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Work-Family Conflict and Dangerous Driving Behaviours: The Mediating Role of Affect

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All authors have no conflict of interest to declare.

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The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Abstract

This paper examined the under-studied relationship between work–family conflict and dangerous driving behaviours in a sample of employees, and job-related affect as a mediator of this relationship. The sample consisted of 476 Malaysian drivers (44.7% male; 55.3% female) aged 19 to 60 years. The participants completed scales measuring bidirectional work family conflict (work interference with family, WIF; family interference with work, FIW), job-related negative affect, dangerous driving behaviours, and socio-demographics. The data were analysed using structural equation modelling (SEM). Our findings indicate that dangerous driving was predicted by FIW, but not WIF. As predicted, job-related negative affect fully mediated the relationship between WIF and dangerous driving. Furthermore, the effect of FIW on dangerous driving behaviours was partially due to negative affect at work. Mediation path was conditional upon gender, suggesting the indirect effects of the relationship between FIW and dangerous driving behaviours via job affect occurs in males but not females. The findings of this study may be useful as a starting point for both applied and theoretical investigations of the role of the psychological effects of juggling work and family responsibilities and affect in traffic safety.

1 INTRODUCTION

Road traffic injuries are currently estimated to be the 8th leading cause of death across all age groups globally, with over 1.35 million people dying each year, and the magnitude of the problem is forecast to increase (World Health Organization, 2018). In particular, driver engagement in dangerous driving behaviour is a leading cause of preventable road traffic incidents, and is recognized to increase the likelihood of accidents and crashes leading to both injuries and material damage for both the driver and other road users (Hayley, de Ridder, Stough, Ford, & Downey, 2017). Dangerous driving encompasses aggressive driving

with intentional acts of physical, verbal, or gestured aggression, experiencing negative cognitive/emotions such as anger while driving, and performing risk-taking behaviours (Dula & Ballard, 2003). Based on this knowledge, in recent years psychologists have focused increasingly on driving behaviour and traffic safety, particularly on how psychological factors such as personality and emotional states influence dangerous driving and accident involvement.

Psychological stress that is extraneous to the driving situation, for example, is one important factor that has been suggested to be related to dangerous driving and the increased risk of road traffic accidents (Ge et al., 2014; Havarneanu, Măirean, & Popuşoi, 2019; Mann et al., 2010). Research has shown an association between various types of stressors and unsafe driving, as evidenced by associations between various indices of stress and crash involvement (Havarneanu et al., 2019; McLinton & Dollard, 2010; Rowden et al., 2011). Ge et al. (2014), for instance, found that the general perception of stress derived from ongoing life circumstances and expectations concerning future events was significantly correlated with dangerous driving behaviour. Using work-related stress and daily hassles as stressors extraneous to the driving environment, Rowden et al. (2011) found evidence to suggest that in individuals who drive less regularly for work purposes (or even those who only drive for personal reasons), stress that originates from any source within their workplace and family has the potential to spill over and influence the driving task. In a classic study, McMurray (1970) examined the driving performance of persons involved in divorce proceedings, finding that these participants had significantly higher accident involvement and violation rates than the general driving population, suggesting that emotional distress and personal turmoil may lead to negative driving outcomes.

Given the changes in socio-demographic diversity in the workplace, increased work demands, and dual career families over the past few decades, recent evidence suggests that

stress originating from work-family conflict may be more prevalent than previously recognized across the globe (Allen, French, Dumani, & Shockley, 2015). Work-family conflict has been broadly conceptualized as employees' struggle to integrate the conflicting demands of work and family roles (Voydanoff, 2002). Researchers (Allen & Armstrong, 2006; Grandey, Cordeiro, & Crouter, 2005) have recognized work-family conflict as bidirectional, that is, work can interfere with family (work interference with family; WIF) and family can interfere with work (family interference with work; FIW). The impact of both forms of work-family conflict has been found in different fields, including health-related outcomes and health behaviours (Amstad, Meier, Fasel, Elfering, & Semmer, 2011; Davis, Gere, & Sliwinski, 2017; Gisler et al., 2018; Shukri, Jones, & Conner, 2018), and continues to be a topic of considerable interest to researchers. However, to our knowledge, no previous study has examined the relationship between work-family conflict and employee driving outcomes. Drawing on the health psychology literature, it makes sense that traffic safety, including dangerous driving, be considered a health risk behaviour that might be responsive to the important life stressor of work-family conflict. The present study, first, attempts to examine the contributions of work-family conflict to dangerous driving among Malaysian drivers. Second, this study tests whether job-related affect in the relation between WIF and FIW and dangerous driving behaviours, and whether gender moderates these associations.

