

# Northumbria Research Link

Citation: Scholarios, Dora, Hesselgreaves, Hannah and Pratt, Raymond (2017) Unpredictable working time, well-being and health in the police service. *The International Journal of Human Resource Management*, 28 (16). pp. 2275-2298. ISSN 0958-5192

Published by: Taylor & Francis

URL: <https://doi.org/10.1080/09585192.2017.1314314>  
<<https://doi.org/10.1080/09585192.2017.1314314>>

This version was downloaded from Northumbria Research Link:  
<http://nrl.northumbria.ac.uk/id/eprint/45145/>

Northumbria University has developed Northumbria Research Link (NRL) to enable users to access the University's research output. Copyright © and moral rights for items on NRL are retained by the individual author(s) and/or other copyright owners. Single copies of full items can be reproduced, displayed or performed, and given to third parties in any format or medium for personal research or study, educational, or not-for-profit purposes without prior permission or charge, provided the authors, title and full bibliographic details are given, as well as a hyperlink and/or URL to the original metadata page. The content must not be changed in any way. Full items must not be sold commercially in any format or medium without formal permission of the copyright holder. The full policy is available online: <http://nrl.northumbria.ac.uk/policies.html>

This document may differ from the final, published version of the research and has been made available online in accordance with publisher policies. To read and/or cite from the published version of the research, please visit the publisher's website (a subscription may be required.)



**Northumbria**  
**University**  
NEWCASTLE

**Author Accepted Version**

27 February 2017

Scholarios, D., Hesselgreaves, H., & Pratt, R. (forthcoming) Unpredictable working time, wellbeing and health in the police service. *International Journal of Human Resource Management*.

**Unpredictable Working Time, Wellbeing and Health in the Police Service**

Dora Scholarios

*Department of Human Resource Management, University of Strathclyde, Glasgow, Scotland*

Hannah Hesselgreaves

*Institute of Health and Wellbeing, University of Glasgow, Glasgow, Scotland*

Raymond Pratt

*Scottish Women's Institutes in Scotland, Edinburgh, Scotland*

# Unpredictable Working Time, Wellbeing and Health in the Police Service

## Abstract

The unpredictability of working time is a seldom studied, but increasingly prominent, feature of employment across occupations, including those where nonstandard or unsocial hours have become the norm. This paper proposes that unpredictability which is driven by employer demands for flexibility (e.g. scheduling practices) is associated with greater employee work-life conflict and perceived stress. This, in turn, has implications for health behaviour (alcohol consumption, sleep disturbance) and symptoms (digestive and cardiovascular problems). Increasing employee control through flexible working arrangements is examined as a potential moderator. We also examine the possibility that alcohol consumption exacerbates the negative effects of unpredictability on wellbeing and health. A survey of 1207 police officers, for whom working unsocial hours is commonly accepted, showed direct effects of unpredictability over and above nonstandard hours on digestive health, and indirect effects through wellbeing on sleep, digestive and cardiovascular health. In some cases, these indirect effects were reduced or absent with greater employee control through flexible working arrangements, although this was not uniform. The interaction of alcohol consumption was found to intensify the negative effects of unpredictability on wellbeing and some health outcomes. The findings reflect a tension between employer-centred strategies for enhancing workforce flexibility and flexibility practices which purport to provide employees with greater control and work-life balance. They are consistent with wider increasing strategic pressures towards employer-centred flexibility and suggest a challenge for sustaining employee wellbeing as working time becomes more unpredictable.

**Keywords:** Non-standard working time; flexibility; shift working; wellbeing; health; police

## Introduction

This article examines the effects of unpredictable working hours on employee wellbeing and health. Our use of the term unpredictability is distinct from that implied by precarious or insecure work (Kalleberg and Hewison, 2013; Rubery, Ward, Grimshaw, and Benyon, 2005). Unpredictable hours may arise across employment contexts, including managerial or professional work (McCann, 2007), wherever employees experience short notice to changes in start or finish times or variability in the days worked each week. Persistent variability is argued to exacerbate work-life conflicts, but is often neglected in studies of working time (Henly and Lambert, 2014).

Building on conceptualisations of working time quality (Green et al., 2013), we define unpredictability as comprising both extended hours and lack of employee control over scheduling. Unpredictability may arise from a number of sources (e.g. shift changes, overtime). As well as the direct consequences of extended hours for non-work life, we argue that an accumulation of unpredictability leads to negative consequences for employee wellbeing. National trends suggest increasing use of employer-centred flexibility strategies,

such as mandatory overtime, to accommodate fluctuations in business activity (Eurofound, 2015; Richbell, Brookes, Brewster and Wood, 2011). In many cases, these trends challenge the recommendations of the EU's Working Time Directive (Directive 2003/88/EC) for a maximum 48-hour working week, including overtime, rest periods and breaks.

By focusing on unpredictability rather than non-standard or atypical working hours, we contribute in several ways to existing knowledge on the effects of working time. First, while there is considerable evidence on how shift systems, and long or unsocial hours affect family and social life, or physical health (Angrave and Charlwood, 2015; Artazcoz, et al., 2013), there have been few studies of the unpredictability generated by employer-centred flexibility (exceptions include Costa, Sartori, and Akerstedt, 2006; Eurofound, 2012; Henly and Lambert, 2014). We develop hypotheses linking unpredictability to work-life disruption, subjective wellbeing and physical health symptoms generally associated with shiftworkers (sleepiness, digestive and cardiovascular problems) (Barton, et al., 1995; Costa, et al., 2006). Drawing from shiftwork research, we also include individual coping behaviour as a health-related outcome and moderating factor. Our particular interest is in alcohol consumption as this has been found to be a common response to job stressors which exacerbates working time pressures.

Second, we also consider the potential positive effects of flexible working arrangements (FWAs). This allows us to address the effects of both employer- and employee-centred working time strategies, which have been identified as distinct bundles of working time arrangements (Chung and Tijdens, 2013). Literature differentiates variability controlled by employers from employee-led flexibility, showing the former to be associated with negative wellbeing and health and the latter with more positive outcomes (Costa, et al., 2004; Kattenbach, Demerouti, and Nachreiner, 2010). Few studies, however, have considered systems where 'variability' and 'flexibility' co-exist in attempts to balance the flexibility needs of employers and employees (Tucker and Folkard, 2012).

Finally, the empirical focus of the study, based on data from a large-scale survey of four UK police services, presents a valuable context for examining the tension between employer- and employee-centred flexibility. By focusing on a single occupation, we reduced potential variability in shift patterns and working environment to focus on how unpredictability seeps into regular work hours. The police culture also provides an appropriate test bed for the possibility that unpredictability is an integral demand of working life to which employees simply adjust (Turnbull and Wass, 2015). Unsocial hours are an expectation for police officers, as in many other employment contexts. The present study raises the possibility that unpredictability has negative consequences which go beyond the known effects of unsocial hours. Moreover, although literature suggests a compensating effect when employee-centred flexibility arrangements are available, there is no guarantee that employees are encouraged or feel empowered to adopt these. Cost-cutting pressures, for instance, have resulted in a withdrawal of employer commitment to flexible working hours (Hofacker and Konig, 2013); and within policing, requests for flexible working sit uneasily against the dominant norms of full-time work (Dick, 2009). Thus, the context demonstrates the tensions between employer

operational demands and employee welfare, which has only been heightened by a climate of austerity (Loveday, 2015).

The article begins by specifying our definition of unpredictability, before reviewing the literature on which we base our hypotheses linking unpredictability to wellbeing and health. We then present the survey of UK police services and hypothesis testing which allows us to draw conclusions for managing wellbeing in light of this intensifying, but little studied, feature of working time.

### ***Unpredictability and the quality of working time***

Working time is becoming increasingly irregular and flexible (Beckers, Kompier, Kecklund and Härmä, 2012). Flexibility driven by employer needs to meet service demands is most often reflected in the duration and sequencing of shifts where demand peaks are met through varying shift start/finish times or multiple overlapping shifts (Van den Bergh, et al., 2013). Scheduling is also affected by other constraints, such as hiring or training flows, employee preferences, and sickness absence. As a result, for many employees, unexpected variations are an inevitable feature of work (Otterbach, 2010; Lambert, 2008). For example, variation in the number of arrests made in policing or a peak in the number of patients admitted in hospital, as well as the distribution of demands (e.g., arrests made at the end of a shift, attending court in the morning), contribute to unpredictability. Even a trend towards self-rostering, which is a form of negotiated work scheduling offered by employers to enable greater employee-led flexibility, has been associated with poor satisfaction due to employer/co-worker constraints (Ingre, Aksertedt, Ekstedt, and Keckland, 2012).

