

ACCEPTED MANUSCRIPT

**Work-Life Balance of UK Construction Workers: Relationship with Mental Health**

Citation

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## Abstract

Although the importance of work-life balance (WLB) is related to occupational psychological outcomes in many countries and industries, these relationships have not been explored in UK construction industry, a major sector of the UK economy. This workforce suffers from high rates of mental health problems and low help-seeking. Accordingly, the purposes of this study were to explore relationships between WLB, mental health, attitudes towards mental health problems, along with work schedules. One hundred and forty-four UK workers in the construction industry completed measures of those three constructs. WLB was negatively associated with mental health problems, and mental health attitudes. Mental health attitudes did not mediate the relationship between WLB and mental health problems with a small effect size. WLB was the strongest predictor of mental health problems. Mental health problems scores differed by work pattern groups; day time workers had poorer mental health than mixed workers. Findings will help UK construction workers, employers, and organisational researchers deepen their understanding of WLB and identify better solutions to poor WLB and mental health.

Keywords: work-life balance, mental health, mental health attitudes, role theory

## Introduction

### *Importance of Work-Life Balance Among Workers*

Work-life balance (WLB), organisation's support for its employee's personal life provided by various schemes including flexible work hours, child and dependent care, and leave for a family or personal reason (Beauregard and Henry, 2009; Estes and Michael, 2005), has been an important issue for both employers and employees in modern society (Nizam and Kam, 2018). Maintaining good WLB has been endorsed by the government for all employees in the UK (Department for Business, Innovation and Skills, 2011), and the benefits of good WLB have been reported by the European Commission, particularly parental leave, breastfeeding provision, and flexible working (Vaganay et al., 2016). Since Caplow's (1954) initial sociological research, many social and organisational researchers have investigated WLB. Female workers' increased involvement in workplaces since the 1960s (Naithani, 2010; Zheng et al., 2015) along with family commitments were recognised as causing work-family conflict and unsustainable, poor WLB (Manfredi, 2006). In contrast, flexible work hours and locations could result in better WLB (Hill et al., 2001), leading to good balance of time, satisfaction, and involvement in both work and life (Greenhaus, et al., 2003). Poor WLB was associated with higher levels of psychological distress at an individual level (Aazami et al., 2015), and decreased work productivity at an organisational level (Mendis and Weerakkody, 2014). Further, poor WLB can cause lower birth rates, lowering population sustainability, which results in increased stress and decreased quality of life among workforces (Lewis et al., 2007). Similarly, in the construction industry, WLB is important for the organisational productivity and employees' wellbeing (Lingard et al., 2007).

Between 1999 and 2007 about 30% of European workers, equating to 56 million workers, noted that their mental wellbeing was affected by exposure to psychosocial risks, of

which the most common was poor WLB (Eurostat, 2007). Among workers with a work-related health problem, high levels of mental health problems (depression, anxiety, and stress) were considered the most serious problem (Eurostat, 2010). Eighty percent of European managers are aware of high levels of mental health problems in their workplaces, however more than 70% of European organisations do not have procedures to cope with them, hence almost half of European managers find mental health risk factors harder to manage than other occupational health risk factors (European Agency for Safety and Health at Work [EU-OSHA], 2010). Mental health risk factors include excessive workload and work pace, inflexible work schedules, irregular, unpredictable or unsocial work hours, and conflicting demands of work and home - all of which are related to WLB (Cox, 1993). Protracted exposure to those risk factors is associated with poor mental health and reduced work performance in workplaces (Hassard et al., 2014), and reduced quality of life and relationship with family in personal lives (Amick and Mustard, 2005; Hoel et al., 2001). Employers are legally responsible for reducing employees' health and safety risks (see the European Framework Directive: 89/391/EEC), and failure to address these risks can be costlier for employers, employees, and the societies (Bond et al., 2006). Though many European countries have national health care systems, poor WLB and its negative impacts can still lead to reduced income at an individual level: taking prolonged leaves and early retirement (Eurofound, 2011). Indeed, some countries offer occupational compensation for employees who have experienced work-related mental health problems; however, the procedure to apply for and receive them can be daunting to many applicants (Kieffer, 2013). At an organisational level, mental health risk factors are related to poor productivity, high absenteeism and employee turnover. And in the UK, occupational mental health problems caused 16 million lost working days in 2016 (Office for National Statistics [ONS], 2017a), costing employers £40 billion and the government £25 billion annually, over 3% of GDP

(Steven and Farmer, 2017). Lastly, the benefits of good WLB include more engagement (a contributing factor to increased work productivity; Grover and Crooker, 1995), job satisfaction, employee retention, better recruitment outcomes (Caspar and Buffardi, 2004; Matos and Galinsky, 2014), and higher returns for shareholders (Arthur and Cook, 2004). These findings regarding the positive and negative impacts of WLB highlight the importance of further investigation.

Unsurprisingly there have been numerous theories to elucidate this important concept. Conflict theory is centred around the incompatibility of one's role pressures in work and family lives: more work commitment makes it challenging to maintain the family role (Greenhaus and Beutell, 1985). Though the original conflict theory was a one-way model, it is now more commonly regarded as two-way (i.e., work hampers family life, and vice versa; Frone et al, 1992). Because work-family conflict is often present in employees, work's interference with family is emphasised (Kelly et al., 2008). Spill-over theory is based on interactions between work and family, which can increase similarities between these two domains (Edwards and Rothbard, 2000). Affective spill-over refers to one's mood in one domain affecting their mood in the other domain (i.e., a worker feeling well at home will feel well at work too, and vice versa; Illies et al., 2009), while instrumental spill-over refers to one's behaviours and skills in one domain carried to the other (i.e., a worker's organisational skills used at work are utilised at home too; Edwards and Rothbard, 2000). Other WLB theories include: structural functionalism theory which suggests radical separation between work and family (Kingsbury and Scanzoni, 1993); ecology system theory which proposes that the environmental effects one experiences affects work and life (Grzywacz and Marks, 2000), resource drain theory; theorising that a worker balances their limited resources such as time, money and attention, between work and life (Edwards and Rothbard, 2000); and so on.

One established theory in WLB, relating to employee mental health, is Role Theory, focusing on the roles an employee has in their workplace and personal life (Marks, 1977; Pradhan, 2016). One of the two hypotheses of this theory is the scarcity hypothesis (Marks, 1977), which proposes that the quantity of time and energy an individual has is fixed. Therefore, an increase in roles can lead to role conflicts (i.e., a scarcity of time and energy per role), causing overload and negative consequences including poor mental health, performance, and work motivation (Grant-Vallone and Donaldson, 2010; Hafiz, 2015). One's roles, which are a large component of meaningfulness in their lives (Simon, 1997), were associated with mental health (i.e., a strong sense of professional roles was associated with mental health problems; Kotera et al., 2018b). Having numerous roles was associated with mental distress (Cojocaru et al., 2018), and sacrificing personal activities for work was related to negative emotions such as guilt and shame, and lower life and work satisfaction (Dahm et al., 2019). On the other hand, the enrichment hypothesis in Role Theory suggests that an increase in roles is beneficial to our well-being: workers who fulfil multiple roles (i.e., role accumulation) were had lower levels of mental health problems and better well-being (Barnett and Hyde, 2001). Role accumulation can support one's resources, social belongingness, and emotional gratification (Marks, 1977; Thoits, 1983). High levels of work and life satisfaction are related with one's happiness and perceived quality of life (Rice et al., 1992). Also, the enrichment hypothesis claims that role accumulation can be safer, as distress in one role can be buffered by satisfaction in the other roles. One's overall well-being was maintained from stressful work experience, if their personal life was fulfilling, and vice versa (Barnett et al., 1999). Lastly, as with the spill-over theory, experiences in one role can be transferred to the other roles to produce positive outcomes (e.g., being a mother trained her listening skills, which were useful as a manager; Ruderman et al., 2002). Role Theory places these hypotheses as opposing to each other: the scarcity hypothesis relates role accumulation

with poorer mental health, whereas the enrichment hypothesis relates role accumulation with better mental health (Greenhaus and Powell, 2006). However, we believed that WLB might be able to offer insights in this relationship between the two hypotheses: regardless of the degree of role accumulation, when an employee's WLB is good, their mental health is also good (i.e., less mental health problems), and vice versa. Accordingly, we hypothesised that their WLB would be negatively correlated with their mental health problems (Aim 1, see Figure 1).