Consistent with global trends, some researchers have reported stressful lifestyles, including work-family conflict, as increasing social issues that relate to health and well-being in Malaysia (Hassan, Dollard, & Winefield, 2010). As a developing country, many work organizations in Malaysia still either lack work and family friendly policies or are at an early stage of adoption of such policies, despite the fact that Malaysian employees typically face more work demands and longer working hours than reported in the West, leading to escalated

level of work-life balance issues (Hassan et al., 2010; Le, Newman, Menzies, Zheng & Fermelis, 2020). Additionally, like other Asian cultures, strong traditional gender role orientation has also become a barrier to achieving work-life balance (Noor & Mahudin, 2015). Concurrently, road injuries and fatalities are a growing concern in Malaysia. According to annual accident reports (Royal Malaysia Police, 2017), there has been a steady increase in reported traffic accidents within the last decade, rising from 341,252 cases in 2006 to 521,466 in 2016; killing more than 6,000 people per year by 2016. A study by Sullman, Stephens, and Yong (2015) examined anger, aggression, and road rage behaviour and found positive associations between aggressive forms of anger expression and crashes as well as associations between aggressive tendencies and recent road rage behaviour among Malaysian drivers. Could these two phenomena be related? In other words, could stress that originates from work-family conflict be considered an important determinant of detrimental road safety outcomes? This is an important avenue of research in the work-family literature because understanding the relative contributions of heightened stress resulting from the competing demands of the work and family domains on driving outcomes is needed to help road safety initiatives in Malaysia as well as improve our understanding of road accident causation.

1.1 Literature Reviews

1.1.1 Work-Family Conflict and Driving Behaviours

For some time, as stated above, in addition to studies of driving, scholars have determined that work-family conflict may undermine other healthy behaviours (Allen & Armstrong, 2006). A few studies have also tied work-family conflict to safety outcomes, supporting the finding that higher levels of work-family stress lead to decreased safety behaviours in work settings (Cullen & Hammer, 2007; Wei, Guo, Ye, Liao, & Yang, 2016). Studies that independently examined both forms of work-family conflict have found different and inconsistent correlation patterns in the relationship between WIF, FIW, and behavioural

outcomes (Amstad et al., 2011). Hence, our study tested the predictive power of these two types of work-family conflict.

Research within the work-family field (Greenhaus & Bautell, 1985, Grandey & Cropanzano, 1999; Rotondo, Carlson, & Kincaid, 2003) has directly or indirectly focused on the lack of sufficient resources of time and energy and psychological strain as the central premises to explain the link between work-family conflict and behavioural outcomes. Applied to the driving behaviour realm, there is a growing body of evidence that commuting acts as a stressor by interfering with living and working by reducing available time (Costa, Pickup, & Di, 1988). Thus, based on the idea that time is a fixed resource for both forms of conflict (Greenhaus & Beutell, 1985), the issue of time pressure and preoccupation with one role rather than another may be especially relevant for this body of research on driving. For instance, events related to WIF (e.g., long working hours, irregular working) and FIW (e.g., childcare and education, household responsibilities) may interfere with drivers' schedules. Under such circumstances, unsafe driving, such as speeding and risk-taking behaviour, might occur due to perceived time pressure and urgency (Adams-Guppy & Guppy, 1995). Second, the competing demands of work-family conflict could also create psychological strain outcomes because they threaten the valued resources of time and energy. It has been proposed that such strains exert a negative influence on work-life balance through mechanisms of negative emotions such as tension, energy depletion, fatigue, and irritability (Greenhaus & Beutell, 1985). It should be noted that, while conceptually distinct, it is likely that time- and strain-based demands have several common sources (Greenhaus & Beutell, 1985). Applied to the traffic situation, stressors such as time pressures and strain from both WIF and FIW may directly lead to negative driving outcomes, as they may spill over into other areas of one's life and influence driving behaviour. Based on the above, we hypothesize the following:

H_1 WIF is positively related to dangerous driving behaviours.

H_2 FIW is positively related to dangerous driving behaviours.

1.1.2 The Role of Job-Related Affect

Affect generally refers to any subjective state representing how an object or situation impacts a person (Duncan & Barrett, 2007), and encapsulates different moods and emotions (Balducci, Schaufeli, & Fraccaroli, 2011). In this study, we focus specifically on job-related negative affect because a large proportion of an employees' work day is spent at work, which in turn increases exposure to cumulative affective experiences in the work environment. The influence of affective state on an individual's experiences (i.e., stressful events) and behaviours, has often been explained by affective events theory (Weiss & Cropanzano, 1996). Consistent with the transactional theory of stress (Lazarus, 1995), affective events theory provides a theoretical rationale suggesting psychological stress including work-family conflict involves: a cognitive appraisal (i.e., one evaluates whether a specific event could be positive or negative according to one's personal goal) and an affective reaction as the outcome of the cognitive appraisal (Hunter, Clark, & Carlson, 2019). Conceptually, it is assumed that positive events will result in a positive affective state while negative events will elicit negative affect (Carlson, Kacmar, Zivnuska, Ferguson, & Whitten, 2011). For example, an event related to WIF (e.g., demand to work overtime), if perceived as unfavourable because it is likely to obstruct family goals, will elicit negative affective arousal such as anxiety, guilt, or anger. Empirical research has supported the basic tenets of affective events theory, as researchers have found that the experience of work-family conflict causes negative affect (Livingston & Judge, 2008; Speights, Bochantin & Cowan, 2019). A qualitative study (Speights et al., 2019) showed that most emotions experienced during work-family conflict are negative. A study of 41 employed parents (Williams & Alliger, 1994) examined how multiple role juggling affected both negative and positive mood in work and family roles.

Findings highlight the fact that negative moods spilled over from work to family and vice versa, but positive moods had little spillover. Hence, we propose the following hypotheses:

H_3 WIF is positively related to job-related negative affect.