Lambert (2008) warns that many studies underestimate the prevalence of variability given these fluctuations are not directly measured. Recent attempts to measure working time quality include both duration of working hours and schedule predictability, such as notice given by employer (Green, et al, 2013). Extended hours may apply to a single shift, as in work overflowing beyond the formal boundaries of the shift's completion, or the need to work overtime. With persistent variability, however, there may be a reduction in porosity across a shift pattern with less time for recovery. Such lack of individual control over hours and inadequate recovery time has negative health implications (Härmä, 2006), suggesting that it is the accumulation of variability which is problematic.

### ***Unpredictability, work-life conflict and perceived stress***

The psychosocial impact of shiftwork, working nights, and long or unsocial hours have been well established (Chung and Tijdens, 2013). This research points to an extensive range of psychological, physical and behavioural manifestations of health problems. Night work and unsocial hours are associated with time-based work-home interference and conflict, notably amongst women (van Amelsvoort et al., 2004). With respect to the variability of working time, attention has focused on the spillover from work to family or life experiences (Allen, Johnson, Kiburz, and Shockley, 2013; Kattenbach, Demerouti, and Nachreiner, 2010). The

effects of schedule flexibility on both time-based conflict and perceived stress also have been shown (e.g. Grzywacz, Carlson and Shulkin, 2008; Nabe-Nielsen, Garde, Aust, and Diderichsen, 2011).

Henly and Lambert (2014) identify both time-based and strain based work-life conflict as resulting from limited advance notice of schedule changes. Unpredictability also contributed additively to the explanation of work-life conflict for their sample of female retail workers - as the number of sources of unpredictability in scheduling increased, the greater the levels of work-life conflict. Larger scale European data confirm these findings. Short notice of changes to work schedules (e.g. being notified on the same day or day before) was found to disrupt work-life balance across occupations (Eurofound, 2012, p.92); and, consistent with Henly and Lambert's findings, such scheduling arrangements were a more significant predictor of work-life balance than simply the presence of atypical hours (weekend/night work). The European data also confirmed that working in one's free time to meet work demands has increased, with one in three workers reporting this happens at least once or twice a month.

The present study is concerned with the effects of unpredictability which includes both extensification and variability of hours. Work-life conflict is an indicator of extensification which makes non-work arrangements, such as childcare, harder to manage (Eurofound, 2012). In addition, time variability seems to act as a potential stressor (Costa, et al., 2006; Demerouti, et al., 2004). Thus, we hypothesise that unpredictability will have an incremental effect beyond unsocial hours on both work-life conflict and the degree of perceived stress generally.

H1: Greater unpredictability of working hours is related to greater work-life conflict (H1a) and greater perceived stress (H1b), over and above the effects of working unsocial hours (night or weekend work).

### ***Health and coping behaviour***

Working time arrangements have been shown to have a direct effect on a number of health outcomes. Shiftworkers, compared to their non-shift working counterparts, exhibit a range of health risks, including sleep disturbance, somatic complaints (gastrointestinal), cardiovascular disease, increased caffeine and alcohol consumption, and risk of breast cancer (Hansen and Stevens, 2012; Rajaratnam, et al, 2011; WHO, 2008; Härmä, 2006; Golden, 2015).

Generally, schedule flexibility and control is linked to fewer symptoms of physical ill-health and fewer absences due to sickness (Ala-Mursula, et al., 2002; Nijp et al., 2012). Individuals with fixed start and finish times report less anxiety and fatigue, lower incidence of heart disease and better sleep quality (Costa, et al., 2004). Unpredictable hours also adversely impact eating patterns and diet (Dixon et al, 2014).

The impact on sleep quality has received particular attention. A compressed working week (working all weekly hours in five days or less) improved some health indicators among police officers, but not sleep quality (Bambra, et al., 2007). Generally, research recommends shorter (e.g. eight hour) rather than longer shifts, regularity in shift schedules, and at least 12 hours of rest between shifts (Pallesen, et al., 2010). Such regularity and rest periods are likely to be sacrificed as unpredictability increases.

Shiftworking also tends to reduce access to resources that may mitigate its negative effects, such as exercise and nutritious meals; hence, alcohol, nicotine, and caffeine are often used as strategies to cope with unsociable hours and inadequate sleep (Härmä, 2006). These coping behaviours have negative associations with wellbeing (Smith, et al., 2005), specifically in policing where stress and maladaptive behaviour, including problem drinking, have been linked (Kohan and O'Connor, 2002).

### ***Explaining health outcomes through wellbeing***

Psychological wellbeing is now accepted as a precursor of a number of health outcomes, such as longevity, physical health, and health behaviour (e.g., alcohol use) (Freidli 2009). It is appropriate, therefore, to consider work-life conflict and subjective wellbeing as mediators of the relationship between unpredictable hours and health. Work-life conflict has a negative effect on employee health, especially influencing sleep patterns (Eby, et al., 2005) and mediates the relationship between job demands and health (van Veldhoven and Beijer, 2012). Hämmig and Bauer (2013) also found that work–life conflict was the only psychosocial factor significantly and strongly associated with all studied health outcomes - self-rated health, sickness absence, musculoskeletal disorders, sleep disorders, stress and burnout.

Perceived stress appears to play a role in explaining how employee experiences shape health. Ganster and Rosen's (2013) review found a strong link between work-related stressors and self-reported affective outcomes. Although a weaker link was shown for short-term physical responses and complaints, meta-analysis has found that high perceived stress (not just work-related) is associated with moderate increases in heart disease risk (Richardson, et al, 2012).

Thus, as well as considering the direct effects of unpredictability on health outcomes, we examine the contribution of work-life conflict and perceived stress as mediators of the relationship between unpredictability and health. In addition, focusing specifically on alcohol use given its high incidence amongst shiftworkers and police officers (Ménard and Arter, 2013), we propose two effects; firstly, that it will be a behavioural response associated with poor quality of working time (Kohan and O'Connor, 2002), in this case measured in terms of unpredictability, and secondly, a feedback influence further intensifying the effects of negative wellbeing on health. These relationships are represented in the following hypotheses (see also Figure 1).



H2: Unpredictability is related to negative health outcomes, particularly greater alcohol consumption (H2a); greater sleep disturbance (H2b); more digestive health problems (H2c); and more cardiovascular problems (H2d).

H3: The relationships between unpredictability and poor health in H2 are mediated by work-life conflict (H3a) and perceived stress (H3b).

H4: Greater alcohol consumption will strengthen the direct effect of unpredictability on poor health (H4a) and the indirect effects of unpredictability on poor health through work-life conflict (H4b) and perceived stress (H4c).

### ***The effects of employee-centred flexibility***

Employee-centred flexible working arrangements (FWAs) provide employees with greater autonomy in work scheduling, most commonly, choice over core hours and start/finish times through reduced or flexible hours (Chung and Tijdens, 2013). The extent to which these are available is determined, partly, by national regulatory frameworks. In some countries, such as the UK, managers have greater discretion in whether they apply statutory provisions regulated by the state, and are entitled to decline requests for flexible options based on business need (Fagan and Walthery, 2013). In the public sector, flexibility is regarded as necessary for equality and diversity agendas (Gardiner and Tomlinson, 2009) with women in particular increasingly regarding flexible working as an entitlement (Atkinson and Hall, 2009).

Where FWAs exist and are taken up by employees, the increase in schedule control has been shown to benefit employee wellbeing, especially when combined with low variability in working hours (Costa, et al., 2004; Tucker and Folkard, 2012). Thus, we propose that employees working on FWAs will not experience the hypothesised negative effects of unpredictability on wellbeing, and in turn health, as acutely as those who do not work FWAs.

H5: Working on a FWA will weaken the positive relationship between unpredictability and poor health (H5a), and the indirect effects of unpredictability on poor health through work-life conflict (H5b) and perceived stress (H5c).

[Figure 1 near here]

## **Method**

### ***Police context and sample***

The study was based on a survey of police officers in four UK forces, one large urban/suburban force and three smaller rural/suburban forces. Police officers are required to work shifts as part of their working routine. The preferable shift pattern in the UK is the Variable Shift Arrangement (VSA) on the grounds of demand-supply during periods of intense activity

as this provides three-month duty rosters using shifts of greater than eight hours (Home Office, 2004). In conjunction with VSAs, most forces operate a mixture of part-time, flexible and compressed hours. Flexible working is negotiated individually between the officer and their supervisor, with some forces requiring a percentage of the flexible hours during unsocial hours (evenings/weekends and nights) (Home Office, 2007).