[Figure 1 near here]

### ***UK Construction Workers' Poor Mental Health and Low Help-Seeking***

Construction workers are involved with repair, additions, and modifications of diverse enterprises for buildings and public engineering works (ONS, 2015). The UK construction industry produces 6% of the economic output (£150 billion) and employs 8% of the national workforce (2.7 million workers; Statista, 2018), but has many workers who suffer from poor mental health; the ratios of construction workers who have experienced psychological distress are more than twice the national average: 55% of UK construction workers have experienced mental health problems in their lives, and 42% of them suffer from them at their current workplace (42% in construction and 17% in general workers; Alderson, 2017). Relatedly, contrary to the on-site accident deaths (which have reduced substantially from 200 to 40 in the past 60 years), the incidence of suicide has been constant at around 300 per year (Sanderson, 2017), higher than any other industry (13% of all work-related suicides; ONS, 2018): more construction workers end their lives for a lack of psychological safety than physical safety. In the country, work mental health has been highly focused upon, as the total costs of poor mental health at work were enormous, estimated to be £74 to 99 billion per year (Stevenson and Farmer, 2017). Though we could not retrieve a cost estimate of mental health

problems in the construction industry, considering its magnitude and challenging mental health status, it would not be negligible.

In spite of their poor mental health, help-seeking of workers in the UK construction is low. Only 40% of them told their boss about their mental health problems, when they took a leave due to mental distress (Alderson, 2017). Low-skilled male construction workers were three times more likely to commit suicide than the male national average in the UK (ONS, 2017b). Almost all (90%) employees in this industry who have had suicidal thoughts or known someone who committed suicide, did not seek help because of shame (Alderson, 2017). Previous research has also found that shame serves as an obstruction for help-seeking among students (Kotera et al., 2018b) and workers (Kotera et al., 2018a). Low help-seeking was associated with high emotional exhaustion among 222 Hong Kong construction workers (Yip et al., 2008), highlighting employees' sensitivity to maintaining a front, due to fear of losing credibility by expressing negative emotions at work (Rowlinson and Root, 1996). Moreover, they identified a lack of organisational support for a good WLB in the construction industry, which moderated the relationship between work-to-family conflict and emotional exhaustion (Lingard and Francis, 2006). Indeed, shame was present in WLB as well: 'walk of shame' (i.e., shame associated with leaving work early due to a personal/family issue) was reported among Australian construction workers (Turner et al., 2009, p.100). To address high shame in the industry, a smart-phone intervention, where participants undertook mental health education offered in texts and videos on their smart-phone, was provided to construction workers. However it did not yield significant findings, possibly due to statistical power or because of the complexity of shame and stigma; they highlight the need for better understanding of shame in this workforce (Milner et al., 2018). Accordingly, the current study focused on mental health problems, and shame-based attitudes towards mental health problems ('mental health attitudes') among workers in the UK

construction industry, in relation to WLB: how much impact mental health attitudes would have on the relationship between WLB and mental health problems (Aim 2, see Figure 2).

[Figure 2 near here]

### ***Work Schedule and Mental Health***

Work schedule (i.e., the times and days an employee is supposed to be working) has been reported to be related to the mental health of workers (Worrall and Cooper, 1999). For example, non-standard work hours (e.g., night or weekend work) negatively impact on employee mental health (Wildes, 2005), and a longitudinal study in the Netherlands reported that using the company policy for exemption from evening and night shifts increased work engagement among senior workers, a construct related with good mental health ( $n=6922$ ; van der Meer et al., 2015). Similarly, highly motivated workers who believe their work is a calling tend to work long hours, which is related to their diminished sleep, leading to poor mental health (Clinton et al., 2017). Long working hours were associated with sleepiness at work, increasing the risk of accidents among construction workers (Wilhelm et al., 2010). Irregular working hours and witnessing colleagues' fatigue were negatively associated with an overall sense of safety in the construction workplaces, which was a key factor contributing to employee engagement and productivity (Whiteoak and Mohamed, 2016). Non-standard work hours can damage WLB and well-being (Ulker, 2006). Weekend work, a major source of dissatisfaction in Australian construction workers (Lingard and Francis, 2002), was associated with burnout, stress, and mental health problems (Jamal, 2004) as well as work-family conflict (Hosking and Western, 2008), which was a mediator in the relationship between schedule demands (i.e., work hours and irregularity) and emotional exhaustion in male Australian construction workers (Lingard and Francis, 2005).

Furthermore, non-standard work hours can affect their family life too: non-standard work hours can affect marital quality negatively among shift workers (White and Keith, 1990), causing high divorce rates (Presser, 2000). Parents working non-standard work hours experience more depressive symptoms, and their children are more likely to encounter emotional difficulties (Strazdins et al., 2006). High family-work conflict was deemed to be related to negative attitudes towards mental health problems in hospitality workers (Kotera et al., 2018a). Alternative work hours, such as compressed work week, were introduced to this industry; however, the effects were ambiguous: compressed work week helped employees' WLB and organisational efficiency in Australian construction workers (Lingard et al., 2007), whilst such work hours can create problems for waged workers who would have to give up their weekend shifts (that pay more), causing managers' stress (Townsend et al., 2012). This may suggest a need for deeper understanding of WLB, mental health problems, and mental health attitudes in construction workers, relating to work location and work schedule. These relationships have not been explored in UK construction workers, who work a variety of work hours (Oswald et al., 2017) (Aim 3).

### *Aims*

This study aimed to explore relationships between their WLB, mental health problems, and mental health attitudes (Aim 1, Figure 1), investigate the impact of mental health attitudes on the relationship between WLB and mental health problems (Aim 2, Figure 2), and examine whether WLB, mental health, and mental health attitudes would differ in different work schedule groups (Aim 3).

## **Method**

### *Settings and Samples*

The organisations that participated in this study are engaged in highway construction and specialise in works with major government-owned highway organisations in England and Wales. This collaborative community has been formed comprising over 20 different construction companies, delivering maintenance works on motorways and trunk roads in the East Midlands in the UK. Approximately 1,000 participants were approached through their managers and through flyers; they were construction workers who were 18 years old or older and had at least one-year work experience in the industry. One hundred sixty full-time workers agreed to participate and 144 (127 males and 17 females; age range 21-67,  $M_{\text{age}}=40.38$ ,  $SD_{\text{age}}=10.90$  years) completed the self-report measures about WLB, mental health problems, and mental health attitudes. This sample size satisfied the required size based on power calculation (114; Faul et al., 2009). Their work experience ( $M_{\text{WE}}=15.42$  years,  $SD_{\text{WE}}=10.77$  years) and weekly working hours ( $M_{\text{WWH}}=48.99$  hours,  $SD_{\text{WWH}}=9.60$  hours) were reported. The largest proportion of them ( $n=71$ ; 49%) worked at site-based locations, followed by office ( $n=57$ ; 40%) and other sites such as mixture of sites and office ( $n=16$ ; 11%). The majority of them worked during the daytime with irregular night shifts ( $n=52$ ; 36%) and without night shifts ( $n=38$ ; 26%). The rest of working hours included combination of day and night shifts ( $n=26$ ; 18%), night only ( $n=15$ ; 10%), and night shifts with irregular day time work ( $n=13$ ; 9%). About one-third were managers ( $n=53$ ; 37%), a quarter were foremen/supervisors ( $n=33$ ; 23%), and one-fifth were operatives ( $n=26$ ; 18%); the rest were technical professionals ( $n=19$ ; 13%) and others ( $n=13$ ; 9%) including directors and administrative staff. These choices regarding their work locations, schedules, and roles in the demographic questionnaire were determined based on consultation with construction managers. Sixteen percent of them had undertaken some mental health training, and 15% had received professional care for their own mental health problems in the past.

