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The role of relational meaning in work-related wellbeing: A longitudinal qualitative study of employees' framing of demands and resources

Abstract

Little research examines the psychological processes that lead to heterogenous and unfolding appraisals of, and responses to, a change. This study examines the accounts and experiences that employees from a one UK Fire and Rescue Service give in response to a significant change to their work schedules. We used a longitudinal interview study with three data collection points to identify heterogeneity (both over time and between participants) in perceptions of change-related demands, resources and outcomes. Our findings showed that heterogeneity in employees' accounts of their experiences is linked to the role of relative meaning in the framing of demands and resources. We propose a conceptual model as an extension to the Job Demands-Resources model to explain the process through which employees evaluate their work conditions as either demanding or resourceful.

Key Words:

Introduction

The effects of workplace stress on employee health and both individual and organisational performance are well established (e.g. Cox et al., 2006; Dewe et al., 2010, 2012; Gilboa et al., 2008; Nixon et al., 2011). Viewed from a psychological perspective work stress is a dynamic transactional relationship between the individual and their environment (Jovanovic et al., 2006). Whilst individually laudable, no single theory or model of work-related stress provides a holistic understanding of the experience of work conditions on stress/strain or positive psychological work outcomes.

Resource-based models of work stress can be used to make some predictions about how workers will tend to respond to change. Hobfoll (1989, 2011) proposes individuals are motivated to protect the physical and psychological resources available to them, and that individuals employ these resources to navigate, organise and fit within the context of the organisation. Resources include *"object resources (e.g. tools for work, car), condition resources (e.g. supportive work relationships, seniority at work), personal resources (e.g. key skills and personal traits such as self-efficacy and self-esteem) and energy resources (e.g. knowledge, credit)"* (Hobfoll, 2011, pp. 117). Environmental conditions within the organisation either support, foster, enrich and protect resources for workers, or detract, undermine, obstruct or impoverish employees' resource reservoirs. This organisational ecology creates, or fails to create, passageways to provide and protect resources. Employees' appraisals of their success in obtaining and protecting resources is central to the amount of stress they experience. Resource loss is more salient than resource gain and therefore will have a greater impact than similarly valued gains (Hobfoll, 2011).

Resource-based models can be used to explain why organisational stressors associated with change may fail to illicit a negative outcome, and why workers use proactive job behaviours in order to gain resources (Halbesleben et al., 2014; Hobfall, 2011). The Job Demands-Resources Model (JD-R) (Bakker and Demerouti, 2007, 2016) develops upon Hobfoll, focussing on the dual process of negative strain and impairment, and positive motivation and commitment (Bakker and Demerouti, 2016, 2007; Schaufeli and Taris, 2014). Job demands (e.g. work overload, emotional labour or organisational demands) can deplete individuals' psychological and physical resources leading to health impairment. Job resources (e.g. social support, physical resources or promotional prospects) can increase the levels of motivation at work leading to greater work engagement and positive health outcomes. The JD-R proposes

that resources have motivational potential that can either foster individual growth or are instrumental in achieving work goals leading to decreased cynicism, high work performance and increased work engagement, potentially mobilising individuals to seek out activities to protect those resources or gain new ones (Bakker and Demerouti, 2016). An individual's experience of work-related strain is in response to the degree of imbalance between their work demands and resources (Bakker and Demerouti, 2007, 2016). When using the JD-R model, investigation of work-related wellbeing should be tailored to reflect the demands and resources available to workers in their specific situation (Bakker and Demerouti, 2016). Thus, the relevant demands and resources may differ from one worker to another (inter-individual variability) and over time (intra-individual variability).

Personal resources highlight how characteristics and aspects of self are associated with the ability to deal with demands. Schaufeli and Taris, (2014) argue that personal resources are important in various elements of the JD-R model (e.g. by impacting on resilience and control, the buffering of the effects of work on well-being and through their direct impact on wellbeing). The most recent version of the JD-R sees a direct relationship between personal resources and job resources, which together moderate the relationship between job demands and strain (Bakker and Demerouti, 2016). Importantly individual differences can also influence the perception of work characteristics (Schaufeli and Taris, 2014).

The framing of demands is influential to wellbeing outcomes. A demand framed by an individual as a challenge offers the opportunity for growth and future gain relating positively to engagement. A demand framed as a hindrance obstructs growth and goal attainment, thus lowering engagement (Schaufeli and Taris, 2014). In the same way, there can be individual differences in perceptions of what constitutes a resource, and thus individual differences in what workers are motivated to protect in order to minimise their stress response. In summary, resource models offer some basic explanations for individual differences in stress responses when workers are faced with the same events and circumstances. However, the JD-R is primarily focused at the group level and, currently, research directly examining the ways in which work conditions become framed as demands or resources is limited. The dynamic nature of employee appraisals of demands, control and support identified by Daniels et al. (2008) and the positive gain/negative loss spirals within the JD-R (Bakker and Demerouti, 2016) also highlight a need for temporal studies to understand sense-making variability between- and within-workers.