H_4 FIW is positively related to job-related negative affect.

Studies have documented a substantial body of evidence that emotional and affective components induce a motivational tendency to perform a set of (negative) driving behaviours (Roidl, Frehse, & Höger, 2014). The role of affect has attracted the attention of researchers in numerous traffic studies (Havarneanu et al., 2019; Hu, Xie, & Li, 2013; Jeon, Walker, & Yim, 2014; Mesken, Hagenzieker, Rothengatter, & de Waard, 2007; Roidl et al., 2014; Trógolo, Melchior, & Medrano, 2014), with the view that understanding the effect of affective states on driving is crucial to improving traffic safety interventions (Jeon et al., 2014). This is supported by a substantial body of research describing the role of emotion on driving-related tasks and performance by influencing cognition and information processing, including attention (Pêcher, Lemercier, & Cellier, 2009), driving subjective judgment, risk perception, (Jeon et al., 2014), and driving attitude (Hu et al., 2013).

Studies indicating the relevance of affect to driving have mainly focused on the negative emotional state of anger (Mesken et al., 2007). Anger was found to be related to unsafe driving, including speeding (Roidl et al., 2014), commission of traffic violations and errors (Jeon et al., 2014) and aggressive driving (Lajunen & Parker, 2001). Research in this area has also found that other specific negative emotions such as depression, sadness, anxiety and nervousness are associated with risky and dangerous driving (Bulmash et al., 2006; Jeon, 2016; Roidl et al., 2014; Scott-Parker, Watson, King, & Hyde, 2013). Hu et al. (2013) found that more negative mood resulted in higher risk perception, laxer attitudes towards risky driving, and higher self-reported risky driving. Hence, we propose the following hypothesis:

H_5 Job-related negative affect is positively related to dangerous driving behaviours.

1.1.3 Proposed Mediated Model

In general, the mediating role of negative affect in the relationship between work-family conflict and various behavioural outcomes is well supported (Frone, Barnes, & Farrell, 1994; Judge, Ilies, & Scott, 2006; Kafetsios, 2007). Furthermore, because emotional reactions are assumed to function similarly in work and other domains (Livingstone & Judge, 2008), both directions of conflict are assumed to be significantly related to negative emotion in the literature. Consequently, knowledge of whether WIF versus FIW produces distinct affective reactions is less understood and studied. The study of Frone et al. (1994), for example, was among the first to consider both directions separately within the substance abuse domain. They found concurrent correlations of WIF and FIW with negative affect (e.g., psychological distress), indicating that WIF and FIW and outcomes are related. Also, Judge et al. (2006) investigated the effect of WIF and FIW on negative feelings (e.g., guilt and hostility), and the implications for both job and marital satisfaction. This showed that WIF at home was associated negative affect at home, while FIW at work was associated with negative emotions at work. Recent findings of Speights et al. (2019), however, challenge earlier studies, highlighting the differentiated emotional experiences of work-family conflict depending on whether conflict originates from work or family. In sum, existing studies on directional effects of work-family conflict find differences based on affect measures and behavioural outcomes examined.

Thus, in addition to the direct relationship detailed above, we propose that job-related affect has a mediating effect underlying this relationship between FIW/WIF and driving behaviours. The mediation model is shown in Figure 1. We construct the hypotheses based on the assumption that the primary link between WIF and FIW and affective experiences lies within the domain where the conflict originates (Amstad et al., 2011; Judge et al., 2006; Kafetsios, 2007) to explain the mediation effect pathways. Specifically, we expect WIF may

induce stronger work related negative affect than FIW because it represents a similar domain, as conflict originating in one domain will predominantly be correlated within similar domains (Amstad et al., 2011). Hence, the effect of WIF on driving behaviours is more likely to be mediated by work related negative affect than is the FIW-driving behaviours relationship. As such, negative job affect may completely or partially mediate the relationship between WIF and dangerous driving behaviour. So, for example, events related to WIF (e.g. demands to work overtime) may engender a negative affective response in the workplace as people are forced to sacrifice time needed for fulfilling family demands. Such conditions may provoke dangerous acts on the road including tailgating and crossing double lines, particularly when people find themselves in a race against time.

As for the FIW mediation path, we could expect that this process will be at least partially mediated by job related negative affect. This is because, negative feelings related to FIW may lead to job related affect suffering, which in turn may have an influence on driver's safety on the road. This is in line with research that suggests negative spillover across work-family nexus, in that feelings, attitudes, and behaviours that develop in one domain are carried over into the other domain (Offer, 2014). In addition, employees tend to express negative emotions towards their job and organizations when experiencing both WIF and FIW (Grandey et al., 2005; Speights et al., 2019). Furthermore, people experiencing FIW (e.g., family emergencies) may lose their temper or become aggressive while driving, or engage in such behaviours as part of the expression of disappointment towards their supervisors for being inflexible and unsupportive to family demands. Because the results from prior research are not fully consistent in relation to two types of work-family conflict, we point to the following hypotheses.

H_6 Job-related negative affect mediates the relationship between WIF and dangerous driving behaviours.

H_7 Job-related negative affect mediates the relationship between FIW and dangerous driving behaviours.