### ***Instruments***

Work-Life Balance Checklist 7 (WLBC7) consisted of seven items regarding an employee's WLB (e.g., 'At the moment, because the job demands it, I usually work long hours'), responded by one of the three responses: A='Agree', B='Sometimes', and C='Disagree' (Daniels and McCarraher, 2000). Predominantly A responses indicate poor WLB, whereas mostly C responses indicate good WLB. For the purposes of this study, the responses were changed to a five-point Likert scale (1='Agree', 3='Sometimes', and 5='Disagree'), where higher scores would indicate better WLB. WLBC7 had adequate internal consistency ( $\alpha=.66$ ; Daniels and McCarraher, 2000).

Depression Anxiety and Stress Scale (DASS21) is a shortened version of the DASS42 (Lovibond and Lovibond, 1995), comprising 21 items on a four-point Likert scale (0='Did not apply to me at all' to 3='Applied to me very much or most of the time'), measuring the levels of mental health problems. Seven items are allocated to three subscales: depression (e.g., 'I couldn't seem to experience any positive feeling at all'), anxiety (e.g., 'I was aware of dryness of my mouth') and stress (e.g., 'I found it hard to wind down'). The DASS21 subscales have good reliability ( $\alpha=.87-.94$ ; Antony et al., 1998).

Attitudes Towards Mental Health Problems (ATMHP) consists of 35 items on a four-point Likert scale (0='Do not agree at all' to 3='Completely agree'), evaluating attitudes towards mental health problems (i.e., mental health attitudes). ATMHP incorporates four sections: (i) how their community and family perceive mental health problems (community and family attitudes; e.g., 'My community/family sees mental health problems as something to keep secret'), (ii) how their community and family would perceive them if they had a mental health problem (external family/community shame; e.g., 'I think my community/family would look down on me'), (iii) how they perceive themselves if they had a mental health problem (internal shame; e.g., 'I would see myself as inferior'), and (iv) how their family would be perceived if they had a mental health problem (family-reflected shame;

e.g., 'My family would be seen as inferior'), and how you would be perceived if your family member had a mental health problem (self-reflected shame; e.g., 'I would worry that others will look down on me'). All subscales had good internal consistency ( $\alpha=.85-.97$ ; Gilbert et al., 2007).

### ***Procedure***

An introduction meeting was held by the researchers for managers and team leaders at the collaborative community, explaining the purposes and procedure of the study. The study information and consent were then distributed to their organisations by the managers and leaders, followed by a link to the online scales once consent was submitted. For the participants who preferred paper-based survey, the hardcopies of these materials were given by the managers and leaders. They were given one month to respond to the survey at anytime and anywhere they liked, considering their shame about mental health problems. After participants responded to all questions, the debrief was presented to them. For the participants' protection, information about available mental health support inside and outside the industry was provided. Ethics approval was obtained from the University Research Ethics Committee.

### ***Data Analysis***

This study employed a cross-sectional design. First, data screening for outliers was conducted, then the assumption of normality and homogeneity of variances were examined. Second, a correlation analysis was completed in order to explore relationships between WLB, mental health problems, and mental health attitudes (Aim 1). Third, path analyses were conducted to assess whether mental health attitudes would mediate the relationship between WLB and mental health problems (Aim 2). Fourth, one-way MANOVA was conducted to determine if night shift workers had poorer WLB, mental health problems, and mental health

attitudes, than workers in the other work schedules (Aim 3). IBM SPSS version 24.0 and Process macro version 3 (Hayes, 2017) were used for the analyses.

## Results

### *Descriptive Statistics*

Six score in family external shame and five scores in anxiety were identified as outliers using the outlier labelling rule (Hoaglin and Iglewicz, 1987), and so were winsorised (Tukey, 1962). Internal consistencies for all of the scales and subscales were high ( $\alpha \geq .81$ ; Table 1).

[Table 1 near here]

### *Relationships between WLB, Mental Health, and Mental Health Attitudes (Aim 1)*

The ATMHP subscales were summed sectionally due to their high internal consistencies (Gilbert et al., 2007): ‘negative attitudes’ (community and family attitudes), ‘external shame’ (community and family external shame), and ‘reflected shame’ (family-reflected shame and self-reflected shame). As the data were not normally distributed, indicated by the Kurtosis and Skewness values and significant Shapiro-Wilk's tests ( $p < .05$ ), they were square-root-transformed.

[Table 2 near here]

WLB was negatively associated with mental health problems, mental health attitudes. This corresponded to the scarcity hypothesis.

[Figure 3 near here]

### *Mental Health Attitudes as a Mediator between WLB and Mental Health Problems (Aim 2)*

To examine the impact of mental health attitudes on the relationship between WLB and mental health problems, path analyses were conducted (WLB as a predictor variable, and mental health problems as an outcome variable).

[Figure 4 near here]

There was not a significant indirect effect of WLB on mental health problems through mental health attitudes,  $b=-.10$ , BCa CI  $[-.27, .01]$ , which accounted for 14% of the total effect, indicating a small effect. The direct effect of WLB on mental health problems, controlling for mental health attitudes, was significant,  $b=-.59$ ,  $t(141)=-2.95$ ,  $p=.004$ , implying that WLB directly predicted the variance in mental health problems and that mediation was partial. The total effect of WLB on mental health problems, including mental health attitudes, was significant,  $b=-.69$ ,  $t(142)=-3.33$ ,  $p=.0011$ . Controlling for mental health attitudes, 7% of the variance in mental health problems was explained by WLB. Mental health attitudes did not mediate the relationship between WLB and mental health problems.

### ***Difference in WLB, Mental Health Problems, and Attitudes among Work Schedules (Aim 3)***

A one-way MANOVA was run to determine the effect of different work schedules on WLB, mental health problems, and mental health attitudes (Table 3). There was homogeneity of variance-covariances matrices, as assessed by Box's test of equality of covariance matrices ( $p=.19$ ). There was a statistically significant multivariate difference between the different work schedules on the dependent variables,  $F(12, 362.76)=2.98$ ,  $p=.02$ ; Wilks'  $\Lambda=.84$ ; partial  $\eta^2=.06$ . Follow-up univariate ANOVAs showed that mental health problems ( $F(4, 139) = 4.34$ ,  $p=.002$ ; partial  $\eta^2=.11$ ) was statistically significantly different between workers working different work schedules, using a Bonferroni adjusted  $\alpha$  level of .01. Tukey post-hoc tests revealed that for mental health problems, day time workers had higher mean scores (indicating poor mental health) than workers who routinely work day times with some night shifts and who work a mixture of day and night shifts ( $p<.01$ ).

[Table 3 near here]

## Discussion

This study focused on relationships between WLB, mental health problems, and mental health attitudes (Aim 1), the impact of mental health attitudes on the relationship between WLB and mental health problems (Aim 2), and difference in WLB, mental health problems, and mental health attitudes among different work schedule groups of UK construction workers (Aim 3). Our correlational analysis revealed that WLB was negatively related to mental health problems and mental health attitudes, supporting both of the scarcity hypothesis and the enrichment hypothesis of Role Theory. Our path analysis found that mental health attitudes had little impact on the relationship between WLB and mental health problems. Lastly, MANOVA identified differences in mental health problems among different work schedule groups. We will discuss each finding in turn below.

WLB was negatively associated with mental health problems, and mental health attitudes: construction workers with good WLB tend to have less mental health problems, and less negative attitudes towards mental health problems. As previously reported in other industries (Caspar and Buffardi, 2004; Grover and Crooker, 1995; Matos and Galinsky, 2014), good WLB was related to better mental health in the construction industry too. The relationship between WLB and mental health attitudes implies psychological safety of construction workers: those who feel psychologically safe in a workplace may feel comfortable leaving work for their family or personal concerns and believe that their colleagues do not perceive mental health problems negatively, and vice versa (Wanless, 2016). Psychological safety has been the focus of increasing organisational research, due to its relation to other psychological outcomes and productivity (Graham, 2016). WLB may be conducive to psychological safety, both of which are associated with mental health. One theoretical framework for WLB is social exchange theory: you want to give back, when you receive something (Blau, 1964). This could explain why in psychologically safe workplaces,

trust is exchanged among employees (Beauregard and Henry, 2009). Trust at a workplace is related to better engagement, higher productivity, and less mental distress (Zak, 2011). Trust in a construction workplace can be augmented by fostering good colleague communication (especially with their supervisor) and a workforce-friendly atmosphere (Shen et al., 2015). Reviewing those aspects of a construction workplace may be the first step towards stronger psychological safety, leading to better WLB and better mental health. Future research needs to explore these relationships in order to elucidate further benefits of good WLB for construction workers.