Transactional theories of work stress describe the effects of perceived imbalance between demands and ability to cope on employees' cognitive and emotional appraisals of their situation (Lazarus and Folkman, 1984). The primary appraisal is where an individual attaches personal meaning to the event and assesses any potential impact on normal functioning (Dewe et al., 2010). The resulting stress state is a product of the internal representation of problematic transactions. In subsequent secondary appraisals the individual evaluates their ability to cope. A worker's continual monitoring of their transactions with their environment (such as demands, abilities, constraints, and support), hypothetically asking "is this stressful?" and "can I cope?" leads to the eventual stress response. The environment, the individual and their psychological responses have a mutual effect on one another shaped by experience and previously acquired knowledge (Anisman, 2014). An ongoing and unfolding process is then established whereby appraisals of the outcomes of coping (tertiary appraisal) feedback into the appraisal of the work environment and coping resources.

Meaning-making may be important to these appraisal processes and can help explain the framing of demands and resources lacking in the JD-R model. For example, demands can be appraised as either a challenge or a hindrance differently by different individuals, and even as

both by the same individual at different points in time (Gerich, 2016; Webster et al., 2011). Perceptions of the organisational context, such as perceptions of job security, financial gratification and sense of coherence attributed to the work, have been shown to be related to whether work tasks are appraised as challenge or hindrance demands (Gerich 2016). Relational meaning (Lazarus, 1999) can be applied to examine how and why there are variations between individuals and within individuals over time: in other words, how and why individuals' uniqueness determines variations in their responses to the same event or situation. Relational meaning implies that individuals' circumstances and experience, both prior and immediate, are evaluated to determine the significance of current events, interconnecting the implications of the situation on personal wellbeing. Smith and Lazurus (2001) argue that this interconnection between circumstance and experience is a crucial factor in determining the individual's emotional response. Lazarus (1999) offers relational meaning as an explanation of why actors within seemingly homogenous groups appraise stressors differently because of the influence of individual differences and heterogeneous experiences.

Methods for examining work stress often focus upon a predetermined set of criteria and structured reality (such as self-report questionnaires) (Dewe et al., 2010). These fail to capture data on relational meaning. For example, reports of high workload do not capture heterogeneity of relational meaning since some participants may be reporting challenges (positive appraisals) while others are reporting hindrances (negative appraisals) (Searle and Auton, 2015). Meaning-making relates to the extent individuals use value-based reflection to incorporate challenging or ambiguous events within a personal framework for understanding the situation (Park, 2010); however, the processes underlying these variations in appraisals is not clear. Understanding the ways workers experience stress may be a promising avenue for exploring the reasons behind heterogeneous responses to work (Lazarus and Cohen-Charash, 2001).

One criticism of transactional models of stress is the implication that conscious thought and introspection dominate the appraisal process (Marks et al., 2015). However, coping choices may be maladaptive with regard to long term impact of the event (Mark and Smith, 2008). Denial (the refusal to acknowledge that there might be an environmental threat), in particular, can only work as a defence against stress if an individual is unaware they are using this strategy. Yet, awareness does not necessarily equate to rationality: some individuals display coping styles they know to be ineffective (Anisman, 2014; Mark and Smith, 2008). Intuition, rather than conscious appraisal, can guide decision making and behaviour through the use of heuristic short cuts created out of experience (i.e. the relational meaning attached prior to the event) (Dane et al., 2012). Ecologically driven methods of data collection are needed to capture these complex and dynamic choices about coping process as these are likely to have conscious and intuitive elements (Dewe et al., 2012; Lazarus, 1999)

Similarly, to understand the intra-individual processes involved in the primary appraisal of working conditions requires ideographic analysis with methods that are different to those that identify the common or average impact of environmental stressors (Dewe et al., 2012). Rich idiographic accounts of appraisal processes can provide a basis for fuller understanding of responses to change by elucidating what may work for whom, under what circumstances and at what point in time (Nielsen and Miraglia, 2017). We argue that using an idiographic method that examine both meaning-making and appraisal processes allows for an understanding of intra- and inter-individual differences in responses to change.

The present study
We carried out this study in an organisation undergoing significant organisational change. The UK Fire and Rescue Services (FRS) face challenging decisions regarding service

delivery due to a responsibility to manage public expectations alongside recent changes in central funding. At the inception of the project, a reduction in operational demand and the changing nature of firefighters' work (an increased focus on prevention) saw alternative shift patterns suggested as a way of controlling operational costs (Knight, 2013). This study explores the introduction of Alternative Crewing Arrangements (ACA) into one UK FRS.