An online survey, with two email reminders, was administered in 2011 to officers across all departments via several Force communication media. Paper versions were also available. Response rates varied from 45 per cent for the smallest force to a mean of 27 per cent for the other three, a rate typical for online surveys (Johnson and Wislar, 2012). There was no bias evident in the respondent profile given Force characteristics. Only those working full-time on VSAs were included in the study to avoid confounding the definition of unpredictability. The final sample size was 1207, with the majority (77%) working VSAs without flexible arrangements. Compared to those working FWAs, this group carried out significantly more night work (69 versus 42 per cent) and worked 3.99 versus 3.63 weekend days per month (Table 1).

### ***Measures***

*Unpredictability index.* The index (0-22) was made up of the sum of six items designed to reflect the degree to which the overall shift pattern resulted in unpredictability ( $\alpha=.73$ ). Consistent with other quality of working time measures (e.g. Green, et al., 2013) the index captured both duration and scheduling of hours. An original nine items were developed covering extended hours (e.g., being detained at the end of a shift) and extent of deviation from EU Working Time Regulations. These were reduced to six following exploratory factor analysis showing a single dimension and greater variance explained when three items relating to night work were removed (night work was included as a control variable). The six items were: times per week on average detained at end of shift (never (0), 1/week (1), 2/week (2), 3-7/week (3)); minutes detained on average at end of shift (none (0), up to 30 mins (1), 30-60 minutes (2), 60-90 minutes (3), 90-120 minutes (4), over 120 minutes (5)); overtime (none (0), <4 hours/week (1), 4 or more hours per week (2)); and three items on frequency of experiencing (a) <11 hours rest between tours of duty; (b) work shifts of >10 hours; and (c) not having one day off between work periods (all measured as almost never (1), a few times per year (2), a few times per month (3), several times per month (4)).

*Unsocial hours.* These were measured by two variables: (a) night worker (0/1), defined as being rostered for at least three hours between 24:00 and 03:00 and working at least four night shifts in a row 'a few' or 'several' times per month; and (b) the number of weekend days usually worked each month (0-8).

*Work-life conflict.* Netemeyer, Boles, and McMurrian's (1996) five items measuring work interfering with home and family life were used (e.g., 'The demands of my work interfere with my home and family life'; seven-point scale from 'strongly disagree' (1) to 'strongly agree' (7)). A composite score was calculated as the item mean ( $\alpha=.91$ ).

*Perceived stress.* The four-item version of the Perceived Stress Scale (Cohen et al., 1983) was used to measure how respondents appraised their feelings and thoughts in the last month (e.g., ‘How often have you felt you were unable to control the important things in your life?’; five-point scale from ‘never’ (1) to ‘almost always’ (5)). A composite score was calculated as the item means ( $\alpha=.70$ ).

*Flexible Working Arrangements (FWA).* Respondents were asked if they worked a FWA (0/1, 1=yes). Given our sample included only full-time officers on a VSA this referred to particular types of requests for a reasonable adjustment to hours (e.g., Time Off In Lieu, shift adjustments such as early start to accommodate family demands or late shifts to accommodate a disability; e.g., arthritis which may be worse in the morning).

*Alcohol consumption.* Consistent with shiftworker/sleep studies (Bambra et al., 2007; Smith, et al., 2005), we used single items for self-reported active coping behaviours (e.g., caffeine intake, exercise). In this analysis, we focus only on alcohol use. Respondents indicated the number of units of alcohol they drink per week, where a unit was ½ pint lager/bitter, one glass of wine or one measure of spirit.

*Sleepiness across a shift.* This captured whether sleep is enough overall across a shift consistent with the summary measure used by Amendola, et al. (2011). It was computed from the sum of three items enquiring about alertness or sleepiness at the beginning, middle or end of shift taken from the scale of sleep disturbance in the Survey of Shiftwork (Barton, et al., 1995). Each item was scaled from ‘very alert’ (1) to ‘very sleepy’ (9) (final summed scale 1-27).

*Digestive and cardiovascular problems.* The Survey of Shiftwork’s Physical Health Questionnaire (Barton, et al., 1995) sub-scales of gastrointestinal and cardiovascular disorders were adapted using three and five items, respectively (e.g. ‘How frequently do you experience disturbed appetite’ (digestive problems); ‘How frequently do you experience aches and pains in your chest’ (cardiovascular problems’); scale of ‘never’ (0) to ‘almost always’ (5)). There is general confidence in subjective health measures which have been validated against other indicators (Ala-Mursula, et al., 2002; Idler and Benyamini, 1997).

#### *Control variables*

We controlled for: the number of months on the shift pattern; tenure with police (measured on a four-point ordinal scale (‘less than 5 years (1), 5-10 years (2), 10-15 years (3),’ 15 years or more’ (4)); age (in years); gender (0/1, 1=female); one or more dependent relatives (0/1); and whether respondents were married/cohabiting (0/1). Each of these variables has been shown to impact responses to shiftwork and working unsocial hours (see review by Tucker and Folkard, 2012). The analyses for H2-H5 controlled for night and weekend work.

### *Analytical strategy*

The hypotheses were tested using hierarchical regression analysis (H1), a parallel multiple mediation model (H2 and H3) and a moderated mediation model (H4 and H5), all with control variables included. The mediation and moderated-mediation models were estimated using the SPSS PROCESS macro developed by Preacher and Hayes (2008).

The possibility of common method variance (CMV) resulting from the single self-report questionnaire was addressed firstly, through proximal separation of items on working time, work-life conflict, stress and health in the questionnaire; secondly, by ensuring that response scales for each were different; and thirdly, through Harman's single-factor test (Podsakoff, et al., 2003). Exploratory factor analysis with no rotation of the unpredictability, wellbeing and health measures indicated that a single factor accounted for 28.11% of the total variance. As this is not the majority, it is unlikely that responses to the health outcomes will be influenced by CMV arising from the self-report measures of time and wellbeing.

### **Results**

Descriptive statistics (Table 1) indicate partial support for the hypotheses. Unexpectedly, unpredictability was highest for the FWA group ( $t(1137)=-2.94, p<.001$ ), but, generally, was higher for those with longer tenure and older officers, and positively related to work-life conflict. For the FWA group, females reported lower unpredictability ( $r=-.10, p<.01$ ) and unpredictability was inversely related to alcohol consumption ( $r=-.06, p<.05$ ). In contrast, for the non-FWA group, unpredictability was related to digestive health problems ( $r=.14, p<.001$ ). No other correlations between unpredictability and wellbeing/health variables were significant. Work-life conflict and stress were positively correlated with sleepiness, digestive problems and cardiovascular problems, as expected. Alcohol consumption was more strongly related to outcomes for the FWA group, particularly work-life conflict ( $r=.25, p<.001$ ), stress ( $r=.11, p<.05$ ), sleepiness ( $r=.18, p<.05$ ) and cardiovascular health problems ( $r=.25, p<.001$ ). A similar pattern although weaker relationships, and excluding stress, was shown in the non-FWA group. In both cases, alcohol use was greater amongst older men, and those with longer tenure.

[Table 1 near here]

Table 2 shows that H1a and H1b were supported when unpredictability was added (in Step 2) to the equation containing night and weekend work (Step 1). Unpredictability was significantly related to work-life conflict ( $\beta =.13, p<.001$ ) and perceived stress ( $\beta =.06, p<.05$ ). Weekend work also had an independent and consistent positive effect on both; night work was not significant. Adding the interaction between unpredictability and working on a FWA (equation not shown) was non-significant for work-life conflict ( $\beta =-.02, p=.58$ ) and perceived stress ( $\beta =-.02, p=.59$ ) confirming that unpredictability had similar effects on wellbeing regardless of whether individuals worked a FWA.

The multiple mediation model (Table 3) represents the effects of unpredictability on each health variable through three pathways (one direct from unpredictability to health, and one for each mediator). Coefficients represent regression weights of the expected changes in health with each point increase in unpredictability. For H2, a significant result was found only for the prediction of digestive problems ( $\beta = .07$ ,  $SE = .02$ ). The bootstrapped confidence intervals are entirely above zero indicating with 95% confidence that the estimate is significantly different from zero. For all other outcomes, the confidence intervals for the direct effect of unpredictability straddled zero. Thus, there was no evidence that unpredictability directly influenced alcohol consumption (H2a), sleepiness (H2b), or cardiovascular health (H2d).