The scarcity hypothesis and the enrichment hypothesis in Role Theory may be better understood by considering employees' sense of WLB. In our results, the difference between these two hypotheses was deemed to be relevant to WLB. While Role Theory left the difference rather ambiguous, our findings suggest that the difference may be related to WLB: regardless of the level of their role accumulation, if an employee perceives their WLB to be good, they also rate their mental health as good (which corresponds to the enrichment hypothesis) and vice versa (which corresponds to the scarcity hypothesis). Indeed, high role accumulation may be more related to lower WLB, which was related to poor mental health in our sample); however, this would not support the enrichment hypothesis. Further, more specificity may be needed in role accumulation. For example, Kikuzawa (2006) reported the enriching effects of role accumulation on mental health in both Japanese and US samples, however the samples were all 60 years old or older. It makes sense that among seniors, having another role can give them a sense of fulfilment leading to better mental health, as seen in 'ikigai (meaning of life)' research (Sone et al., 2008). The same may apply to new workers who aspire to be promoted in the organisation; they may feel better to have additional roles. Role Theory still leaves these ambiguities, but our findings may offer

insights into these ambiguities: how much an employee believes they have a good WLB may determine whether the scarcity hypothesis or enrichment hypothesis apply.

Our path analyses yielded that while the direct and total effects of WLB on mental health problems were significant, mental health attitudes did not mediate the relationship between WLB and mental health problems (non-significant indirect effects). Mental health attitudes only had a small impact on the relationship, and WLB's effects on mental health problems were stronger than mental health attitudes'. This suggests the importance of WLB in relation to mental health, and a strong predictive relationship between WLB and mental health (Cox, 1993). Work-life fit, an employee perceives to have enough recourses to meet demands in their work and non-work roles, was crucial to construction workers' wellbeing, and flexible work practices were recommended to enable workers to access the services (e.g., even though an organisation supports child-care, inflexible work practices may not allow workers to access the service; Turner and Lingard, 2016). Additionally, positive relations between the employees' positive emotions toward their work and their families' perception toward their work have been reported (e.g. Wayne et al., 2013). Considering construction workers' diverse working places and hours, it may be difficult to arrange, however company events involving employees' families could improve their WLB, leading to reductions in work-family conflict. Future research should explore the effects of these events on WLB and mental health.

Our findings can contribute to a deeper understanding of Role Theory and the scarcity hypothesis in relation to WLB. There was a strong relationship between WLB and mental health problems, which would be interpreted, using this theory, that poor WLB may cause workers' role conflict, resulting in more mental distress (Marks, 1977). Given that 86% of the total effect of WLB on mental health problems were its direct effect (Figure 2), in line with previous findings (Grant-Vallone and Donaldson, 2010; Yang et al., 2018), WLB may be the

primary predictor of workers' mental health. In our sample, mental health attitudes predicted mental health problems, but not as strongly as WLB. The opposite construct of the scarcity hypothesis is the enrichment hypothesis, where an improvement in one area enriches the other (Carlson et al., 2006). Again, creating a (not only physically but) psychologically safe workplace may help achieve good work-life fit, leading to better wellbeing in construction workers, in line with the enrichment hypothesis (Turner and Lingard, 2016). Further, encouraging employee autonomy and improving relationships with supervisors were recommended as ways to increase work-life enrichment (Lingard et al., 2010). Future research should explore work-life enrichment of the construction industry workforce.

Among different work schedules, mental health problems scores were different, while WLB and mental health attitudes scores were not. Significant differences in mental health problems among different work schedule groups is consistent with UK hospitality workers (e.g., hotel and restaurant workers). Indeed, day time workers had a significantly higher mean mental health problems score than workers who routinely work day time with some night shifts, and mixed workers. This suggests that working at regular times may be related to poor mental health, while working at a flexible time may be related to better mental health, which is consistent with some previous findings (Oshio et al., 2017; Whitehouse, 2018) and the country's initiatives (e.g., Children and Families Bill, legislated in 2014). However, our data do not indicate whether working schedules were the participants' choices, or were assigned by the employer, or were negotiated. Indeed, individuals with mental health problems may have been less able to negotiate their preferred working pattern (Hindmarch et al., 2013). Future research should explore these relationships in depth, including the causality between work arrangements (e.g., work schedule) and mental health.

There were some limitations to this study. Firstly, participants were recruited through opportunity sampling via personal contacts and snowball sampling, limiting the

generalisability of the findings. Secondly, though no correlation was found between shame and perceived risk of disclosing personal information in UK samples (Gilbert et al., 2007), measuring shame using self-report measures might compromise their accuracy (e.g., social desirability bias; Latkin et al., 2017). Third, due to the small number of the participating female workers (n=17), this study did not report meaningful findings about male-female differences (we conducted an ANOVA but no difference was found in WLB  $F(1, 142)=1.31$ ,  $p=.25$ ). Future studies should recruit more female workers to explore gender difference in this male-dominant industry. Fourth, because there were not so many comparative data sets of some of the scales used in this study (i.e., WLB, ATMHP, as opposed to DASS21), we could not make meaningful comparison with other industry workers. Future research should compare the data reported here with other industries. Lastly, the direction and causality of these relationships has not been investigated. In the future, longitudinal studies would help elucidate the temporal patterning of the observed relationships and may help develop interventions that would elucidate our understanding of causality.

Despite plentiful benefits of good WLB, including mental health, these relationships had not been explored in UK construction industry, a major workforce in the country. This was the first ever study to explore WLB, mental health problems, and mental health attitudes in UK construction workers. Our findings suggest that: (i) WLB, mental health problems, mental health attitudes were related to each other; (ii) mental health attitudes were not a mediator of the relationship between WLB and mental health problems, and that WLB was the strongest predictor of mental health problems; and (iii) day time workers had higher mental health problems scores than workers who had some variations in their work hours. Future longitudinal studies would help elucidate the temporal patterning of these relationships and aid the development of beneficial interventions.

## References

- Aazami, S., Shamsuddin, K., and Akma, S., 2015. Examining behavioural coping strategies as mediators between work-family conflict and psychological distress. *Scientific world journal*, 1-7.
- Alderson, L., 2017. *Uncovered: The truth behind construction's mental health* [online]. London, Construction News. Available from <https://www.constructionnews.co.uk/10019419.article> [accessed 23 May 2017].
- Antony, M.M., Bieling, P.J., Cox, B.J., Enns, M.W., and Swinson, R.P., 1998. Psychometric properties of the 42-item and 21-item versions of the Depression Anxiety Stress Scales in clinical groups and a community sample. *Psychological assessment*, 10(2), 176-181.
- Amick, B.C. and Mustard, C., 2005. Labour markets and health: A social epidemiological view. In S. Bianchi, L.M. Casper, and R. Berkowitz King, eds. *Work, family, health and well-being*. Mahwah, NJ. Lawrence Erlbaum Associates, 413-433.
- Arthur, M.M. and Cook, A., 2004. Taking stock of work-family initiatives: How announcements of “family-friendly” human resource decisions affect shareholder value. *ILR review*, 57(4), 599-613.
- Barnett, R.C. 1999. A new work-life model for the twenty-first century. *Annals AAPSS*, 562, 143-158.
- Barnett, R.C., and Hyde, J.S. 2001. Women, men, work, and family: An expansionist theory. *American Psychologist*, 56, 781–796.
- Beauregard, T.A. and Henry, L.C., 2009. Making the link between work-life balance practices and organizational performance. *Human resource management review*, 19(1), 9–22.
- Blau, P. (1964). *Exchange and power in social life*. New York, NY: Wiley.