Furthermore, because WIF and FIW consist of two domains that have traditionally been gender specific (McElwain, Korabik, & Rosin, 2005), gender is expected to moderate the relationship between stress vulnerability and behavioural outcomes (Bilodeau, Marchand, & Demers, 2020). Nonetheless, empirical results on whether there are gender differences in work-family conflict remains unclear and may vary across contexts (Bilodeau et al., 2020; Shockley, Shen, DeNunzio, Arvan, & Knudsen, 2017). Other research, however, suggests that spillover between work and family obligations are more pronounced among women than men (Offer, 2014). As with unsafe driving behaviour generally, male drivers tend to report more dangerous driving (Aldred, Johnson, Jackson, & Woodcocket, 2020; Iliescu, & Sârbescu, 2013) and traffic violation (Qu et al., 2015) than their female counterparts. Nonetheless, it is interesting to note that women generally report more driving difficulties, experience more stress in difficult traffic situations and have higher overall stress levels while driving (Hill, & Boyle, 2007; Taubman-Ben-Ari, Mikulincer, & Gillath, 2004). With regard to traffic violations, Simon and Corbett (1996) found that stress was positively associated with offending among both genders. To this end, it remains unclear whether gender differences in self-reported stress vulnerability are expressed in driving behaviour (Matthews, Joyner & Newman, 1999). In light of these findings, we examined moderated mediation relationships, specifically we tested whether the links from WIF and FIW to negative affect and dangerous driving behaviours vary across gender. We hypothesised that:

H_8 Gender will moderate the mediating effect of negative affect on the relationship between WIF and dangerous driving behaviours such that these relationships will be stronger for women than men.

H_9 Gender will moderate the mediating effect of negative affect on the relationship between FIW and dangerous driving behaviours such that these relationships will be stronger for women than men.

Insert Figure 1 here

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2 METHOD

2.1 Participants and Procedures

The sample consisted of 213 (44.7%) male and 263 (55.3%) female drivers. The ages ranged from 19 to 60 years, with an average of 38.1. The majority of the participants were married (77.5%), with the other 22.5% being single or divorced; while 72% of the respondents had one or more children at home and 28% had no children at home. All participants worked in professional jobs (from education, banking and engineering sectors), recruited through a convenience sampling procedure from several public (54.3%) and private (45.7%) organizations. They were all licensed drivers who drove to and from work each day with driving experience that ranged from less than one year to 40 years (Mean =18.1, SD = 7.43), with the vast majority (79%) having considerable driving experience (>10 years driving experience). The questionnaire was administered online and disseminated through email with the assistance of the administrative staff of the respective organizations. All procedures were approved by the institutional review board.

2.2 Measures

All measures were translated into Malay and back-translated into English by experts. The questionnaire consisted of two parts. The first part collected basic information pertaining to respondents' demographic background, including age, gender, number of children, marital status, total working hours per week, and time spent driving to work. Age, number of

children, and working hours were used as continuous variables. The second part contains the theoretical constructs used in this study. All constructs were originally adapted from prior research with appropriate revisions to fit the research context. Initially, exploratory factor analysis (EFA) for each measure represented by each construct was conducted from 100 respondents (Kline, 1979). The Kaiser-Meyer-Olkin (KMO) test is used to test the validity of the items (Pallant, 2013). The KMO value in this study was 0.882, which exceeds the desired level. Bartlett's test of sphericity test was also used to test the validity of the questionnaire. The *p*-value yielded by this test should be significant ($p < 0.05$) for further analysis to be justified (Pallant, 2013). In this study, the questionnaire exceeded the required level of $\chi^2 = 5842.72$ ($p < 0.01$), showing that the research items had significant reliability values. Specifically, the Cronbach's alpha values for each construct except dangerous driving exceeded the value of 0.7, as discussed below.

Work-Family Conflict

Work-family conflict was measured using scales developed by Carlson, Kacmar, and Williams (2000), to assess both forms of conflict (i.e., WIF and FIW) with time-based and strain-based subscales. Twelve items were used, with each subscale measured by three items scored on a 5-point Likert-type scale ranging from 1 = *strongly disagree* to 5 = *strongly agree*, where higher scores indicate greater conflict. Internal consistencies for all work–family conflict subscales were good: 0.91 for WIF and 0.88 for FIW.

Job-Related Negative Affect

Eight items were used, derived from the multi-affect indicator (Warr, Bindl, Parker, & Inceoglu, 2014) to measure job-related negative affect. The participants rated the extent to which their jobs had made them experience any of several feelings (nervous, depressed, anxious, dejected, tense, despondent, worried, and hopeless) over the past few weeks. These

items were scored on a 4-point scale ranging from 1 = *never* to 5 = *always*, with higher scores indicating a higher level of negative affect. Cronbach's α for this study was 0.92.