[Table 2 near here]

[Table 3 near here]

Indirectly, unpredictability affected three of the four health outcomes (Table 3). There were no indirect effects of unpredictability on alcohol consumption; however, there was a positive indirect effect of unpredictability on sleepiness, digestive and cardiovascular problems through both work-life conflict (H3a) and perceived stress (H3b). Positive coefficients indicate that unpredictability resulted in greater work-life conflict and stress, which in turn resulted in greater health problems. For example, in the model for digestive problems, both work-life conflict ( $\beta = .02$ ,  $SE = .01$ ) and stress ( $\beta = .01$ ,  $SE = .01$ ) accounted for a significant positive indirect effect of unpredictability on poor digestive health. For sleepiness, digestive and cardiovascular health problems, the total model including unpredictability and mediators was significant and led to an increment in  $R^2$  compared to the model only containing unpredictability (sleepiness:  $R^2 = .21$ ,  $\Delta R^2 = .16$ ; digestive problems:  $R^2 = .23$ ,  $\Delta R^2 = .16$ ; cardiovascular problems:  $R^2 = .21$ ,  $\Delta R^2 = .14$ ). Thus, H3a and H3b were supported.

Considering alcohol consumption (AC) (H4) and the FWA condition (H5) as moderators in the equations for sleepiness, digestive and cardiovascular health (equations not shown), AC was positively related to work-life conflict ( $\beta = .08$ ,  $SE = .04$ ,  $p < .05$ ), sleepiness ( $\beta = .24$ ,  $SE = .03$ ,  $p < .05$ ) and cardiovascular problems ( $\beta = .23$ ,  $SE = .10$ ,  $p < .05$ ), but not to stress or digestive problems. Working on a FWA had a positive relationship only with stress ( $\beta = .14$ ,  $SE = .05$ ,  $p < .01$ ). The interactions between unpredictability and AC (H4a) and unpredictability and FWA (H5a) for predicting health directly were not supported. However, Table 4 shows first-stage moderation in all equations by way of work-life conflict for those not on FWAs, supporting H4b. Figure 2 shows this visually. The unpredictability coefficient predicting work-life conflict is positive and significant for high ( $\beta = .07$ ,  $p < .001$ ) and moderate ( $\beta = .05$ ,  $p < .001$ ) AC, but not significant at low levels ( $\beta = .03$ , ns). Therefore, the effect strengthens with greater AC for those not on FWAs. Given the absence of an effect for those working FWAs, the greater control may mitigate the effects of unpredictability on work-life conflict, thus supporting H5b.

The conditional indirect effect of unpredictability through stress generally increased with AC although only significantly at high AC and in the absence of FWAs ( $\beta = .03$ ,  $SE = .01$  and  $\beta$

=.04, SE=.02, respectively); i.e., AC increased the positive relationship between unpredictability and stress, supporting H4c for non-FWAs (e.g., for the prediction of sleepiness through stress, the interaction term  $\beta = .02$ , SE=.01,  $t(1179)=2.90$ ,  $p<.05$ ). In addition, for sleepiness, the effect was significant and reversed from negative to positive from low to mean levels of AC but only for the FWA group ( $\beta = -.02$ ,  $\beta = .004$ , respectively). The effect is shown visually in Figure 3. Those working FWAs have generally higher levels of stress overall but at low AC there is a significant inverse relationship between unpredictability and stress ( $\beta = -.02$ ,  $p<.05$ ). At moderate AC the slope becomes significantly positive ( $\beta = .004$ ,  $p<.05$ ) and increases further at high AC, although not significantly. The only significant relationship between unpredictability and stress for the non-FWAs is at the highest levels of AC ( $\beta = -.04$ ,  $p<.001$ ).

[Table 4 near here]

[Figure 2 near here]

[Figure 3 near here]

## Discussion

Unpredictable working time was shown to add incrementally to the effects of working unsocial hours. While night and weekend work were themselves related to stress, sleepiness, and digestive problems (Table 1), the effects of unpredictability seem to penetrate even FWA shift arrangements. As unpredictability increased, police officers were more likely to experience work-life conflict and perceive stress and in turn more digestive and cardiovascular problems. Higher unpredictability was directly related to digestive health problems, and indirectly was associated with sleepiness during work. Importantly, we found some differences in the experience of unpredictability between those working FWAs – where some control over start and finish times could be requested - compared to those where start and finish times were based on duty demands only. One surprising finding was the presence of higher unpredictability, as well as perceived stress and alcohol consumption, amongst the former group, particularly men.

Unpredictability was associated with work-life conflict in both groups, however, only in the absence of FWAs did this explain greater sleepiness, digestive and cardiovascular problems. These results persisted regardless of the level of alcohol consumption for non-FWA officers. For those on FWAs, the same findings were shown only for those reporting higher levels of alcohol use. There were fewer significant findings relating to perceived stress as a pathway to poor health although a notable exception was the case of the non-FWA group with high alcohol consumption where there was a conditional indirect effect on all health outcomes through perceived stress. For the FWA group, significant results were found only for sleepiness at lower levels of alcohol use.

### *Theoretical implications*

The study makes a number of contributions. First, it confirms the importance of including unpredictable working hours alongside concerns about wellbeing linked to long and non-standard working hours. Consistent with other studies (Eurofound, 2012; Henly and Lambert, 2014), we link unpredictability with work-time conflict. We go further, though, in also demonstrating the negative consequences for health, particularly digestive problems. It also shows the psychosocial effects which potentially harm sleep patterns, increase the risk of cardiovascular disease and lead to negative coping behaviours such as alcohol use. These findings add to existing knowledge of how working time affects health (Tucker and Folkard, 2012) by acknowledging the prevalence of time variability in contemporary employment. Existing taxonomies of scheduling may not account for the intrusions of unpredictability, as we demonstrated for our group who had experienced ‘employee friendly’ flexible working.

Second, the findings inform debates about whether flexible working operates to the benefit of the employer or employee. The presumed increased control gained through FWAs did seem to mitigate the effects of unpredictability on work-life conflict as expected, however flexible working itself did not have the health promoting effects which are often proclaimed. Unpredictability, as well as perceived stress and alcohol consumption, were more problematic amongst employees working FWAs. As employer-centred flexible working practices have grown in prominence the extent to which employees actually gain control over their working time, and achieve the promise of work-life balance, has been challenged (Fleetwood, 2007; Russell, O’Connell and McGinnity, 2009). Unpredictability is seldom acknowledged when implementing FWAs, especially if employee preferences are not considered (Swanberg, et al., 2011). For these reasons, Tucker and Folkard (2012) called for more studies examining situations where flexibility co-exists with employer-led ‘variability’.

Our study suggests that employee control over unpredictability remains limited even under FWAs. What we cannot establish from this study is why; it may be employer-driven, driven by work demands, by employees themselves, or unique to the police sample. In many contexts, employees do not exercise their rights to leave work (Allen, Johnson, Kiburz, and Shockley, 2013). In the police, flexible working facilitates work-life balance alongside delivering a demand-led service, and, as such, is considered ‘best practice’ (Home Office, 2007). Dick (2009), however, demonstrated the tensions within the police where managers are required to respond to requests for reduced-hours working, despite the pressures of operational policing. The demand for 24-hour coverage of public sector services in a climate of austerity or front-line services (Henly and Lambert, 2014) makes unpredictability more ubiquitous.

The third contribution of the study is to elaborate our understanding of the effects of shiftwork and FWAs on wellbeing and health. Unpredictability had significant direct and indirect health consequences for our sample, confirming previous research. Tucker and Folkard’s (2012) synthesis of the effects of working time on health identified extended hours as causing fatigue because of the impairment of recovery time. This illustrates how our

measure of unpredictability, which included extended hours, may contribute to sleepiness. In our sample, this happened through stress and work-life conflict, suggesting that unpredictability may limit the availability of time between shifts to relax fully prior to sleeping (Viens, et al, 2003). Rather than discretion reducing work-life conflict, some employees on FWAs still worked hours that further impose on their non-work life and increase fatigue (Eriksen and Keckland, 2007). The link between non-standard hours of work, particularly night work, and digestive problems which has been well established in the literature (Costa et al. 2010; Smith, Folkard, Tucker, and Evans, 2011) was only confirmed for those working FWAs (Table 1). It is likely that for the majority of police officers, who do not work FWAs, unsocial hours are a feature of working life to which they have become accustomed.

Notably, flexible working may be sub-optimal for men, promoting a negative cycle of increased unpredictability, which increases work-life conflict, especially among those with longer tenure. There are several possible explanations. As men take on multiple roles outside employment, work-life conflict increases, which in turn increases the complexity of scheduling, especially if part of a dual income household (Radcliffe and Cassell, 2014). Flexible working may encourage more, rather than merely varied, hours at work, especially in this sample of full-time police officers. Many employees understand the pressures faced by public service employers and believe that their additional contributions are a necessary consequence. The demands of policing as understood by frontline officers, may explain why, especially those with longer tenure, maintain increased working time commitments in spite of health and non-work life consequences. This may manifest through sickness presenteeism (Love, et al., 2010). Finally, the health effects of increasing time-conflicts may affect men more than women, as men typically present late to health professionals with physical or mental symptoms, and continue to operate their lives as normal to fulfil work and non-work commitments (Lee and Owens, 2002).