The particular ACA introduced requires personnel to 'live-in' the fire station with periods of up to five days away from home but needs half the personnel of a typical full-time shift pattern. Within the organisation, the differential working conditions of ACA when compared to the standard crewing model (two dayshifts, two nightshifts and four days off, known colloquially as 2:2:4) include:

- 24-hour shifts split into 12 positive hours and 12 negative hours. *Positive hours* are used for active work and *negative hours* are for rest and recuperation. Crew members must remain on-call for emergencies at all times when on shift,

- self-rostering, allowing crew to pick up to five blocks of 24 hours in one batch,

- private accommodation provided for negative hours in contrast to shared dormitories,

- top heavy junior management structure with two watch managers and two crew managers compared to one of each on a standard single appliance fire station,

- 27% enhancement of basic salary for being on-call during negative hours, which is included within pension contributions,

- the allowance of family members on station during negative hours as part of a family-friendly policy,

- devolving of station duties down to firefighters, where previously these tasks were the responsibility of the Junior Officers.

The influence of frequently occurring minor work stressors can have a more detrimental cumulative effect on emergency workers' wellbeing than operational incidents, for which they are trained and supported by the organisation (Brough, 2005; Houdmont, 2013). Firefighters switch quickly between emergency response roles, preventative work engaging with the public, and administrative roles ensuring the efficient running of the fire station. Within ACA the periods of exposure to these working practices are extended with a reduced capacity for recovery.

Widely reported sources of work-related stress for UK firefighters are "reduction in force, manpower, wages, and or benefits" (Malek et al., 2010, pp58). The ACA system halves the number of personnel required per station, with potential implications for demands and resources (such as job security). Firefighters report sleep disturbance as a common source of stress (Malek et al., 2010) with consequences for wellbeing and performance (Caputo et al., 2015; Takeyama et al. 2005). ACA has increased potential for disturbed sleep and poorer recovery during the time when firefighters are on station and available for emergency calls.

Organisational resources including a strong culture of social support and teamwork (Hall et al., 2007) are argued to buffer against the demanding aspects of the firefighter role and foster work engagement (Bernabé and Botia, 2016). The newness and uncertainty surrounding the implementation of ACA has the potential to disrupt norms and values. Shift working and intense operational requirements, often mean firefighters see more of their colleagues than their own family, and form strong bonds and camaraderie (Andrews and Ashworth, 2017) and emotional support through rituals and humour (Young et al., 2014). Firefighters self-report as having a high degree of confidence in solving problems and low levels of

helplessness (Baker and Williams, 2001), potentially through the high levels of training and the nature of the work they perform. The immersive working conditions of ACA may provide firefighters with more opportunities to engage in practices that enhance social support and problem-focused coping,

The change process of moving employees from a well-established way of working to a structurally different system with new norms and processes provides a unique opportunity explore perceptions of demands and resources over time. More importantly it allows the unfolding impact of these changes to be studied among those who may have diverse and developing responses to those changes.

Method
We conducted a longitudinal qualitative interview-based study at four fire stations over three time points; pre-changeover to ACA, during the implementation phase, and 12 months post-changeover to ACA.

Participants
A population of 64 participants were eligible to take part in the study at each time point. There was an overall response rate of 50% at Time 1, 69% at Time 2 and 53% at Time 3 (see Table 1). The time served as an operational firefighter at the first data collection point ranged from 5 to 31 years (mean 21.16yrs SD 7.87). Other demographic information relevant to the research questions is included in the analysis but in ways that protect participant anonymity.

Table 1. Sample and Response Rates

		Nº participants at Time 1	Nº participants Time 2	Nº participants Time 3
Station A	Watch Manager	n/a	2	2
	Crew Manager	n/a	2	2
	Firefighter	n/a	10	10
	Response Rate	n/a	87%	87%
Station B	Watch Manager	2	2	2
	Crew Manager	1	2	2
	Firefighter	3	7	4
	Response Rate	37%	68%	50%
Station C	Watch Manager	2	2	2
	Crew Manager	2	2	2
	Firefighter	7	6	4
	Response Rate	68%	62%	50%
Station D	Watch Manager	n/a	1	2
	Crew Manager	n/a	2	1
	Firefighter	n/a	6	1
	Response Rate	n/a	56%	25%

Data collection
Participation in the study was voluntary. Informed consent was obtained before each interview. Three interviewers (KM, RR, NB) were involved in conducting the interviews. These were face-to-face at their place of work during standard operational hours.

The duration of the interviews was on average 35 minutes (range 16 to 68 minutes).