Dangerous Driving

Dangerous driving was measured using a research instrument measuring three distinct constructs: aggressive driving, risky driving, and negative/emotional driving (Dula & Ballard, 2003). The original measure (Dula & Ballard, 2003) consisted of 28 items with three conceptually distinct subscales: aggressive driving, negative cognitive emotion driving, and risky driving. The items were rated on a 5-point scale ranging from 1 = *never* to 5 = *always*. Following pilot testing, two items of the risky driving subscale related to intoxicated driving were omitted because of the limited number of people who drink alcohol in the studied population. Based on the EFA results discussed above, six items were removed due to loading factors less than 0.45. The internal consistency of aggressive driving and negative/emotional driving in the current sample was good (α = 0.88 and 0.87, respectively), but was not for the construct of risky driving (α = 0.44). It was decided that the latter construct would be dropped from further analysis. Hence, the Malay version of the dangerous driving measure with 14 items was used for analysis (see Table 1).

2.3 Data Analysis

We conducted confirmatory factor analysis (CFA) to assess the goodness of fit of the measurement model and structural equation modelling (SEM) to examine the hypothesised structural model. Based on prior work-family conflict and driving research, demographic variables of gender, age, marital status and number of children were treated as control variables. All analyses used AMOS 24.0.

Measurement Model

Confirmatory factor analysis was performed to test the reliability, validity, and unidimensionality of the measurement model (Jöreskog, Sörbom, & Du Toit, 2001). The results of the CFA demonstrated the following fit indices: χ^2/df = 2.870, GFI = 0.842, CFI = 0.903, RMSEA = 0.063, and SRMR = 0.062, indicating that all of the fit indices are satisfactory and that all items are significantly related to their relevant constructs (Supplementary Figure 2).

Second, we evaluated the unidimensionality, validity, and reliability of the measurement model. In assessing these criteria, we calculated the average variance extracted (AVE) and composite reliability (CR) as reference values. As shown in Table 1, all factor loadings (λ) for all items of the constructs were above 0.60. The requirement of unidimensionality was achieved by deleting items with low factor loadings. The reliability and convergent validity were estimated by composite reliability CR and AVE. All items in the constructs are statistically significant, with AVE for each construct equal or higher than 0.5 (Fornell & Larcker, 1981). The results also provide evidence for discriminant validity, as the correlations between exogenous constructs were less than 0.85 (see Table 2). The diagonal values (in bold) are the square roots of AVE, while the other values are the correlations between the respective constructs. Discriminant validity is achieved when a diagonal value is higher than the values in its row and column. In other words, the results demonstrated adequate discriminant validity for all constructs.

Insert Table 1 here

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3 RESULTS

3.1 Descriptive Analyses and Correlations

The means, standard deviations, and zero-order correlations among the constructs are presented in Table 2. Of the work-family conflict measures, WIF was higher than FIW. There were significant gender differences in the level of FIW (t (474) = 3.07, p< 0.01) and driving (t (474) = 5.35, p< 0.001), indicating that female drivers reported higher FIW (mean = 14.09, SD = 4.71) and lower dangerous driving (mean = 28.26, SD = 8.66) than men (mean = 12.78, SD = 4.57; mean = 32.83, SD = 9.92, respectively). The inter-correlations were as expected, with WIF and FIW both significantly related to driving behaviour. In addition, negative affect was positively correlated with dangerous driving and work–family conflict subscales.

Insert Table 2 here

3.2 Structural Equation Modelling (SEM)

To evaluate the proposed model, the fit index was checked. Based on the values of χ^2/df = 2.599, GFI = 0.840, CFI = 0.902, RMSEA = 0.058 all fit indices achieved their critical values or standard level. Overall, the statistics for each fit index exceeded the critical values proposed by Bollen (1989) and Hair, Black, Babin, and Anderson (2010), suggesting that the model showed good fit for the data.

3.3 Hypothesis Testing

The results of the structural relationships are shown in Table 3. With regard to the effect of WIF, the results indicate that the direct path β_1 from WIF to driving was not significant, suggesting that WIF had no significant direct effect on driving (β = 0.061, p = .324). However, it is worth noting that the apparent link between WIF and driving shown in Table 2 is reduced to non-significance once negative affect is included in the model. Both the indirect path β_3 from WIF to negative affect (0.358, p < 0.001) and the path β_2 from negative affect

to driving (0.411, $p < 0.001$) were significant, supporting H3 and H5. This indicates that WIF was positively related to negative affect. In turn, negative affect was positively related to dangerous driving. The indirect effect, $\beta_2 \times \beta_3 = 0.411 \times 0.358 = 0.147 >$ direct effect $\beta_1 = 0.061$. The above criteria provides evidence for full mediation, indicating that negative affect fully mediates the relationship between WIF and dangerous driving confirming H6.

Next, regarding the influence of FIW on driving, the direct path β_1 from FIW to driving showed a statistically significant effect (β = 0.255, $p < .001$). Hence, H_2 was supported. The indirect path β_3 from FIW to negative affect was significant (β = 0.191, $p <$ .001), supporting H_4. The results also suggest that the indirect effect, $\beta_2 \times \beta_3 = 0.411 \times 0.191 = 0.078 <$ direct effect $\beta_1 = 0.255$, confirming the partial mediation effect. Given that the association between FIW and driving is reduced significantly when affect is adjusted for, we conclude that negative affect partially mediates the relationship between FIW and dangerous driving. Hence, Hypothesis 7 was supported. Overall, the model explained 45% of the total variance.