We caution against extrapolating from the police context. In particular, FWAs have been widely used to denote a reduction in hours for improved work-life balance but this seems not to be the case in policing. Dick (2009) highlights that the ‘dominant order’ may be compromised by flexibility and Silvestri’s (2006) notion of ‘doing time’ for career progression describes cultures of masculinity that thwart references to things female, as FWAs have historically been viewed (Vandello et al, 2013). This offers another explanation for why men in our sample may have used FWAs to increase working time, thus maintaining masculinity.

The higher alcohol consumption for men overall is expected when considering the typical male health behaviours outlined above. This exposes them to negative ways of coping, such as alcohol, which as we have shown exacerbates the effects of unpredictability on stress and work-life conflict (see also Courtenay, 2000). Our findings, thus, provide possible explanations for the often noted problem of alcoholism among police officers.



### ***Implications for HRM***

Managers and HR professionals who operate within the constraints of austerity imposed on the public sector are being asked to expect more work from fewer employees. This context fundamentally shapes the use of variable working time, and has contributed to the increasing use of precarious employment generally. In the police context, compensation for overtime or extended hours occurs only in particular circumstances (Police Negotiating Board agreement, PNB Circular 02/09) which further normalises unpaid overtime (Campbell and van Wanrooy, 2013). Management may consider further whether such ‘extreme work’ should be compensated, or accepted as the new norm.

Where FWAs are offered, employers may underestimate the additive effects that such variability brings to schedules that are already non-standard. As such, health and wellbeing complaints associated with time quality are likely to exist in any front line service organisation operating shift patterns alongside FWAs. Work-life balance policies in police forces have allowed better understanding of the problems faced by employees, as well as maintaining more accurate records about sickness absence (Hayday, Broughton, and Tyers, 2007). However, we show that work-life balance concerns do not stop at sickness absence, but can go on to cause a number of problems related to sleep, cardiovascular/digestive health and alcohol use. This signifies a need to manage scheduling as a possible source of these later problems, to identify signs, such as poorer punctuality or changes to domestic arrangements, and triggers, such as stress and work-life conflict, of future work-induced illnesses, and to pay closer attention to whether all employees can access health-promoting working arrangements (Smithson and Stokoe, 2005).

### ***Limitations and strengths***

Our study is limited by its use of a cross-sectional survey and reliance on self-report measures. Measures of subjective health are acceptable, however, as it has been found to be an independent predictor of mortality (Idler and Benyamini, 1997) and consistent with other measures of health (Ala-Mursula, et al., 2002). Common method variance (CMV) resulting from the single-survey source could inflate relationships, although the avoidance of proximal ordering of our items and tests for a single factor suggest this is unlikely. Siemsen, Roth and Oliviera (2010) also showed that the addition of more variables potentially suffering from CMV deflated bias in regression slopes and that interaction effects cannot be artefacts of CMV. Our study included a number of variables and examined interaction effects. We, nevertheless, acknowledge that alternative sources of data, such as Henly and Lambert’s (2014) use of firms’ posted work schedules to measure unpredictability as well as survey measures, provide a more reliable dataset.

Henly and Lambert (2014) also raised the possibility of reverse causality, where complex non-work lives may preclude individuals experiencing predictable work schedules. We did not test for this possibility, although the finding that those working FWAs experienced higher unpredictability, particularly men, is consistent. We would also argue that our measure of

unpredictability, which built on both extended hours and degree of deviation from the EU Working Time Directive, provided a relatively job-specific measure of experienced unpredictability.

In general, the magnitude of the effects of unpredictability on health are relatively small as indicated by the small coefficients and explained variance. Tucker and Folkard's (2012) synthesis highlighted the complexity of the relationships between working time and health. This may provide some rationale for these small effects indicating that there are other, more significant factors not included in our study. We would argue, nevertheless, that the significant effects are observed over and above the impact of working unsocial hours, highlighting the health risks of unpredictability, particularly through the strong effects observed for work-life conflict and stress.

With regard to the generalisability of the study, its focus on police officers, who operate in a management culture where extensification and intensification of working time are expected, risks context-specific results. Our findings for those working FWAs may be unique to this culture. However, the general findings are likely to apply across employment contexts where employer demands for flexibility are increasing and where employment protections are relatively weak, such as low-skilled work or in particular countries, such as the US (Lambert, Haley-Lock and Henly 2012; Ray, et al., 2010).

## **Conclusions**

This article identifies the dangers of creeping employer-driven flexibility, manifested in unpredictable working time beyond the pressures of long or unsocial hours, for sustaining healthy working lives. Employer demands for flexibility reflect a more general shift from an employee to a strategic focus (Van Buren, Greenwood, and Sheehan, 2011). However, our findings suggest that shifting the adjustment in working hours to employees may be ill-advised given the consequences for wellbeing, health and, most likely, longer term performance.

The findings also challenge the rhetoric of employee-friendly flexible working practices as enhancing employee wellbeing. In practice, flexible working within the context of increasing employer-driven variability may itself be harmful for some groups of employees. Future research should focus on the possible moderating effects of individual differences, which may make some employees more vulnerable to working time variations and more negative health outcomes, coping behaviours (including diet, exercise and self-medicating) and self-rostering. Research focused on the organisational and performance outcomes of unpredictability, such as absence, would also be valuable, given that variable working time is likely to continue to be a more permanent feature of employment.

## References

- Ala-Mursula, L., Vahtera, J., Kivimäki, M., Kevin, M. V., & Pentti, J. (2002). Employee control over working times: associations with subjective health and sickness absences. *Journal of Epidemiology and Community Health*, 56(4), 272-278.
- Allen, T.D., Johnson, R.C., Kiburz, K.M., & Shockley, K. M. (2013). Work–family conflict and flexible work arrangements: Deconstructing flexibility. *Personnel Psychology*, 66(2), 345-376.
- Amendola, K. L., Weisburd, D., Hamilton, E., Jones, G., Slipka, M., Heitmann, A., ... & Tarkghen, E. (2011). *The impact of shift length in policing on performance, health, quality of life, sleep, fatigue, and extra-duty employment*. Washington, DC: Police Foundation.
- Angrave, D & Charlwood, A (2015). What is the relationship between long working hours, over-employment, underemployment and the subjective well-being of workers? Longitudinal evidence from the UK. *Human Relations*, 68(9), 1491–1515.
- Artazcoz, L., Cortès, I., Escribà-Agüir, V., Bartoll, X., Basart, H., & Borrell, C. (2013). Long working hours and health status among employees in Europe: Between-country differences. *Scand J Work Environ Health*, 39(4), 369-378.
- Atkinson, C., & Hall, L. (2009). The role of gender in varying forms of flexible working. *Gender, Work & Organization*, 16, 650–666.
- Bambra, C., Pettecrew, M., Whitehead, M., Sowden, A., & Akers, J. (2007). *Project Final Report. The health and wellbeing effects of changing the organisation of shift work: a systematic review*. Public Health Research Consortium.
- Barton, J., Spelten, E., Totterdell, P., Smith, L., Folkard, S., & Costa, G. (1995). The Standard Shiftwork Index: a battery of questionnaires for assessing shiftwork-related problems. *Work & Stress*, 9(1), 4-30.
- Campbell, I., & van Wanrooy, B. (2013). Long working hours and working time preferences: Between desirability and feasibility. *Human Relations*, 66, 8; 1131-1155.
- Chung, Heejung & Tijdens, K. (2013). Working time flexibility components and working time regimes in Europe: using company-level data across 21 countries, *The International Journal of Human Resource Management*, 24, 7, 1418-1434.
- Cohen, S., Kamarck, T., Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 24, 385-396.
- Costa G, Åkerstedt T, Nachreiner F, Baltieri F, Carvalhais J, Folkard S, et al. (2004). Flexible working hours, health, and well-being in Europe: Some considerations from a SALTSA project. *Chronobiol Int*. 21, 831–44.
- Costa, G., Folkard, S., & Harrington, J.M. (2010). Shift work and extended hours of work. In P. Baxter, P. Adams, T.-C. Caw, A. Cockcroft and J. Harrington (Eds.), *Hunter's diseases of occupation*, 10<sup>th</sup> ed., London: Arnold.
- Costa, G., Sartori, S., & Akerstedt, F. (2006). Influence of flexibility and variability of working hours on health and well-being. *Chronobiology International* 23. 1125–1137.
- Courtenay, W. (2000). Behavioural factors associated with disease, injury and death among men: Evidence and implications for prevention. *Journal of Men's Studies* 9, 1, 81–142.
- Demerouti, E., Bakker, A.B., & Bulters, A.J. (2004). The loss spiral of work pressure, work home interference and exhaustion: Reciprocal relations in a three-wave study. *Journal of Vocational Behavior* 64, 131–149.
- Dick, P. (2009). Bending over backwards? Using a pluralistic framework to explore the management of flexible working in the UK police service. *British Journal of Management*, 20(s1), S182-S193.

