychol* **25**, 963.
- 25) Popov B, Miljanovic M, Stojakovic M, Matanovic J (2013) Work stressors, distress, and burnout: the role of coping strategies. *Primenj Psihol* **6**, 355–70.
- 26) Singh AP (2017) Coping with work stress in police employees. *J Police Crim Psychol* **32**, 225–35.
- 27) Hoyt MA, Wang AW-T, Boggero IA, Eisenlohr-Moul TA, Stanton AL, Segerstrom SC (2020) Emotional approach coping in older adults as predictor of physical and mental health. *Psychol Aging* **35**, 591–603.
- 28) Arble E, Daugherty AM, Arnetz BB (2018) Models of first responder coping: police officers as a unique population. *Stress Health* **34**, 612–21.
- 29) Huang S, van der Veen R, Song Z (2018) The impact of coping strategies on occupational stress and turnover intentions among hotel employees. *J Hosp Mark Manag* **27**, 926–45.
- 30) Solberg MA, Gridley MK, Peters RM (2021) The factor structure of the brief cope: a systematic review. *West J Nurs Res* **44**, 612–27.
- 31) Cohen S, Kamarck T, Mermelstein R (1983) A global measure of perceived stress. *J Health Soc Behav* **24**, 385–96.
- 32) Higgins J (2011) Chapter 5: Perceived Stress Scale. In: *Cochrane handbook for systematic reviews of interventions* 3.
- 33) Burgess L, Irvine F, Wallymahmed A (2010) Personality, stress and coping in intensive care nurses: a descriptive exploratory study. *Nurs Crit Care* **15**, 129–40.
- 34) Gustems-Carnicer J, Calderón C (2013) Coping strategies and psychological well-being among teacher education students. *Eur J Psychol Educ* **28**, 1127–40.
- 35) Acquadro Maran D, Zedda M, Varetto A (2018) Physical practice and wellness courses reduce distress and improve wellbeing in police officers. *Int J Environ Res* **15**, 578.
- 36) MacIntyre PD, Gregersen T, Mercer S (2020) Language teachers' coping strategies during the Covid-19 conversion to online teaching: correlations with stress, wellbeing and negative emotions. *System* **94**, 102352.
- 37) Chen Y, Li X, Chen C, An Y, Shi J, Huang J, Zhao Y (2021) Influence of avoidant coping on posttraumatic stress symptoms and job burnout among firefighters: the mediating role of perceived social support. *Disaster Med Public Health Prep* **16**, 1476–81.
- 38) Ito JK, Brotheridge CM (2003) Resources, coping strategies, and emotional exhaustion: a conservation of resources perspective. *J Vocat Behav* **63**, 490–509.
- 39) Roth S, Cohen LJ (1986) Approach, avoidance, and coping with stress. *Am Psychol* **41**, 813.
- 40) Schulte MT, Hser Y-I (2013) Substance use and associated health conditions throughout the lifespan. *Public Health Rev* **35**, 3.
- 41) Alharbi H, Alshehry A (2019) Perceived stress and coping strategies among ICU nurses in government tertiary hospitals in Saudi Arabia: a cross-sectional study. *Ann Saudi Med* **39**, 48–55.
- 42) Doolittle BR (2021) Association of burnout with emotional coping strategies, friendship, and institutional support among internal medicine physicians. *J Clin Psychol Med Settings* **28**, 361–7.
- 43) Marais-Opperman V, van Eeden C, Rothmann S (2021) Perceived stress, coping and mental health of teachers: a latent profile analysis. *J Psychol Afr* **31**, 1–11.
- 44) Smith R, Leberstein S (2015) Rights on demand. Ensuring Workplace Standards and Worker Security In the On-Demand Economy, National Employment Law Project, Washington DC.
- 45) Bouwhuis S, Geuskens GA, Boot CR, van der Beek AJ, Bongers PM (2019) Health differences between multiple and single job holders in precarious employment in the Netherlands: a cross-sectional study among Dutch workers. *PLoS One* **14**, e0222217.
- 46) Laß I, Wooden M (2020) Trends in the prevalence of non-standard employment in Australia. *J Ind Relat* **62**, 3–32.