Insert Table 3 here

3.4 Moderated Mediation

The final stage of the analyses included the tests of moderated mediation. We followed Gaskin's (2011a) method for performing multi-group invariance test. First, we examine the change in fit of the model attributable to constraining these paths to be equal in females and males versus allowing them to different. Moderation would be indicated by significant change in χ^2 (>3.84 change for 1 df change). First, the unconstrained model was tested and resulted in $\chi^2(1204) = 2193.84$. Second, constrained model was tested which resulted in $\chi^2 (1239) = 2247.95$. Hence, the χ^2 difference test between models was significant ($\Delta \chi^2 (35) =$

54.11, $p < 0.05$), indicating support for a moderation effect on the association between the constructs in the selected path.

To analyze group differences, the z-score was obtained from output of critical ratio of differences in AMOS with the help of excel stat tool package (Gaskin, 2011b). The value of z-score were used to determine the significant effect, with any values >1.96 (p-values < 0.05) indicates the significant effect. The moderated mediation analyses reporting the estimations for male and female with the z-score are shown in Table 4. The results showed that the effect of WIF on driving via negative affect was similar in both men and women. Therefore H_8, was not supported. Only one pathway showed the evidence of moderation (FIW- negative affect) and that this path was significant in men ($\beta = 0.22$, $p < 0.001$) but not in women ($\beta = 0.03$, n.s), suggesting the effect of FIW on driving via affect was only significant in men.

Insert Table 4 here

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4 DISCUSSION

Our results revealed that FIW, but not WIF, had a direct predictive effect on dangerous driving. This is despite the fact that WIF has been reported more frequently than FIW in current research. Given the dearth of research on the relationship between work-family conflict and driving, it is still unclear why such a result emerged. However, it is possible that FIW contributes to dangerous driving for two reasons. First, viewed from a time-resource perspective, it seems plausible to assume that the perception of time scarcity (Jabs & Devine, 2006) could increase drivers' involvement in dangerous driving such as racing slow-moving vehicles, crossing double lines, and speeding, as holding multiple roles may compete for a person's time. Research has found that being a hurried driver is associated with a variety of unsafe driving behaviours, as hurried drivers also reported greater levels of frustration and

impatience with other drivers, suggesting that they have difficulty withstanding or coping with negative psychological states when driving (Beck, Daughters, & Ali, 2013). The results may be partly due to the fact that, while the performance of family roles (e.g., arranging children's school schedules) tends to be less structured and formalised, time in paid work is a fixed resource. Therefore, if family responsibility does impinge on work, it is potentially more damaging (e.g., one could lose a job due to tardiness). This is in line with the observation that work-related time pressures are positively associated with FIW (Voydanoff, 2005).

Second, in keeping with affective events theory (Weiss & Cropanzano, 1996) and building on the work of Muraven and Baumeister (2000), we speculate about the possible mechanisms for the negative influence of strain related to FIW on driving performance. As suggested by Muraven and Baumeister (2000), coping with stress (e.g., endless house chores, disruptions by children) leads to the depletion of self-regulatory resources, described as mental efforts to control negative emotions. The decline in resources for self-control under such circumstances may lead to poor self-regulation in performance, including subsequent driving tasks, thereby increasing the risk of dangerous driving. Alternatively, regulating a (negative) emotional state is another common experience that depletes coping resources and requires self-control when facing stressful conditions (Muraven & Baumeister, 2000). It has been found that difficulties in regulating emotions are associated with various maladaptive behaviours (Myruski, Denefrio, & Dennis-Tiwary, 2018), including various types of unsafe driving (Trógolo et al., 2014). This is consistent with previous studies indicating that FIW, not WIF, is a threat to other risky behaviours (Allen & Armstrong, 2006; Nelson et al., 2013; Shukri et al., 2018) through emotional reactions. Future research is needed to confirm these findings and explore the rationale for the direction of work-family conflict predicting dangerous driving.

Confirming the hypothesis, the result supported an indirect relationship between WIF and driving fully mediated by job related negative affect. Perhaps the important finding is that, by applying the affective events theory (Weiss & Cropanzano, 1996), the present study provides evidence that the WIF-driving relationship may not be explained by simple direct relationships, rather, the accumulation of negative moods in reaction to conflict may provide the key to the process of connecting WIF to dangerous driving behaviour. This provides additional support to the findings of others (Judge et al., 2006; Frone, Russell, & Cooper, 1992) in term of relationships among directions of conflict, domain-specific affect and behavioural outcomes. In the context of this study, as Judge et al. (2006) noted, perhaps the perception of WIF experienced at work shapes job related emotions because work may be both the target and the domain in which the conflict is experienced, that, in turn has negative implications for individual drivers on the road. Furthermore, our results reveal the indirect relationship between FIW and driving was partially mediated by job negative affect. This appears to reflect the relatively strong direct relationship between FIW and dangerous driving behaviours as previously discussed. Alternatively, the non-work affective mediating mechanisms may also have been at work. For example, previous studies (Judge et al., 2006; Williams, & Alliger, 1994) have found the contributing role of negative emotion spillover (e.g., from work to family) in reaction to work- family conflict. Therefore, future research extending the current study by looking at non-job related affect may shed further light on the mechanisms.