- Eby, L.T., Casper, W.J., Lockwood, A., Bordeaux, C., & Brinley, A. (2005). Work and family research in IO/OB: Content analysis and review of the literature (1980 – 2002). *Journal of Vocational Behavior*, 66(1), 124 – 197.
- Eurofound (2015). *Developments in working life in Europe. EurWORK annual review 2014* Publications Office of the European Union, Luxembourg. Accessed at <http://www.eurofound.europa.eu/publications/report/2015/working-conditions-industrial-relations/developments-in-working-life-in-europe-eurwork-annual-review-2014>).
- Eurofound (2012). *Fifth European Working Conditions Survey*. Publications Office of the European Union, Luxembourg. Accessed at <http://www.eurofound.europa.eu/pubdocs/2011/82/en/1/EF1182EN.pdf> (November 2015).
- Fagan, C., & Walthery, P. (2013). Working time capabilities at the workplace: individual adjustment options between full-time and part-time working in European firms. In Hobson, B. (Ed.), *Work-life balance: The agency and capabilities gap*, Oxford University Press, 174.
- Fleetwood, S. (2007). Why work-life balance now? *International Journal of Human Resource Management* 18(3), 387–400.
- Freidli, L. (2009). *Mental health, resilience and inequalities*. Copenhagen: World Health Organisation Europe.
- Ganster, D.C. & Rosen, C.C. (2013). Work stress and employee health: A multidisciplinary review. *Journal of Management*, 39(5), 1085-1122.
- Gardiner, J., & Tomlinson, J. (2009). Organisational approaches to flexible working: Perspectives of equality and diversity managers in the UK. *Equal Opportunities International*, 28, 671–686.
- Green, F., Mostafa, T., Parent-Thirion, A., Vermeulen, G., Van Houten, G., Biletta, I., & Lyly-Yrjanainen, M. (2013). Is job quality becoming more unequal?. *Industrial & Labor Relations Review*, 66(4), 753-784.
- Grzywacz, J.G. Carlson, D.S. & Shulkin, S. (2008). Schedule flexibility and stress: Linking formal flexible arrangements and perceived flexibility to employee health. *Community, Work and Family*, 11(2), 199-214.
- Hämmig, O., & Bauer, G. F. (2013). Work, work–life conflict and health in an industrial work environment. *Occupational Medicine*, kqt127.
- Härmä M. (2006). Workhours in relation to work stress, recovery and health. *Scand J Work Environ Health*, 32(6, special issue), 502–514.
- Hayday S., Broughton, A., & Tyers, C. (2007). *Managing sickness absence in the Police Service: A review of current practices*. Report commissioned by the Health and Safety Executive and The Home Office, Institute of Employment Studies, RR582 Research Report.
- Henly, J. R., & Lambert, S. J. (2014). Unpredictable work timing in retail jobs. Implications for employee work–life conflict. *Industrial & Labor Relations Review*, 67(3), 986-1016.
- Hansen, J. and Stevens, R.G. (2012). Case–control study of shift-work and breast cancer risk in Danish nurses: impact of shift systems. *European journal of cancer*, 48(11), 1722-1729.
- Hofacker, D. & König, S. (2013) Flexibility and work-life conflict in times of crisis: A gender perspective, *International Journal of Sociology and Social Policy*, 33, 9-10, 613-635.
- Home Office (2007). *Flexible working in the Police Service*. London: Home Office.

- Idler, E. L., & Benyamini, Y. (1997). Self-rated health and mortality: a review of twenty-seven community studies. *Journal of Health and Social Behavior*, 21-37.
- Ingre, M., Åkerstedt, T., Ekstedt, M., & Kecklund, G. (2012). Periodic self-rostering in shift work: correspondence between objective work hours, work hour preferences (personal fit), and work schedule satisfaction. *Scand J Work Environ Health*, 38(4), 327-336.
- Johnson, T.P. and Wislar, J.S. (2012). Response rates and nonresponse errors in surveys. *Jama*, 307(17), 1805-1806.
- Kalleberg, A L., & Hewison, K. (2013). Precarious work and the challenge for Asia. *American Behavioral Scientist*, 57(3), 271-288.
- Kattenbach, R., Demerouti, E., & Nachreiner, F. (2010). Flexible working times: Effects on employees' exhaustion, work-nonwork conflict and job performance. *Career Development International*, 15(3), 279-295.
- Kohan, A., & O'Connor, B. P. (2002). Police officer job satisfaction in relation to mood, well-being, and alcohol consumption. *Journal of Psychology*, 136, 307-318.
- Lambert, S. (2008). Passing the buck: Labor flexibility practices that transfer risk onto hourly workers. *Human Relations*, 61(9), 1203–1277.
- Lee C and Owens RG (2002). *The psychology of men's health*. Buckingham: Open University Press.
- Love J, Grimby-Ekman A, Eklof M, Hagberg M, Dellve L. (2010). 'Pushing oneself too hard': performance-based self-esteem as a predictor of sickness presenteeism among young adult women and men – a cohort study. *J Occup Environ Med*. 52(6), 603–9.
- Loveday, B. (2015). Police management and workforce reform in a period of austerity. In *Police Services* (pp. 115-127). Springer International Publishing.
- McCann, D. (2007). Temporal autonomy and the protective individualization of working time law: The case of overtime work. *Labour & Industry* 7(3), 29–43.
- Ménard, K.S., & Arter, M.L. (2013). Police officer alcohol use and trauma symptoms: Associations with critical incidents, coping, and social stressors. *International Journal of Stress Management*, 20(1), 37.
- Nabe-Nielsen, K., Garde, A H., Aust, B., & Diderichsen, F. (2012). Increasing work-time influence: consequences for flexibility, variability, regularity, and predictability. *Ergonomics*, 55(4), 440-449.
- Netemeyer, R.G., Boles, J.S., & McMurrin, R. (1996). Development and validation of work-family conflict and family-work conflict scales. *Journal of Applied Psychology*, 81, 400-410.
- Nijp, H. H., Beckers, D. G., Geurts, S. A., Tucker, P., & Kompier, M. A. (2012). Systematic review on the association between employee worktime control and work-non-work balance, health and well-being, and job-related outcomes. *Scandinavian Journal of Work, Environment & Health*, 299-313.
- Otterbach, S. (2010). Mismatches between actual and preferred work time: Empirical evidence of hours constraints in 21 countries. *Journal of Consumer Policy*, 33, 143-161.
- Pallesen, S., Bjorvatn, B., Mageroy, N., Saksvik, I.B., Waage, S., & Moen, B.E. (2010). Measures to counteract the negative effects of night work. *Scandinavian Journal of Work, Environmental & Health*, 36(2), 109–120.
- Podsakoff, P.M., MacKenzie, S.B., Lee, J. and Podsakoff, N.P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5), 879–903.
- Preacher, K.J., and Hayes, A.F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediators models. *Behavior Research Methods*, 40(3), 879–891.