- Bond, F.W., Flaxman, P.E., and Loivette, S. (2006). *A business case for the management standards for stress*. Health and Safety Executive. Available from <http://www.hse.gov.uk/research/rrpdf/rr431.pdf> [accessed 23 May 2017].
- Caplow, T., 1954. *The Sociology of Work*. Minneapolis, MN: University of Minnesota Press.
- Carlson, D.S., Kacmar, K.M., Wayne, J.H., and Grzywacz, J.G., 2006. Measuring the positive side of the work-family interface: Development and validation of a work-family enrichment scale, *Journal of Vocational Behaviour*, 68, 131-164.
- Caspar, W.J., and Buffardi, L., 2004. Work-life benefits and job pursuit intentions: The role of anticipated organizational support, *Journal of vocational behavior*, 65, 391–410.
- Clinton, M.E., Conway, N., and Sturges, J., 2017. "It's tough hanging-up a call": The relationships between calling and work hours, psychological detachment, sleep quality, and morning vigor, *Journal of Occupational Health Psychology*, 22(1), 28-39.
- Cojocar, N., Saitan, V., and Hodonoaga, T. 2018. Managing multiple challenging roles: Family, work and professional development. *Studia Universitatis Moldaviae*, 9(119), 130-133.
- Constructing Excellence., 2009. *Better ways of working: Flexible working*. London: Author.
- Cox, T., 1993. Stress research and stress management: putting theory to work, *HSE contract research report*, 61/1993.
- Dahm, P., Kim, Y., and Glomb, T., 2019. Leaning in and out: Work–life tradeoffs, self-conscious emotions, and life role satisfaction. *The Journal of Psychology*. doi: 10.1080/00223980.2019.1566685.
- Department for Business, Innovation and Skills, 2011. Extending the right to request flexible working to all: impact assessment. Available from [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data)

/file/31554/11-744-extending-right-to-request-flexible-working-impact.pdf [accessed 23 May 2017].

Devi., K. and Kiran, U. 2014. Work life balance of women workers in construction industry. *European Academic Research*, 2(4), 4932-4946.

Edwards, J.R. and Rothbard, N.P. 2000. Mechanisms linking work and family: Clarifying the relationship between work and family constructs. *Academy of Management Review*, 25(1), 178-199.

Estes, S.B. and Michael, J., 2005. Work-family policies and gender inequality at work.

Philadelphia, PA: Work and Family Researchers Network. Available from

<https://workfamily.sas.upenn.edu/wfrn-repo/object/q8hs4no9i934jm6r> [accessed 23 May 2017].

Eurofound, 2011. *European foundation for the improvement of living and working conditions, work related stress*. Available from

<https://www.eurofound.europa.eu/observatories/eurwork/industrial-relations-dictionary/european-foundation-for-the-improvement-of-living-and-working-conditions-eurofound> [accessed 23 May 2017].

European Agency for Safety and Health at Work, 2010. *European survey of enterprises on new and emerging risks: managing safety and health at work*. Available from

[https://osha.europa.eu/en/publications/reports/esener1\\_osh\\_management](https://osha.europa.eu/en/publications/reports/esener1_osh_management) [accessed 23 May 2017].

Eurostat, 2007. *European Union Labour Force Survey*. Luxembourg: Author.

Eurostat, 2010. *Health and safety at work in Europe (1999–2007): a statistical portrait*.

Luxembourg: Author.

Faul, F., Erdfelder, E., Buchner, A., and Lang, A.-G., 2009. Statistical power analyses using

G\*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*,

41(4), 1149–1160.

Frone, M.R. 2003. Work-family Balance. In J.C., Quick and L.E., Tetrick (eds). *Handbook of Occupational Health Psychology* (143-162). Washington, D.C: American Psychological Association.

Gagne, M., 2003. The role of autonomy support and autonomy orientation in prosocial behavior engagement. *Motivation and emotion*, 27(3), 199–223.

Gilbert, P., Bhundia, R., Mitra, R., McEwan, K., Irons, C., and Sanghera, J., 2007. Cultural differences in shame-focused attitudes towards mental health problems in Asian and non-Asian student women. *Mental health, religion & culture*, 10(2), 127-141.

Graham, J., 2016. *What Google learned from its quest to build the perfect team*. Available from <https://www.nytimes.com/2016/02/28/magazine/what-google-learned-from-its-quest-to-build-the-perfect-team.html> [accessed 15 May 2017].

Grant-Vallone, E. and Donaldson, S., 2010. Consequences of work-family conflict on employee well-being over time. *International Journal of Work, Health & Organisations*, 15(3). 214-226.

Greenhaus, J.H. and Beutell, N., 1985. Sources of conflict between work and family roles. *Academy of Management Review*, 10(1), 76-88. doi: 10.2307/258214.

Greenhaus, J.H., Collins, K.M., and Shaw, J.D., 2003. The relation between work-family balance and quality of life. *Journal of vocational behavior*, 63(3), 510-31.

Grover, S.L. and Crooker, K.J. 1995. Who appreciates family-responsive human resource policies, *Personnel psychology*, 48(2), 271–288.

Grzywacz, J.G., and Marks, N.F. 2000. Reconceptualizing the work-family interface: An ecological perspective on the correlates of positive and negative spill-over between work and family. *Journal of Occupational Health Psychology*, 5, 111-126.

- Hassard, J. Teoh, K., Cox, T., Dewe, O., Cosmar, M., Gründler, R., Flemming, D., Cosemans, B., and van den Broek, K., 2014. *Calculating the cost of work-related stress and psychosocial risks: European risk observatory literature review*. Luxembourg: European Agency for Safety and Health at Work. doi: 10.2802/20493
- Hayes, A.F., 2017. *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York, NY: Guilford.
- Hill, E., Hawkins, A., Ferris, M., and Weitzman, M., 2001. Finding an extra day a week: The positive effect of job flexibility on work and family life balance. *Family Relations*, 50(1), pp. 49-58.
- Hindmarch, T., Hotopf, M., and Owen, G., 2013. Depression and decision-making capacity for treatment or research: A systematic review. *BMC Medical Ethics*, 14(54). doi: 10.1186/1472-6939-14-54.
- Hoaglin, D.C. and Iglewicz, B., 1987. Fine-tuning some resistant rules for outlier labeling. *Journal of the American statistical association*, 82(400), 1147–1149.
- Hoel, H., Sparks, K., and Cooper, C.L., 2001. *The cost of violence/stress at work and the benefits of a violence/stress-free working environment*. Available from [http://www.ilo.org/safework/info/publications/WCMS\\_118190/lang--en/index.htm](http://www.ilo.org/safework/info/publications/WCMS_118190/lang--en/index.htm) [accessed 15 May 2017].
- Hosking, A. and Western, M. (2008) The effects of non- standard employment on work-family conflict. *Journal of Sociology*, 44, 5–27.
- Illies, R., Wilson, K.S., and Wagner, D.T. 2009. The spill-over of daily job satisfaction onto employees' family lives: The facilitating roles of work and family integration. *Academy of Management Journal*, 52(1), 87-102.
- Jamal, M., 2004. Burnout, stress and health of employees on non-standard work schedules: a study of Canadian workers. *Stress and Health*, 20, 113–19.

Kelly, E.L., Kossek, E.E., Hammer, L.B., Durham, M., Bray, J., Charmack, K., Murphy, L.A. and Kaskubar, D. 2008. Getting there from here: Research on the effects of work-family initiatives on work-family conflict and business outcomes. *Academy of Management Annals*, 2, 305-349. doi: 10.1080/19416520802211610.

Kieffer, C., 2013. *What recognition for work-related mental disorders: a study of 10 European countries*. Available from <http://www.eurogip.fr/en/publications-d-eurogip/3483-what-recognition-of-work-related-mental-disorders-a-study-on-10-countries> [accessed 15 May 2017].

Kikuzawa, S., 2006. Multiple roles and mental health in cross-cultural perspective: The elderly in the United States and Japan. *Journal of health and social behavior*, 47(1), 62-76. doi: 10.1177/002214650604700105.

Kotera, Y., Adhikari, P., and Van Gordon, W., 2018a. Motivation type and mental health of UK hospitality workers. *International journal of mental health and addiction*. doi: 10.1007/s11469-018-9874-z.