Interview Schedule
We used a semi-structured interview technique. Questions at Time 1 focused on areas of work wellbeing and performance identified as of interest by stakeholders within the FRS. We refined these at Time 2 and Time 3 following engagement with the literature related to topics discussed by participants. Although interview schedules were modified at each data collection period, common to each interview schedule were questions focused around (1)

participants' perceptions of demands at work, (2) ability to control workload, (3) relationships with colleagues, and (4) work-nonwork interface. This set of questions was designed to allow analysis of participants' responses over time as unfolding experiences of the change process. When participants spoke in general terms about ACA they were prompted to give specific examples.

Analysis of Interview Data
We followed the steps of Braun and Clarke's (2006) inductive thematic analysis to analyse the Time 1 data. We then used these initial themes to form a template to code the Time 2 and Time 3 interview data, in accordance with King's (2012) framework for template analysis.

Using NVivo software, KM coded extracts of data relevant to the research question. Once coding was complete, those codes we considered to access similar aspects of the data were combined to form overarching themes. Initial themes were refined using a two-step process (Braun and Clarke, 2006). First KM read the collated codes for each theme to ensure good fit, and any codes that did not fit the theme were discarded. Second KM, RR and NB considered themes in relation to the entire data set to ensure accurate representation of the data set as a whole. At this point, we noticed links to the literature were developing and the Job Demands-Resources Model (JD-R) (Demerouti and Bakker, 2007, 2016) was then used to inform the identification of thematic clusters.

The large data set for this project necessitated a parsimonious approach to data analysis. Template Analysis (King, 2012) allows for the analysis of larger data sets with a pre-defined set of codes, which we refined during analysis to allow for the best fit with the data. Template Analysis has a flexible approach to fit with the project aims but balances this with the relatively high degree of structure made possible by the resonance of the data with elements of existing theory (King, 2012). The use of thematic and template analysis together across data from different time-periods provides synchronisation as they are complementary. The inductive nature of the thematic analysis at Time 1 allows the findings to be data driven with key themes identified coming direct from participants. We expected many of these themes to carry over in to Time 2 and 3, therefore template analysis allows for the exploration of the large set data over these time frames but with the flexibility to adapt and add to themes as new findings are generated. Template analysis allows the use of lateral themes, also called integrative themes. These permeate across other thematic clusters and have prominence within the data highlighting the need for distinct theme, rather than being placed as sub-themes.

A priori themes were identified from the time 1 data analysis and were relevant to the overall research question (Crabtree and Miller, 1999). We saw these as flexible and 'open to modification' as coding progressed through template analysis (King 2012). The final coding template can be found in appendix 1 (supplementary figure). Within NVivo, we deconstructed each interview transcript into meaningful segments of text that conveyed clear meaning associated with the experience of working the ACA shift system. We then clustered together segments of text with similar meaning from different participants. These clusters were then transferred onto paper to allow us to make sense of the clusters and arrange into the a priori themes from the template. Any sections of text which failed to fit into the template were inductively analysed as part of a refinement of the coding framework. Final themes were checked by all three researchers responsible for conducting the interviews to check for appropriate representation of the data.

Findings
The interviews revealed that participants had a diverse range of experiences of, and responses to, the implementation of ACA. There were three main over-arching themes (themes 1-3

outlined in table 2). Demands and resources were both tangible (e.g. tools and equipment, number of call-outs) and psychological (e.g. perceptions of control over work tasks and work schedules, support from managers and colleagues, demands to do more or different tasks or to work with new colleagues). The three main themes appeared interlinked as participants appraised the stressors and their personal coping resources, and the idiosyncratic costs and benefits of ACA, to arrive at a consideration of the new arrangements. Across these three main themes, two lateral themes weave through participants talk as they discuss the motivators, demands and resources within the new shift system (themes A and B in table 2).

Table 2. Theme Descriptions

MAIN THEME	THEME DESCRIPTION
1. DRIVERS OF CHANGE	Included individual participants' reasons for wanting to change to ACA and their perceptions of the reasons for the change being implemented by the service. The individual motivations included; the long-term financial security afforded by the pension uplift; to remain at a station at which the participant was already attached; short term financial gain; and reduction in commuting. Participants held diverse views of the drivers behind the ACA (section 1.2) ranging from political motives by senior management/combined fire authority to pragmatic discussions around the services need to balance lower call volumes and budgetary constraints. There was an acknowledgement by participants that the operational demands/workload of the station played a part in the decision to change to the new shift system.
2. DEMANDS FROM ACA	Includes participants' views about the expectation and perception of demands. Additional or different demands on themselves, their colleagues and their families, were wide-ranging (see Section 2 of template). The perception of demands changed over time for some participants as they navigated ACA. The most salient demands within the data were those surrounding work-family conflict, with many indicating the extra pressures placed upon their partners, and the time-demands created by the recouping of negative hours within the work day compressing the time available to carry out the same number of tasks.
3. RESOURCES FROM ACA	Includes participants' views regarding expectation and perception of resources being available to them, their colleagues and their families with the introduction of ACA (section 3 of template). Some of these were a continuation of resources available on the old system but were seen as important when dealing with the new and different demands of ACA such as supportive relationships with colleagues and family. Others were unique to ACA, such as having greater control over when and how participants worked allowing for job crafting behaviours.
INTEGRATIVE THEME	
A. PERSONAL CONDITIONS	Personal conditions are framed within the analysis as relatively stable components of an individual's life, which in, and of, their own have no specific demanding or resourceful quality. Within the lateral theme includes factors such as family status, career stage, home location.
B. PERSONAL AFFECT	Included the demonstration of a particular emotion or feeling towards the move to ACA. These were both positive (such as hopefulness, optimism, joy) and negative (such as sadness, anger, despondent). Sometimes these were explicit in participants' talk where they use words associated with emotion such as "frustration" "grumpy", "love", other times the emotion was evident from the description of examples and the undercurrent of the talk. The affective states highlighted within the data are indicated in section B of the template.