In addition, the present study examined whether the mediational effects are conditional on gender. In light of reviewed studies that suggest women generally tend to rate their life events as less controllable and they seem to be more reactive to different traffic-related triggers, we expected the mediation effect would be stronger for females. However, the results of this study do not seem to support this idea. Instead, the findings suggest the

indirect effects of the relationship between FIW and dangerous driving behaviours via job affect occurs in males but not females. In particular, we found one path differentiated males from female; suggesting events related to FIW significantly shape the development of negative emotions at work among males only. Although a definitive explanation for this particular finding is not possible, such findings may suggest that negative family-to-work spillover as one of the underlying mechanisms for gender differences in risky decisions and actions during driving. Because males are the ones typically needing to prioritise work domain over family, it is plausible to assume that they may react more negatively to family intrusions into work. This is consistent with Livingstone and Judge (2008) who found that men with traditional gender roles are more likely to experience guilt (a specific negative emotion) in response to FIW than WIF, suggesting that men seem to be most affected by the pressure of FIW than women.

4.1 Limitations and Future Directions

There are several limitations to this study. First, the measures were self-reported. Hence, issues such as recall bias and social desirability bias are of particular concern. Future research should include objective measures and multiple methods such as physiological indicators of stress and negative affect wherever possible (Cottrell & Barton, 2013). Next, while the model is conceptualized in terms of cause and effect, the design of the study was cross-sectional, which prevents the drawing of causal inferences. The use of cross sectional research using SEM can shed light on possible mechanisms which need to be confirmed in longitudinal studies for stronger inferences about causal direction and to better examine the long-term effect of combining work and family life on driving behaviours. A daily diary study investigating the dynamic processes underlying within-person, day-to-day co-variation might help advance this research.

In this study, we suggest the negative implications of job related negative affect as an immediate response to work-family conflict. Prior research however, has shown that certain negative emotions even have opposing effects, including adaptive behaviours such as increased engagement and self-development (Speights et al., 2019). For instance, negative emotional states may lead people to work harder because it signals a problematic environment (Grichnik, Smeja, & Welpe, 2010). Another set of studies showed that negative emotions such as anxiety have been shown to have a positive effect on driving due to fearful evaluation (Lerner & Keltner, 2001) and elevated risk perception (Mesken et al., 2007). Given the fact that it is not possible to fully embrace the complexity of role negative affect within a single study, more work remains to be done to explore the moderating factors that might explain the influence of negative affective states within the driving behaviour context. Future studies should also examine the role of positive affect. Alongside the paucity of research on the influence of positive affect, research suggests that positive emotions appear to play a role in the willingness to drive recklessly, risky driving, and commission of traffic violations (Armitage, Conner, & Norman, 1999; Rhodes & Pivik, 2011). For example, a study by Jeon et al. (2014) reported that positive emotions such as happiness were related to degraded driving performance, in that the generic effects of positive moods on driving are associated with higher levels of driving confidence and safety.

Finally, this study is the first to examine the ability of work-family conflict to predict dangerous driving, but it is not on its own sufficient. A worthwhile agenda for future research would be to explore the role of potential variables including a diversity of work-related demands including shift work and longer working hours, and family-related characteristics, as well as the roles of duration, distance in commuting, and traffic congestion. Future research using this framework should also focus on objectively assessed outcomes, such as traffic violations and involvement in road accidents.

4.2 Implications for Practice

Overall, both national policy and organization implications stem from our findings. Growing evidence of the detrimental consequences of work-family conflict, particularly FIW, on health-related behaviours and safety, including the results of the present study indicates that it is time to enhance current policies to support employees' family responsibilities. National policies of family-supportive work environments may include, for example, childcare facilities and flexible scheduling that provide employees with greater control over their non-work schedules, which may make it easier for them to manage their family roles and may have important benefits in reducing the degree of dangerous driving carried out by drivers. At organizational level, strengthening the psychosocial safety climate, would be one of the important targets for interventions promoting better road safety, especially in mitigating the negative consequence of work–family conflict and negative affect at work. This includes for example, training courses focusing on awareness of the spillover of work related moods and pressures in work and family to impact on driving. Previous research has documented the importance of safety climate of organizations such as good leadership and co-workers support in prediction of employee's safety behaviours and outcomes (Bronkhorst, 2015). For instance, Amponsah-Tawiah and Mensah (2016), found that organizational safety climate reduces the extent to which drivers engage in unsafe work-related driving. Their study suggests that the decision to drive safely under work pressure is based on the extent to which organizations prioritize safety practices. Given that there are substantial individual differences in appraisal and coping, interventions will often be more effective when they are targeted at vulnerable drivers (Matthews, 2002), targeting those with work-life balance issues. Furthermore, our results suggest gender differences in the influence of negative family to work spillover on driving behaviour, which highlights this issue in male drivers as an important concern for road safety. Hence, there is also a need for programs that emphasize

the self-regulation of emotions (Rowden et al., 2011) and effective coping strategies in dealing with situational triggers including time pressure, emotional fatigue and negative mood during driving experience drivers targeting male drivers.

5 CONCLUSION

Our paper makes a unique contribution to the work family literature in that it is the first paper to look at the psychological effects of juggling work and family roles on traffic safety and has a number of novel findings. The results provide evidence that dangerous driving is predicted by FIW, but not by WIF. Both forms of conflict have indirect effects on unsafe driving that were explained by job-related negative affect, supporting our theoretical rationale. Furthermore, gender differences emerged that suggest that the stress of work-family conflict may influence driving behaviour differentially in male and female drivers.