Kotera, Y., Green, P., and Sheffield, D., 2018b. Mental health attitudes, self-criticism, compassion, and role identity among UK social work students. *British journal of social work*. doi: 10.1093/bjsw/bcy072

Latkin, C.A., Edwards, C., Davey-Rothwell, M.A. and Tobin, K.E., 2017. The relationship between social desirability bias and self-reports of health, substance use, and social network factors among urban substance users in Baltimore, Maryland. *Addictive behaviors*, 73, 133-136.

Lewis, S., Gambles, R., and Rapoport, R., 2007. The constraints of a 'work-life balance' approach: an international perspective. *The international journal of human resource management*, 18(3), 360-373.

- Lingard, H., Brown, K., Bradley, L., Bailey, C., and Townsend, K., 2007. Improving employees' work-life balance in the construction industry: Project alliance case study. *Journal of Construction Engineering and Management*, 133(10), 807-815.
- Lingard, H. and Francis, V., 2002. *Work-life issues in the Australian construction industry: The results of a pilot study*. Report prepared for and submitted to the Construction Industry Institute of Australia.
- Lingard, H., and Francis, V., 2005. Does work-family conflict mediate the relationship between job schedule demands and burnout in male construction professionals and managers? *Construction Management and Economics*, 23(7), 733-745.
- Lingard, H. and Francis, V., 2006. Does a supportive work environment moderate the relationship between work-family conflict and burnout among construction professionals? *Construction Management and Economics*, 24, 185-196.
- Lingard, H., Francis, V., and Turner, M., 2010. Work-family enrichment in the Australian construction industry: implications for job design. *Construction Management & Economics*, 28(5), 467-480,
- Lovibond, S.H. and Lovibond, P.F., 1995. *Manual for the Depression Anxiety Stress Scales*. (2nd. ed.). Sydney: Psychology Foundation.
- Manfredi, L.D.S., 2006. Action research to develop work-life balance in a UK university. *Women in management review*, 21(3), 241-259.
- Marks, S.R., 1977. Multiple roles and role strain: some notes on human energy, time and commitment. *American Sociological Review*, 42(6), 921-936. doi: 10.2307/2094577.
- Matos, K. and Galinsky, E., 2014. 2014 National Study of Employers. Available from <http://familiesandwork.org/downloads/2014NationalStudyOfEmployers.pdf> [accessed 15 May 2017].

- van der Meer, L., Leijten, F., van der Heuvel, S.G., Ybema, J.F., de Wind, A., Burdorf, A., and Geuskens, G.A., 2016. Company policies on working hours and night work in relation to older workers' work ability and work engagement: Results from a Dutch longitudinal study with 2 year follow-up. *Journal of Occupational Rehabilitation*, 26(2), 173–181.
- Mendis, M.D.V.S. and Weerakkody, W.A.S., 2014. Relationship between work life balance and employee performance: with reference to telecommunication industry of Sri Lanka. *Kelaniya journal of human resource management*, 9(1-2), 95-117.
- Mental Health Foundation., 2016. *Added value: Mental health as a workplace asset*. Surrey: Unum.
- Messerli, F., 2012. Chocolate consumption, cognitive function, and Nobel Laureates. *New England Journal of Medicine*, 367, 1562-1564. doi: 10.1056/NEJMon1211064
- Naithani, D.P., 2010. Overview of work-life balance discourse and its relevance in current economic scenario. *Asian social science*, 6(6), 148-155.
- Milner, A., Law, P.C.F., Mann, C., Cooper, T., Witt, K. and LaMontagne, A.D. 2018. A smart-phone intervention to address mental health stigma in the construction industry: A two-arm randomised controlled trial. *SSM Population Health*, 4, 164-168.
- Milner, A., Maheen, H., Currier, D., and LaMontagne, A.D. 2017. Male suicide among construction workers in Australia: A qualitative analysis of the major stressors precipitating death. *BMC Public Health*, 17, 584.
- Nizam, I. and Kam, C., 2018. The determinants of work-life balance in the event industry of Malaysia. *International journal of management, accounting and economics*, 5(3), 141-168.
- Office for National Statistics, 2015. *Notes and definitions for the construction industry*. Newport: Author.
- Office for National Statistics, 2017a. *Sickness absence in the labour market: 2016*. Newport: Author.

- Office for National Statistics, 2017b. *Suicide by occupation, England: 2011 to 2015*. Newport: Author.
- Office for National Statistics., 2018. *Construction statistics*. Available from <https://www.ons.gov.uk/businessindustryandtrade/constructionindustry/articles/constructionstatistics/number192018edition>
- Oshio, T., Inoue, A., and Tsutsumi, A., 2017. Examining the mediating effect of work-to-family conflict on the associations between job stressors and employee psychological distress: a prospective cohort study. *BMJ Open*, 7(8), e015608.
- Oswald, D., Sherratt, F., Smith, S., and Hallowell, M., 2017. Exploring safety management challenges for multi-national construction workforces: a UK case study. *Construction management and economics*, 36(5), 291-301.
- Pradhan, G., 2016. *Conceptualising work-life balance*. Bangalore: The Institute for Social and Economic Change.
- Presser, H.B. (2000) Nonstandard work schedules and marital instability. *Journal of Marriage and the Family*, 62, 93–110.
- Rice, R.W., Freno, M.R., and McFarlin, D.B., 1992. Work-nonwork conflict and the perceived quality of life. *Journal of Organizational Behavior*, 13, 155-168.
- Rowlinson, S. and Root, D., 1996. *The impact of culture on project management, Final Report to British Council, Hong Kong*. Department of Real Estate and Construction: Hong Kong.
- Ruderman, M.N., Ohlott, P.J., Panzer, K. and King, S.N. 2002. Benefits of multiple roles for managerial women. *Academy of Management Journal*, 45, 369-389
- Ryan, R.M. and Deci, E.L., 2000. Self-determinism theory and the facilitation of intrinsic motivation, social development, and well-being. *American psychology*, 55(1), 68–78.

- Sanderson, R., 2017. *Mental health focus: what is the construction industry helpline?*  
Retrieved from <https://www.shponline.co.uk/what-is-the-construction-industry-helpline-bill-hill-explains/> [accessed 23 May 2017].
- Sarker, S., Xiao, X., Sarker, S., and Ahuja, M., 2012. Managing employees' use of mobile technologies to minimize work-life balance impacts. *MIS quarterly Executive*, 11(4), 143-157.
- Shen, Y., Koh, T., Rowlinson, S. and Bridge, A., 2015. Empirical investigation of factors contributing to the psychological safety climate on construction sites. *Journal of Construction Engineering and Management*, 141(11).
- Sone, T., et al., 2008. Sense of life worth living (ikigai) and mortality in Japan: Ohsaki study. *Psychosomatic medicine*, 70(6), 709-715.
- Simon, R.W. (1997). The meanings individuals attach to role identities and their implications for mental health. *Journal of Health and Social Behavior*, 38, 256–274.
- Statista., 2018. *Construction industry in the UK: statistics & facts*. Available from <https://www.statista.com/topics/3797/construction-industry-in-the-uk/> [accessed 15 May 2017].
- Stevenson, P. and Farmer, P., 2017. Thriving at work: the Stevenson/Farmer review of mental health and employers. Available from [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/658145/thriving-at-work-stevenson-farmer-review.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/658145/thriving-at-work-stevenson-farmer-review.pdf) [accessed 15 May 2017].
- Strazdins, L., Clements, M.S., Korda, R.J., Broom, D.H. and D'Souza, R.M., 2006. Unsociable work? Nonstandard work schedules, family relationships and children's well-being. *Journal of Marriage and the Family*, 68, 394–410.
- Thoits, P.A., 1991. On merging identity theory and stress research. *Social Psychology Quarterly*, 54, 101-112.