Using the themes and coding template outlined above, we have designed a conceptual model to show the relationship between the themes and make sense of participants' experience of working ACA. This conceptual model is built of four components, each providing a contribution to the work wellbeing literature as well as an understanding of how working ACA impacts upon employees. We present the findings in line with the model, broken in to four component parts, delineating a contribution to the understanding of work-related wellbeing and the dynamic process through which individuals frame demands and resources.

Job conditions influence demands and resources

The findings support the core concept within the JD-R model showing that certain job conditions are perceived as providing demands by some or resources by others. The job conditions participants spoke of were both core activities within their roles as well as unique and specific aspects of ACA. The conceptual representation in Figure 1 highlights the job conditions identified by participants as creating either a demand or resource for them both within and outside of work.
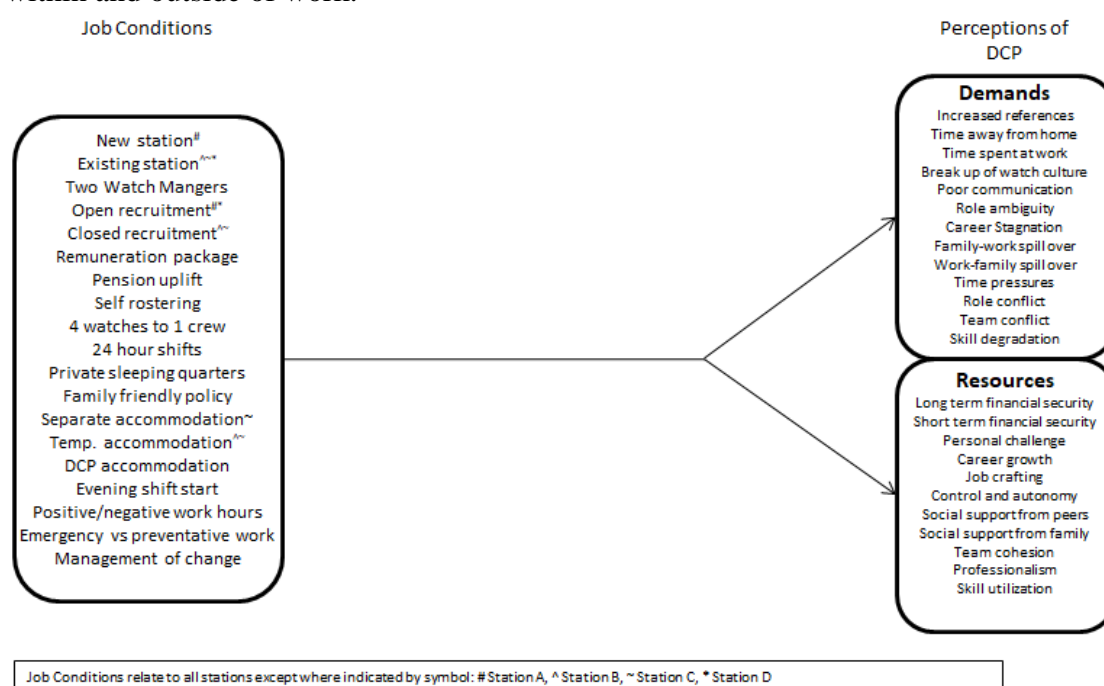

Figure 1. Conceptual representation of ACA job conditions and perceptions of working ACA

Demands were focussed around task and psychosocial demands. Task demands included increased references (areas of responsibility with associated tasks such as community fire safety, water management, or trauma training) following the reduction in personnel on each station and the devolving on officer tasks associated with ACA.down to firefighters. Psychosocial demands were focused on relationships with both firefighters and their families, and also with colleagues across the service. Certain demands were common across all stations, including the time spent away from home creating a spill-over in demands at home and the negative hours component of the ACA increasing the intensity of work tasks. Team conflict with other parts of the FRS was perceived by many as a lack of understanding from those outside of ACA as to why certain policies and procedures are in place, which was still felt by some to be unresolved at Time 3. One example was the need to protect recovery time in the mornings following night time calls or ACA crews not being used as relief/stand-by cover during negative hours. The self-rostering component for ACA was in the main seen as being an organisational resource, providing some control over when they worked. However, it was also seen as creating extra demands within the workplace. Specific training sessions, in

particular, needed to be repeated to ensure competency across the crew, reducing the efficiency of scheduled core training activities.