- Radcliffe, L.S., & Cassell, C. (2014). Flexible working, work–family conflict, and maternal gatekeeping: The daily experiences of dual- earner couples. *Journal of Occupational and Organizational Psychology*. Advance online publication. doi:10.1111/joop.12100
- Richbell, S., Brookes, M., Brewster, C., & Wood, G. (2011). Non-standard working time: an international and comparative analysis. *The International Journal of Human Resource Management*, 22(04), 945-962.
- Richardson, S., Shaffer, J. A., Falzon, L., Krupka, D., Davidson, K. W., & Edmondson, D. (2012). Meta-analysis of perceived stress and its association with incident coronary heart disease. *The American journal of cardiology*, 110(12), 1711-1716.
- Rubery, J., Ward, J., Grimshaw, D., & Beynon, H. (2005). Working time, industrial relations and the employment relationship. *Time and Society*, 14, 89–111.
- Russell, H., O’Connell, F.J., and McGinnity, F. (2009). The impact of Flexible Working Arrangements on work-life conflict and work pressure in Ireland. *Gender, Work and Organization*, 16(1), 73–97.
- Siemsen, E., Roth, A., and Oliveira, P. (2010). Common method bias in regression models with linear, quadratic, and interaction effects. *Organizational Research Methods*, 13(3), 456-476.
- Silvestri, M. (2006). ‘Doing time’: Becoming a police leader. *International Journal of Police Science and Management*, 8(4):266–281.
- Smith, L., Tanigawa, T., Takahashi, M., Mutou, K., Tachibana, N., Kage, Y., & Iso, H. (2005). Shiftwork locus of control, situational and behavioural effects on sleepiness and fatigue in shiftworkers. *Industrial health*, 43(1), 151-170.
- Smith, C.S. Folkard, S. Tucker, P. Evans, M.S. (2011). Work schedules, health and safety. In J.C. Quick and L.E. Tetrick (Eds.), *Handbook of occupational health psychology*, 2nd ed. Washington, DC: American Psychological Association.
- Smithson, J., & Stokoe, E. H. (2005). Discourses of work–life balance: Negotiating ‘genderblind’ terms in organizations. *Gender, Work, and Organisation*, 12(2), 147-168.
- Swanberg, J. E., Pitt-Catsouphes, M., & Drescher-Burke, K. (2005). A question of justice: Disparities in employees' access to flexible schedule arrangements. *Journal of Family Issues*, 26(6), 866–895.
- Tucker, P. & Folkard, S. (2012). *Working Time, Health and Safety: A Research Synthesis Paper*. International Labour Office, Geneva.
- Turnbull, P.J. & Wass, V. (2015). Normalizing extreme work in the Police Service? Austerity and the inspecting ranks. *Organization* 22.
- van Amelsvoort, L.G.P.M., Jansen, N.W.H., Swaen, G.M.H., van den Brandt, P.A., Kant, I.J. (2004). Direction of shift rotation among three-shift workers in relation to psychological health and work-family conflict. *Scandinavian Journal of Work, Environment & Health*. 30(2), 149-156.
- Vandello, J.A., Hettinger, V.E., Bosson, J.K., & Siddiqi, J. (2013). When equal isn't really equal: The masculine dilemma of seeking work flexibility. *Journal of Social Issues*, 69(2), 303-321.
- Van den Bergh, J., Beliën, J., De Bruecker, P., Demeulemeester, E., & De Boeck, L. (2013). Personnel scheduling: A literature review. *European Journal of Operational Research*, 226(3), 367-385.
- Van Buren, H.J., Greenwood, M., and Sheehan, C. (2011). Strategic human resource management and the decline of employee focus. *Human Resource Management Review*, 21(3), 209-219.
- van Veldhoven, M. J., & Beijer, S. E. (2012). Workload, work- to family conflict, and health: Gender differences and the influence of private life context. *Journal of Social Issues*, 68(4), 665-683.

WHO (2008). *PRIMA-EF guidance on the European framework for psychosocial risk management. A resource for employers and workers representatives*. In S. Leka and T. Cox (Eds.), *Protecting Workers' Health* series no. 9. Geneva: WHO.

Table 1. Means, standard deviations and intercorrelations

		No FWA		FWA		Sig	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		M	SD	M	SD																
1	Unpredictability (0-22)	11.21	4.06	12.25	4.22	<sup>b</sup>	<b>(.73)</b>	.00	-.03	.07	.02	-.06	-.04	.02	-.02	-.02	-.20	-.20	-.10	.06	-.01
2	Night work (0/1)	.69	.46	.42	.49	<sup>a</sup>	.00	---	.13	.10	.14	.00	.26	.20	.07	.14	-.24	-.19	.01	.06	.06
3	Weekend work (days/month)	3.99	1.24	3.63	1.45	<sup>a</sup>	.03	-.04	---	.15	.11	-.02	.11	.07	.05	-.09	-.09	-.02	.05	.09	.07
4	Work-life conflict (1-7)	5.08	1.41	5.17	1.46		.08	-.03	.14	<b>(.91)</b>	.42	.25	.29	.35	.30	.16	.20	.22	-.10	.21	.05
5	Perceived stress (1-5)	2.69	.76	2.83	.71	<sup>b</sup>	.04	.01	.09	.43	<b>(.70)</b>	.11	.38	.41	.45	.06	.02	.00	.03	.17	-.03
6	Alcohol consum (units/week)	7.92	9.35	8.74	9.60	<sup>c</sup>	-.01	-.07	-.03	.06	.04	---	.18	.08	.25	.10	.32	.33	-.20	.13	.00
7	Sleepiness (1-27)	13.87	3.99	13.86	4.16		.05	.04	.07	.37	.38	.06	---	.36	.20	.12	-.05	-.04	.03	.09	.07
8	Digestive probs (0-12)	5.57	2.85	5.61	2.76		.14	.05	.09	.37	.38	-.03	.32	---	.49	.14	.08	.06	.07	.09	.00
9	Cardiovascular probs (0-20)	2.97	3.60	3.56	3.89	<sup>c</sup>	.00	-.02	-.02	.28	.34	.13	.23	.38	---	.11	.17	.22	-.03	.15	-.02
10	Months on pattern	32.61	39.98	29.51	34.87		-.05	.14	-.06	.03	.03	.09	.08	.07	.11	---	.19	.17	-.18	.12	.11
11	Tenure (1-4)	2.23	1.14	2.67	1.12	<sup>a</sup>	-.23	-.12	-.06	.19	.08	.24	.09	.06	.23	.36	---	.77	-.19	.26	.02
12	Age	36.52	8.22	39.58	7.88	<sup>a</sup>	-.21	-.13	-.08	.16	.00	.23	.00	.03	.22	.28	.74	---	-.28	.31	.00
13	Female (0/1)	.28	.45	.26	.44		.04	-.02	.01	-.02	.05	-.15	.09	.11	-.02	-.14	-.21	-.23	---	-.17	-.07
14	Dependents (0/1)	.53	.50	.65	.48	<sup>a</sup>	-.11	.00	.02	.15	.08	.06	.04	.07	.08	.14	.34	.43	-.27	---	.20
15	Married/cohab (0/1)	.76	.43	.82	.39	<sup>c</sup>	-.05	.00	-.01	.10	-.10	.01	-.08	-.05	-.03	.04	.14	.13	-.14	.18	---

Notes. Correlations below diagonal for FWA group (N=913); above diagonal non-FWA group (N=256). All values .05 or more significant at p<.05. Cronbach alpha reliability coefficients in diagonal/parentheses

<sup>a</sup> p<.001 <sup>b</sup> p<.01 <sup>c</sup> p<.05



Table 2. Hierarchical regression results for prediction of work-life conflict and perceived stress

	Work-life conflict		Perceived stress	
	<i>Step1</i>	<i>Step2</i>	<i>Step1</i>	<i>Step2</i>
Months on pattern	-.03	-.03	-.01	-.01
Tenure	.15**	.17***	.16***	.17***
Age	.05	.07	-.13**	-.12**
Female	.03	.04	.07*	.07*
Married/cohabiting	.05	.05	-.10***	-.10***
Dependents	.11**	.09**	.15***	.15***
Night work	.03	.04	.03	.03
Weekend work	.15***	.15***	.09**	.09**
Unpredictability		.13***		.06***
$\Delta R^2$		.02		.01
$R^2$	.08	.11	.05	.05
F change		22.55***		4.62*

*Note.* N = 1200. Standardized coefficients

\*\*\* p<.001 \*\* p<.01 \*p<.05

Table 3. Summary of results for multiple mediation models

	Effect	Boot SE	95% bias corrected CI	
			LLCI	ULCI
<i>DV: Alcohol consumption (N=1194)</i>				
Direct effect of unpredictability	0.07	0.07	-0.06	0.20
Via WLC	0.02	0.01	-0.05	0.04
Via stress	0.01	0.01	-0.001	0.03
<i>DV: Sleepiness (N=1207)</i>				
Direct effect of unpredictability	-0.01	0.03	-0.06	0.05
Via WLC	0.03	0.01	0.02	0.05
Via stress	0.02	0.01	0.001	0.03
<i>DV: Digestive problems (N=1203)</i>				
Direct effect of unpredictability	0.07	0.02	0.03	0.10
Via WLC	0.02	0.01	0.01	0.03
Via stress	0.01	0.01	0.001	0.02
<i>DV: Cardiovascular problems (N=1199)</i>				
Direct effect of unpredictability	0.02	0.03	-0.03	0.07
Via WLC	0.01	0.01	0.01	0.03
Via stress	0.02	0.01	0.00	0.03

*Note.* All analyses based on 5000 bootstrap samples. WLC ‘work-life conflict’