- Townsend, K., Lingard, H., Bradley, L., and Brown, K., 2012. Complicated working time arrangements: Construction industry case study. *Journal of Construction Engineering and Management*, 138(3), 443-448.
- Tremblay, M.A., Blanchard, C.M., Taylor, S., Pelletier, L.G., and Villeneuve, M., 2009. Work extrinsic and intrinsic motivation scale: its value for organizational psychology research. *Canadian journal of behavioural science*, 41, 213–226.
- Tukey, J.W., 1962. The future of data analysis. *Annals of mathematical statistics*, 33(1), 1–67.
- Turner, M. and Lingard, H. 2016. Work–life fit: Identification of demand and resource typologies within a systems framework. *Construction Management and Economics*, 34(6), 377–392.
- Turner, M., Lingard, H., and Francis, V., 2009. Work-life balance: an exploratory study of supports and barriers in a construction project. *International journal of managing projects in business*, 2(1), 94-111. doi: 10.1108/17538370910930536.
- Ulker, A. 2006. Do non-standard working hours cause negative health effects? Some evidence from panel data. *Centre for Economic Policy Research Discussion Paper*. Canberra: Australian National University.
- Vaganay, A., Canónico, E., and Courtin, E., 2016. *Challenges of work-life balance faced by working families*. Brussels: European Commission.
- Wanless, S.B., 2016. The role of psychological safety in human development. *Research in Human Development*, 13(1), 6-14. doi: 10.1080/15427609.2016.1141283
- Wayne, J., Casper, W., Matthews, R. and Allen, T., 2013. Family-supportive organization perceptions and organizational commitment: the mediating role of work-family conflict and enrichment and partner attitudes, *Journal of applied psychology*, 98(4). doi: 10.1037/a0032491

- Whitehouse, E., 2018. One in four say: work is hurting mental health. *People management*, May, 8-9.
- Wildes, V.J., 2005. Stigma in food service work: how it affects restaurant servers' intention to stay in the business or recommend a job to another. *Tourism and hospitality research*, 5(3), 213–233.
- Wilhelm, B.J., Heine, C., Widmann, A., Durst, W., Lüdtke, H. and Otto, G. 2010. How sleepy are construction workers during extended shifts? An objective investigation of spontaneous pupillary oscillations in tunnel workmen. *Somnologie - Schlafforschung und Schlafmedizin*, 14(3), 200-206. doi: 10.1007/s11818-010-0480-y
- White, L. and Keith, B., 1990. The effect of shift work on the quality and stability of marital relations. *Journal of Marriage and the Family*, 52, 453–62.
- Whiteoak, J. and Mohamed, S. 2016. Employee engagement, boredom and frontline construction workers feeling safe in their workplace. *Accident Analysis & Prevention*, 93, 291-298. doi: 10.1016/j.aap.2015.11.001
- Worrall, L. and Cooper, C.L., 2015. Working patterns and working hours: Their impact on UK managers. *Leadership & Organization Development Journal*, 20(1), 6-10. doi: 10.1108/01437739910251125
- Yang, J.W., Suh, C., Lee, C.K., and Son, B.C., 2018. The work–life balance and psychosocial well-being of South Korean workers. *Annals of Occupational and Environmental Medicine*, 30(38), doi: 10.1186/s40557-018-0250-z
- Yip, B. Rowlinson, S., and Siu, O.L. 2008. Coping strategies as moderators in the relationship between role overload and burnout. *Construction Management and Economics*, 26, 869–880. doi: 10.1080/01446190802213529
- Zak, P., 2011. *Trust, morality - and oxytocin?* [Video file]. Available from [https://www.ted.com/talks/paul\\_zak\\_trust\\_morality\\_and\\_oxytocin](https://www.ted.com/talks/paul_zak_trust_morality_and_oxytocin) [accessed 15 June 2017].

Zheng, C., Molineux, J., Mirshekary, S., and Scarparo, S., 2015. Developing individual and organisational work-life balance strategies to improve employee health and wellbeing.

*Employee relations*, 37(3), 354-379.

*Table 1. Descriptive Statistics: work-life balance (WLBC7), mental health problems (DASS21), and mental health attitudes (ATMHP) measures in UK construction workers (n=144)*

Scales	Measured Constructs	Variables (range)	M	SD	Skewness	Kurtosis	$\alpha$
Work-Life Balance Checklist 7	Work-Life-Balance	WLB (7-35)	20.94	6.78	-.07	-.93	.81
Depression, Anxiety, and Stress Scale 21	Mental Health Problems	Dprn (0-42)	9.26	9.16	1.52	2.38	.93
		Anx (0-42)	6.71	6.81	1.50	1.67	.88
		Strs (0-42)	13.11	8.45	1.20	1.41	.89
Attitudes Towards Mental Health Problems	Mental Health Attitudes	CA (0-12)	3.85	2.95	.85	.48	.88
		FA (0-12)	1.67	2.18	1.68	3.41	.85
		CES (0-15)	5.28	4.11	.42	-.53	.97
		FES (0-15)	1.30	2.28	1.47	.63	.97
		IS (0-15)	6.72	4.21	.38	-.59	.94
		FRS (0-21)	5.19	4.50	.99	.60	.88
		SRS (0-15)	2.57	3.64	1.53	1.83	.95

WLB=Work-Life Balance; Dprn=Depression; Anx=Anxiety; Strs=Stress; CA=Community Attitudes; FA=Family Attitudes; CES=Community External Shame; FES=Family External Shame; IS=Internal Shame; FRS=Family-Reflected Shame; SRS=Self-Reflected Shame

Table 2. Correlations among work-life balance, mental health problems, and mental health attitudes in UK construction workers (n=144)

	1	2	3	4	5	6	7	8	9
1 GN	-								
2 Age	.07	-							
3 WWH	.34**	-.04	-						
4 WLB	-.10	.00	-.32**	-					
5 MHP	-.10	-.08	.00	-.27**	-				
6 NA	.05	-.09	.31**	-.26**	.18*	-			
7 ES	.03	-.03	.24**	-.13	.20*	.77**	-		
8 IS	-.05	.09	.12	-.10	.27**	.41**	.47**	-	
9 RS	.06	.04	.03	.04	.28**	.44**	.56**	.54**	-

GN=Gender (0=female, 1=male); WWH=Average Weekly Working Hours; WLB=Work-Life Balance; NA=Negative Attitudes Towards Mental Health Problems; ES=External Shame; IS=Internal Shame; RS=Reflected Shame; MHP=Mental Health Problems.  $p<.05^*$ ;  $p<.01^{**}$

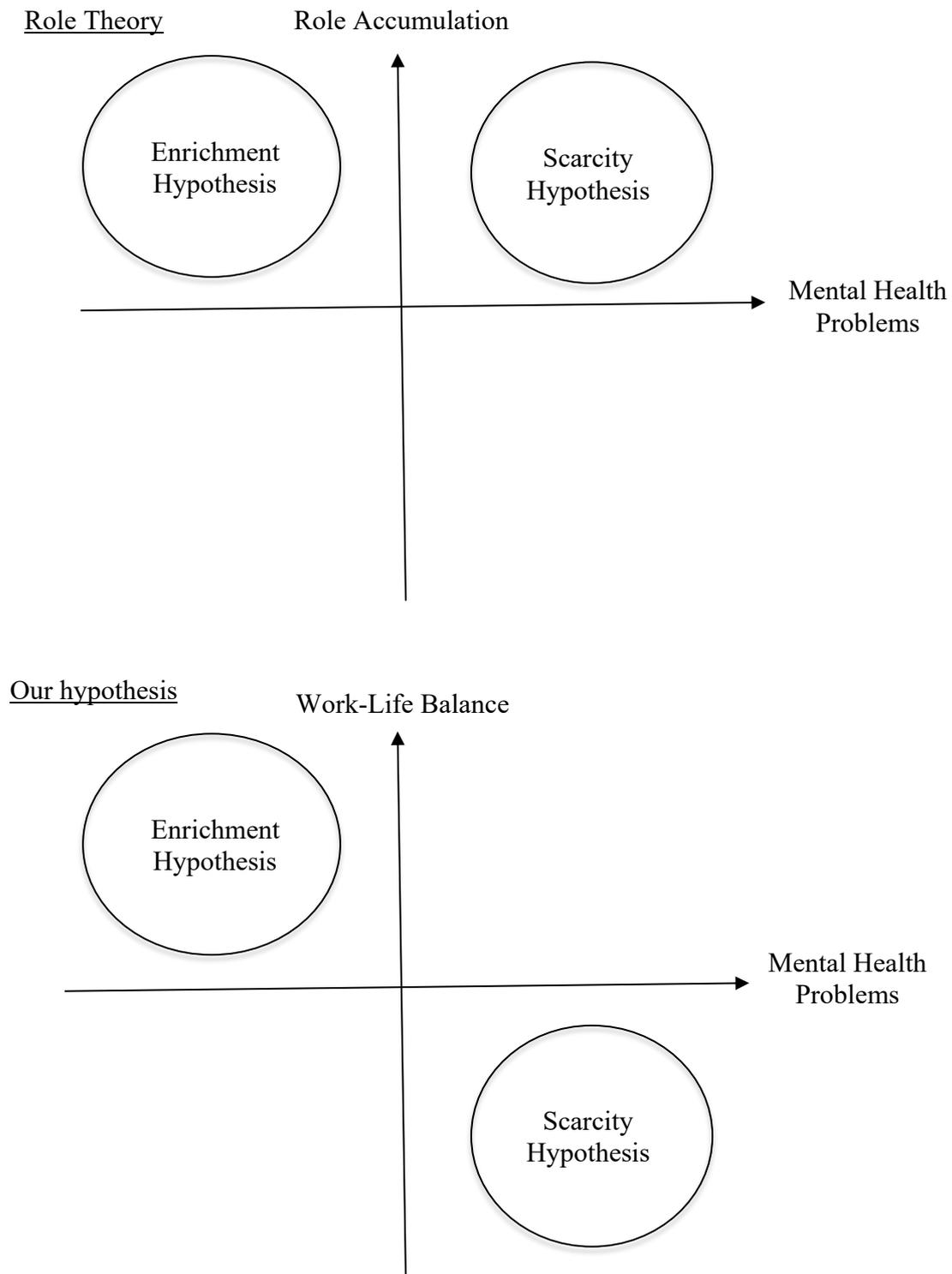
*Table 3. One-way MANOVA: Difference in the mean work-life balance, mental health problems, and mental health attitudes scores between different work patterns.*