> *"We went through the SOPs [Standard Operating Procedures] the other day and [FF] had done it twice and we were doing it again because two people out of the four hadn't done it. Whereas that wouldn't have happened before, you would have got most bar one on that first hit …and unfortunately we are going to have to duplicate everything."* ***(FF, Station B, Time 2)***

Some differences in the perception of aspects of ACA as demands or resources were linked to differences in the conditions between stations. For example, Station A was a new station and all crew volunteered into the system. In the other three existing stations some crew felt they were forced onto ACA thus had a lack of control. In addition, the separate accommodation block provided at Station C created a longer distance to travel during negative hours call outs, creating an additional time demand in responding to emergencies.

> *"With calls we are taking longer to turn out as well because we have got to come in from there into here, get the tip sheet and then run round, and during the day we have got to go round the outside."* ***(CM, Station C, Time 2)***

Elements of role ambiguity were linked to having two different first-line managers (junior officers) within the ACA. Some reported not knowing what was expected of them due to different junior officers being in charge and Junior officers reported experiencing blurred boundaries regarding who had overall responsibility for and control over day-to-day decisions. Nuances in interpretation of policies and procedures, and differences in expectations of crew members at incidents sometimes created conflict between first-line managers.

> *"for a long time now I have been doing things the way I think is the correct way to do it and now all of a sudden it's like "why has this happened". "Because that's the way I've always done it", "but that's not the way I do it" and so there has been a little bit of locking of horns."* ***(Junior Officer, Station D, Time 2)***

Similar to the perception of demands, physical, emotional, and cognitive resources were identified (e.g. physical environment, skill utilisation, social support, job crafting). The physical environment was seen as providing suitable resources to rest and recuperate during negative hours. Having strong, personally important, positive motivations for moving on to ACA system were seen as being resources for coping with the extra demands of the ACA. For some, the long-term financial security created by the remuneration package was an important psychological resource.

ACA was seen to bring about greater levels of control in the work environment, most salient in those at the Junior Officer level. The responsibility of all references moving to one crew created a greater sense of ownership, and a reduction in the perception of shifting accountability of tasks to others. With references being devolved to firefighter level, a feeling of ownership filtered down through the crew, with firefighters highlighting that they used quiet periods on station to catch up on designated work without explicit direction from their Junior Officer.

At the firefighter-level discussions around control were more implicit than explicit. Many indicated that they have little control at their rank and were directed by their junior officers. *"Control? Nah, I just do what the gaffer tells me."* **(FF, Station B, Time 2).** However, the examples they gave of their work often contained evidence of (task, cognitive and relational job crafting behaviours. Participants spoke about being able to schedule when and how they worked on their areas of responsibility. There was the perception of having more time to

spend on tasks due to being at the station for longer periods of time and having greater continuity. Due to the amount of unbroken time they were available for emergency incidents, participants had the perception of attending more, and a greater variety of, calls, cognitively relating to their identity as a firefighter. Participants' talk around the increase in attendance suggests this was not perceived as an increase in demand; it was seen as being able to utilise their training and skills. One participant spoke of ACA *"reigniting their love for the job"* **(CM, Station C, Time 2)** through the perception of attending more incidents. The ability to choose their shifts, and hence their colleagues, was perceived to better serve their personal relationships. The day-to-day working of ACA allowed participants to choose how much they interacted with colleagues, through shift selection and having a personal space to retreat.