Table 4. Conditional indirect effects of unpredictability

Outcomes	Mediator	Moderator level		Conditional indirect effect	SE	95% bias corrected CI		
		Alcohol Consum.	FWA			LLCI	ULCI	
<i>DV: Sleepiness (N=1193)</i>								
	Work-life conflict	Low	No	.02	.01	.002	.05	
		Low	Yes	.01	.02	-.02	.05	
		Mean	No	.03	.01	.02	.05	
		Mean	Yes	.02	.02	-.003	.06	
		High	No	.04	.01	.02	.07	
		High	Yes	.03	.02	.006	.07	
		Stress	Low	No	-.01	.01	-.03	.01
			Low	Yes	-.02	.01	.04	.01
			Mean	No	.01	.01	-.001	.03
			Mean	Yes	.004	.01	.02	.07
			High	No	.04	.02	.02	.07
			High	Yes	.03	.02	-.01	.07
<i>DV: Digestive problems (N=1190)</i>								
	Work-life conflict	Low	No	.02	.01	.002	.03	
		Low	Yes	.01	.01	-.01	.03	
		Mean	No	.02	.01	.01	.04	
		Mean	Yes	.02	.01	-.001	.04	
		High	No	.03	.01	.02	.05	
		High	Yes	.03	.01	.01	.05	
		Stress	Low	No	-.01	.01	-.02	.01
			Low	Yes	-.01	.01	-.04	.01
			Mean	No	.01	.01	-.02	.02
			Mean	Yes	.003	.01	-.02	.02
			High	No	.03	.01	.01	.05
			High	Yes	.02	.01	-.01	.05
<i>DV: Cardiovascular problems (N=1185)</i>								
	Work-life conflict	Low	No	.01	.01	-.001	.02	
		Low	Yes	.003	.01	-.003	.02	
		Mean	No	.02	.01	.01	.03	
		Mean	Yes	.01	.01	-.001	.03	
		High	No	.03	.01	.01	.06	
		High	Yes	.03	.01	.01	.06	
		Stress	Low	No	-.01	.01	-.03	.02
			Low	Yes	-.02	.02	-.05	.01
			Mean	No	.02	.01	-.003	.04
			Mean	Yes	.004	.02	-.03	.04
			High	No	.04	.02	.02	.07
			High	Yes	.03	.02	-.01	.07

Note. High/low conditions of AC represent one standard deviation above/below the mean. All analyses based on 5000 bootstrap samples.

## **Figure captions**

Figure 1. Research model

Figure 2. Moderating effect of alcohol consumption (AC) on the relationship between unpredictability and work-life conflict (employees not working FWAs)

Figure 3. Moderating effect of alcohol consumption (AC) on the relationship between unpredictability and perceived stress

Figure 1. Research model

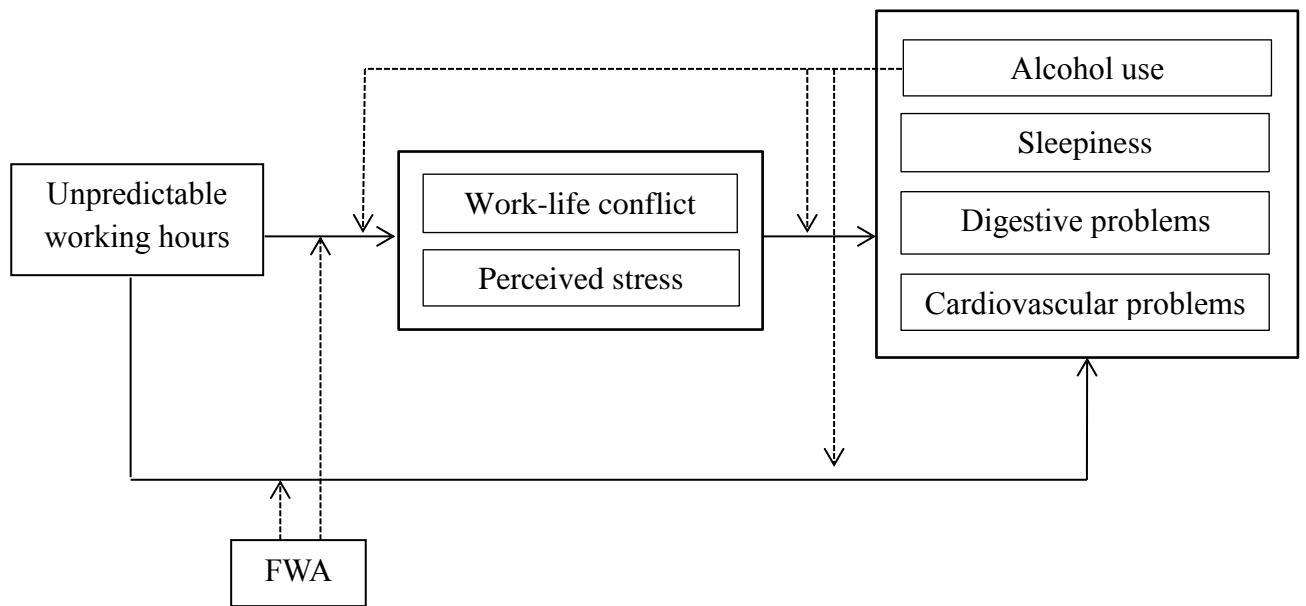


Figure 2. Moderating effect of alcohol consumption (AC) on the relationship between unpredictability and work-life conflict (employees not working FWAs)

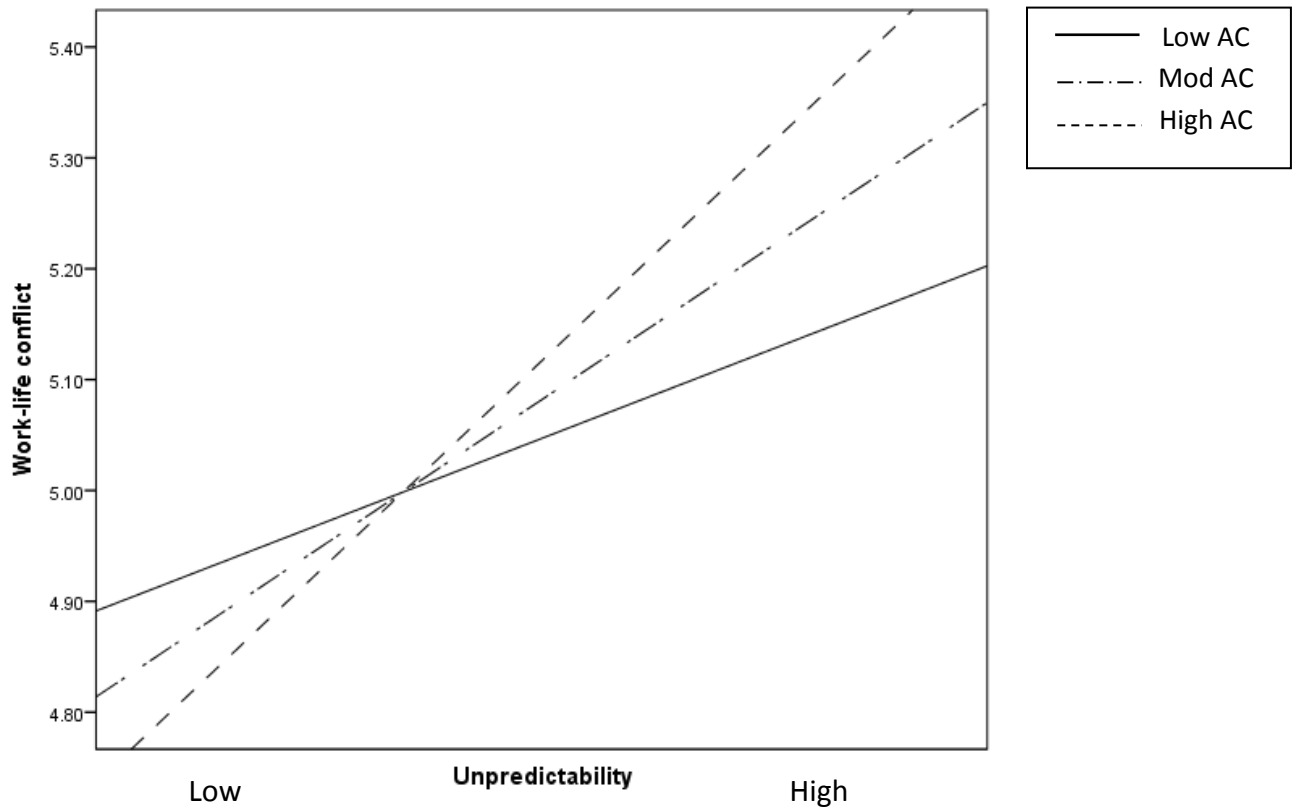


Figure 3. Moderating effect of alcohol consumption (AC) on the relationship between unpredictability and perceived stress