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CONFLICT OF INTEREST

All authors have no conflict of interest to declare.

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TABLE 1 Measurement statistics.

Construct		Factor Loading λ (>.60)	CR (>.60)	AVE (>.50)	$\sqrt{\text{AVE}}$
Negative affect	I have felt nervous	0.60	0.92	0.59	0.77
	I have felt depressed	0.89			
	I have felt anxious	0.67			
	I felt dejected	0.83			
	I felt tense	0.84			
	I felt despondent	0.82			
	I felt worried	0.79			
	I felt hopeless	0.70			
WIF	My work keeps me from my family activities more than I would like.	0.74	0.92	0.60	0.77
	The time I must devote to my job keeps me from participating equally in household responsibilities and activities.	0.68			
	I have to miss family activities due to the amount of time I must spend on work responsibilities.	0.65			
	When I get home from work I am often too frazzled to participate in family activities/responsibilities.	0.78			
	I am often so emotionally drained when I get home from work that it prevents me	0.78			

	from contributing to my family				
	Due to all the pressures at work, sometimes when I come home I am too stressed to do the things I enjoy	0.90			
	Due to stress at home, I am often preoccupied with family matters at work.	0.84			
FIW	Because I am often stressed from family responsibilities, I have a hard time concentrating on my work.	0.82	0.90	0.72	0.85
	Tension and anxiety from my family life often weakens my ability to do my job.	0.89			
	The time I spend on family responsibilities often interfere with my work responsibilities.	0.87			
	The time I spend with my family often causes me not to spend time in activities at work that could be helpful to my career.	0.65			
	I have to miss work activities due to the amount of time I must spend on family responsibilities.	0.63			
Driving (Aggressive)	I make rude gestures toward drivers who annoy me.	0.62	0.87	0.51	0.71
	I deliberately use my car to block drivers who tailgate me.	0.68			
	I would tailgate a driver who annoys me.	0.75			
	I feel it is my right to strike back in some way, if I feel another driver has been aggressive toward me.	0.76			
	When someone cuts me off, I feel I should punish him/her	0.75			
	I drag race other drivers at stop lights to get out front.	0.70			
	I will illegally pass a vehicle (car/lorry) that is going too slowly.	0.66			
	I will cross double lines to see if I can	0.54			

	pass a slow moving vehicle (car/lorry).				
Driving (Cognitive/ Emotional)	When I get stuck in a traffic jam I get very irritated.	0.79	0.87	0.53	0.73
	I get impatient and/or upset when I fall behind schedule when I am driving.	0.81			
	I get irritated when a vehicle in front of me slows down for no reason.	0.76			
	I feel that passive drivers should learn how to drive or stay home.	0.73			
	I feel that I may lose my temper if I have to confront another driver.	0.69			
	I flash my headlights when I am annoyed by another driver.	0.57			

Notes: WIF = work intereference with family; FIW= family intereference with work

TABLE 2 Means, standard deviations, and correlations for scales variables.

Construct	Mean	SD	1	2	3	4
1.Negative Affect	18.39	6.54	**(0.773)**			
2. FIW	13.37	4.67	0.43**	**(0.85)**		
3. WIF	16.72	5.41	0.36**	0.56**	**(0.771)**	
4. Driving	30.30	9.51	0.56**	0.43**	0.35**	**(0.92)**

Notes: **p <0.01; diagonal in parentheses: square root of average variance extracted from observed variables; off-diagonal: correlations between constructs.

TABLE 3 SEM results

Hypotheses	Path	Coefficient (β)	Std. estimate	Results
H_1	Driving <--- WIF	0.06	0.03	Rejected
H_2	Driving <--- FIW	0.25***	0.03	Confirmed
H_3	Affect <--- WIF	0.35***	0.04	Confirmed
H_4	Affect <--- FIW	0.19***	0.04	Confirmed
H_5	Driving <--- Affect	0.41***	0.05	Confirmed
Control variable	Driving<--- Gender	-0.26***	0.04	
Control variable	Driving<--- Age	-0.04	0.00	
Control variable	Driving <--- Marital status	-0.03	0.05	
Control variable	Driving <--- Children	0.07	0.01	

Notes: WIF = work intereference with family; FIW= family intereference with work; Children = number of children. *p < .05, **p < .01, ***p <.001

TABLE 4 Moderated mediation (Gender)

Hypotheses		Males		Females		Z-score
		Coefficient (β)	SE	Coefficient (β)	SE	
H_8	Driving <--- WIF	0.01	0.11	0.01	0.16	0.13
	Affect <--- WIF	0.20***	0.06	0.28***	0.06	0.93
	Driving <--- Affect	0.37***	0.08	0.26**	0.05	-1.10
H_9	Driving <--- FIW	0.19	0.16	0.12	0.29	-0.20
	Affect <--- FIW	0.22***	0.05	0.03	0.05	-2.47**
	Driving <--- Affect	0.37***	0.08	0.26***	0.05	-1.10

Notes: SE = Standard Estimate; WIF = work intereference with family; FIW= family intereference with work