Personal conditions influence the perception of job conditions

Personal contextual factors shaped perceptions of job conditions as either a demand or a resource (Figure 2). Aspects considered resources within the JD-R model have been framed as demands in some participants, and vice versa, indicating a permeable boundary between demands and resources. Personal contextual factors salient for the participants were life stage, career stage, home location and nonwork commitments. As indicated in the overview of the themes (table 2), personal conditions are not inherently demanding or resourceful but are relatively stable aspects of self and personal life that influence the perceptions and experiences of demands and resources.
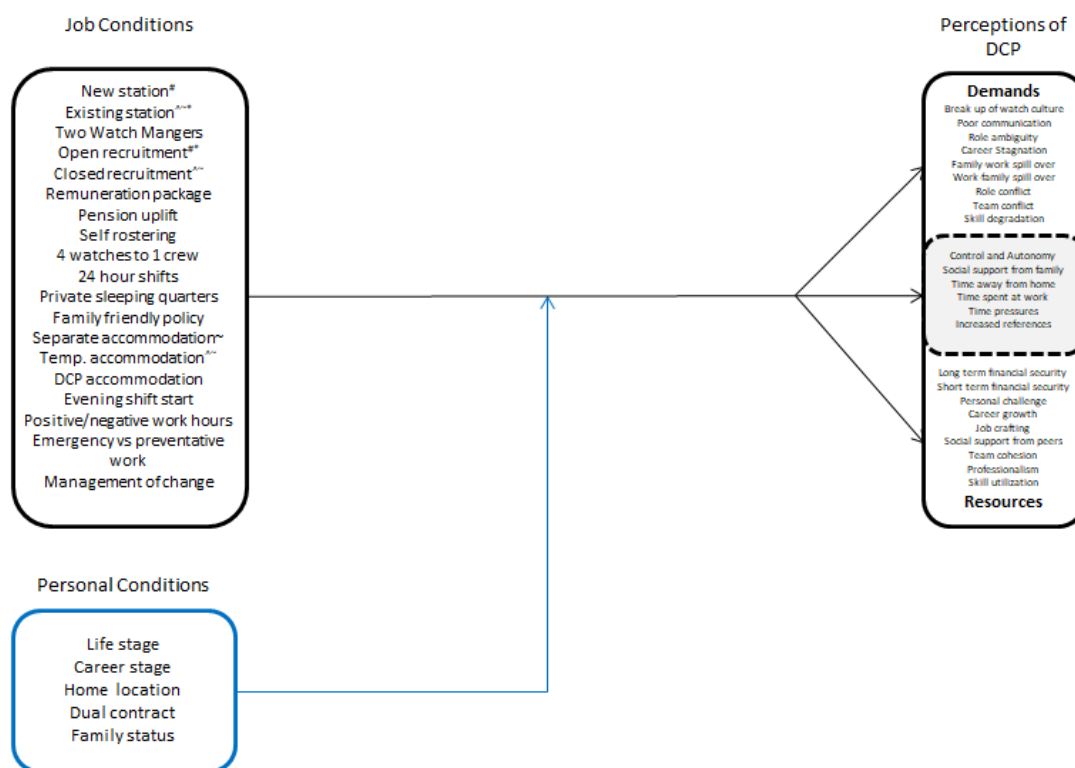
Figure 2. Conceptual representation of the influence of Personal Conditions on perceptions of working ACA

Job conditions, related to top-down implementation of change, might reasonably be expected to have a homogenous influence on some demands and resources. For example, the reduction of personnel leading to the task demand of increased references. However personal contextual conditions influenced whether these were seen as challenge demands or hindrance demands. Career stage seemed particularly influential in the perception of challenge, with

those nearing the end of their career more likely to talk in terms of seeing ACA as an opportunity for growth rather than a difficulty. Conditions often framed as hindrances (e.g. role ambiguity or poor communication from management) were framed as opportunities to craft their own roles or to carry out research into how ACA might be best implemented by some participants.

Job conditions with the potential to provide a resource to employees were sometimes found to be more of a demand. The family friendly facilities, where employees can bring their families on to station during the evenings and overnight, were provided as way of maintaining family support. However, personal contextual conditions such as the age of any dependent children influenced whether participants saw these facilities as a resource allowing valuable family time, or a demand due to the perceived inappropriateness of the timings for school-age children. Those with young families were more likely to perceive this facility as a demand due to the restricted (late) visiting hours, and the potential for disruption to family routine. Career stage also influenced how this policy was received: junior officers indicated it created extra demands for them managing other people's families within the work environment as well as a conflict of identity when their own families came to the station.

> *"all of a sudden I'm a dad and a husband and manager and it's all in the same mix and it puts my head in to a bit of a spin." (WM, Station D, Time 2)*

Autonomy over workload is often considered a resource. However, one participant at firefighter rank early in his career with no dependents described how he struggled to make use of the freedom of being able to choose his own shifts and work on his reference (an additional cognitive demand), preferring to be directed by a line manager.

Combination of personal and job conditions produces a cognitive and affective response
Personal contextual conditions appeared to provide participants with an idiosyncratic view of the job conditions presented by ACA. Their individual experience of life through personal relationships, career, personal interests, where and how they live, provided a perspective for which to appraise and relate to their experience of working ACA. This relational meaning was accompanied by an affective component, both of which framed the perception of job conditions. By attributing a relational meaning to the situation, participants display individual differences in perception to the same event or situation (Figure 3).

Relational meaning and appraisal are most evident when participants spoke of the impact on work-life balance. Participants would evaluate their own personal context and appraise the situation accordingly. For employees with young families, the family friendly facilities available to them were often seen as impractical and a demand that drew on their cognitive and emotional resources. Those with older or no children saw this as an opportunity to spend valuable time with their spouse (an emotional resource).