Work patterns	WLB	MHP*	MHA
	M±SD	M±SD	M±SD
Day time only (n=38)	4.58±.74	5.70±1.88 <sup>ab</sup>	4.63±1.50
Routinely day times with some night shifts (n=52)	4.52±.79	4.55±1.71 <sup>a</sup>	4.83±1.72
Mixture of day and night working (n=26)	4.47±.86	4.23±1.44 <sup>b</sup>	4.84±1.91
Routinely night shifts with some day time working (n=13)	4.62±.81	5.80±1.88	5.01±2.03
Night shifts only (n=13)	4.29±.64	5.81±3.01	5.42±2.33

\*Significant differences among the groups ( $p < .01$ ). Similar superscripts indicate a significant difference between the two groups on that measure ( $p < .05$ ).

WLB=Work-Life Balance; MHP=Mental Health Problems; MHA=Mental Health Attitudes.

Figure 1. Comparing Role Theory and our hypothesis.



*Figure 2: Mental health attitudes as a mediator in the relationship between work-life balance and mental health problems.*

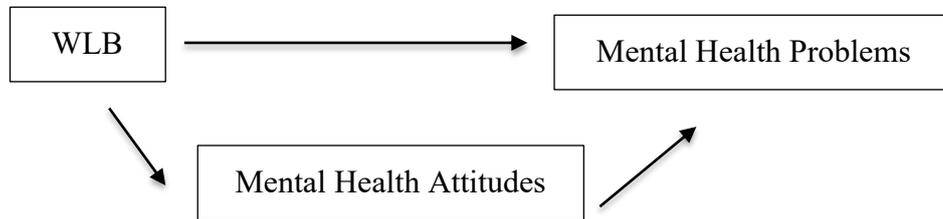


Figure 3: Mapping out Aim 1 onto the scatter plot for the relationship between work-life balance and mental health problems.

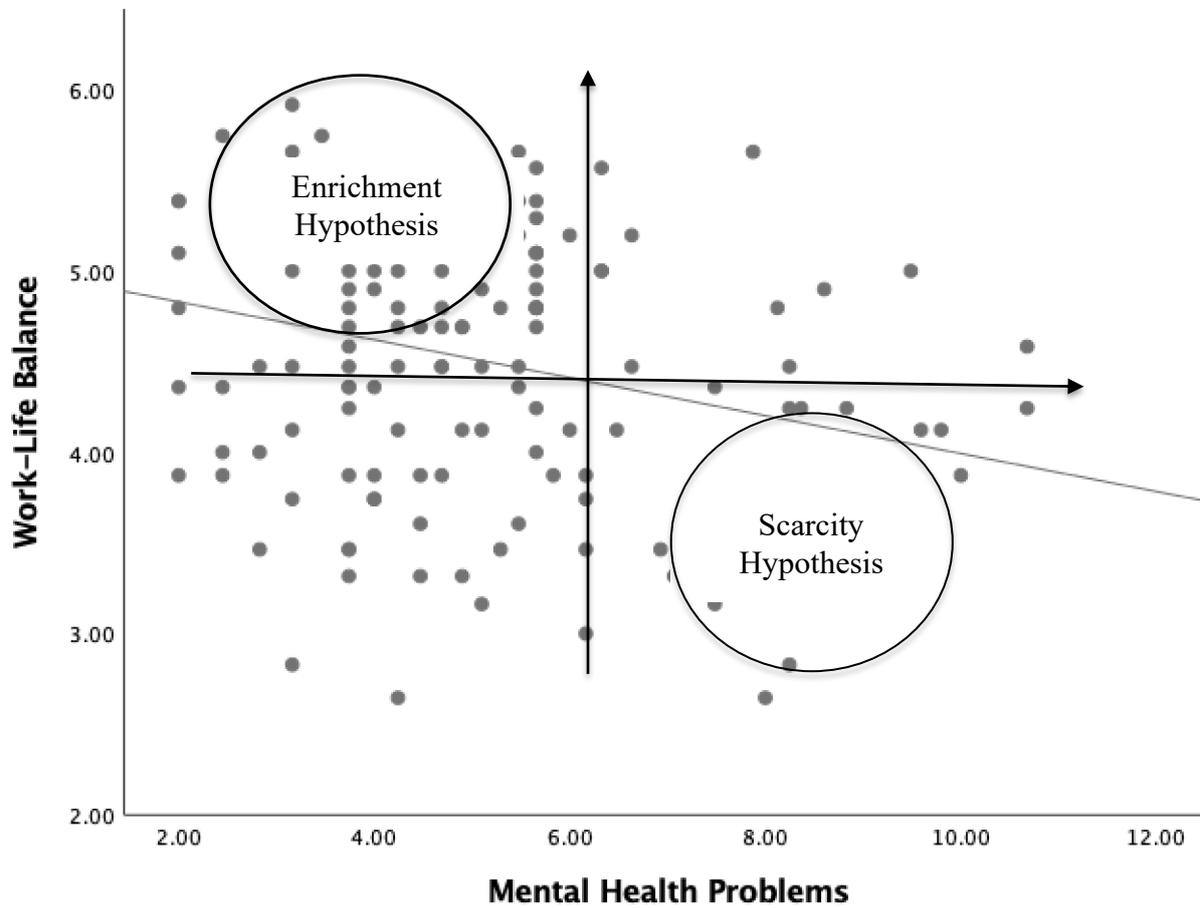
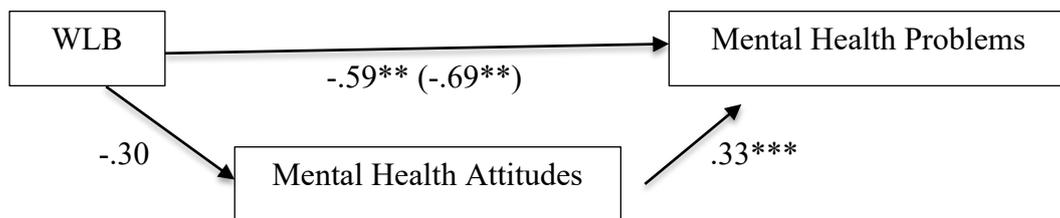


Figure 4. Parallel mediation model: Work-life balance as a predictor of mental health problems, mediated by mental health attitudes. The confidence interval for the indirect effect is a BCa bootstrapped CI based on 5,000 samples.



\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ . Direct effects (Total effects)