> *"This was sold to us as a family friendly package because your partners and family could come onto station at night. I think that was a complete bluff. Well one because my wife came here for the first time had a look around and from day one has said there is no way she is staying in this accommodation" (WM, Station B, Time 2)*
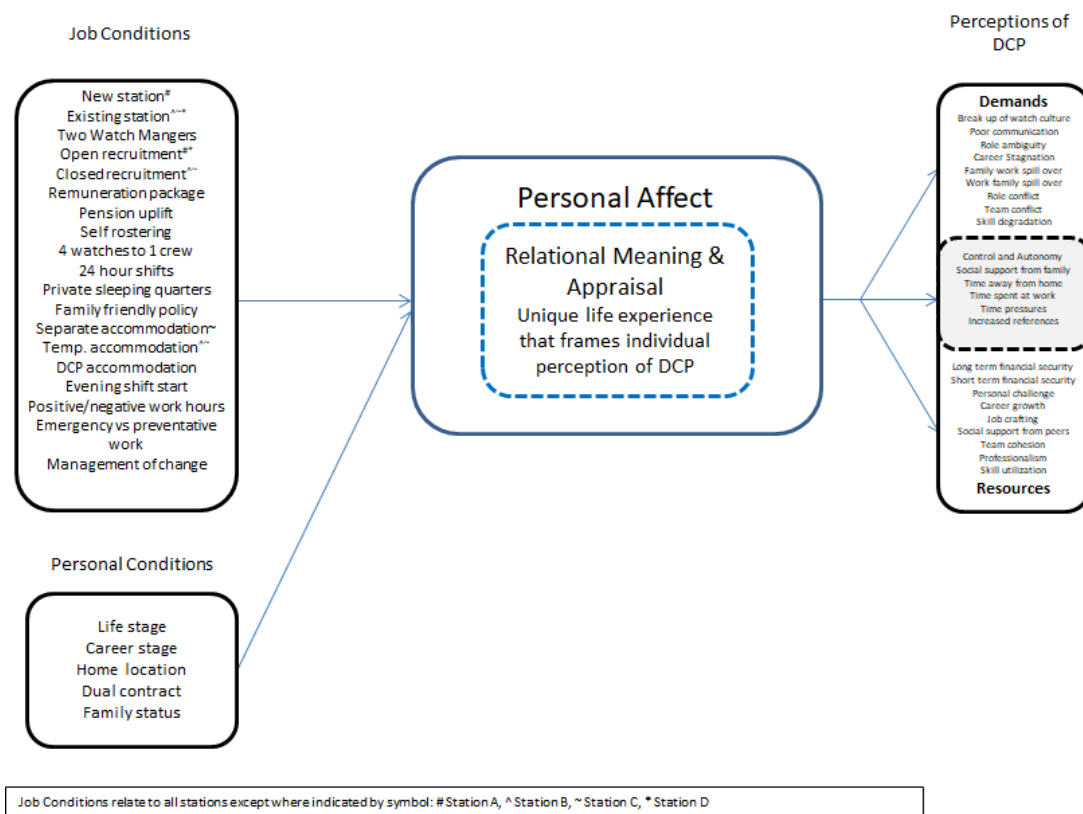
Figure 3. Conceptual representation of the influence of personal conditions on the perception of working ACA and the relationship with appraisal/relational meaning and personal affect

Participants who had dual contracts (offering part-time cover at a different station on an alerter from their homes) often compared ACA with their dual contract requirements. Some participants who had previously offered dual contract decided ACA afforded them the opportunity to stop providing retained cover (a reduced demand) due to the remuneration making up any lost income (thus conserving an important resource). For these participants ACA was seen as giving them greater autonomy and time (an energy resource), with the time demands expected from the 24-hour shifts seen as favourable to the expectations of the retained duty system. The time-based conflict between work and home life (a demand) was lessened.

> *"It's the fact that when I go home I am not on call. So before, all the time I was off from my whole time job I was on call on an alerter, so I could never, "oh, I fancy a beer today"… I mean for the last eight years I've done this whole time/retained and you get to the summer holidays and you can't go out with the kids…So now it has given me loads of flexibility in that respect."* ***(CM, Station A, Time 2)***

The time of the day in which negative hours were interrupted influenced how the demands of the interruption were appraised. Firefighters spoke of being disturbed between 4am and 7am as a physical demand with an associated loss of resource (recovery time) because of an inability to return to a restful sleep: disturbances earlier in the night could be buffered by resources as these allowed for appropriate rest and recovery once returned to the station. The evening start-time for shifts (19:00) was a top-down decision made to allow for negative hours to be recouped without the need to offer time off in lieu. Opinions about the impact of this feature of ACA were influenced by personal contextual conditions. Firefighters who lived a long way from the station felt it allowed them to travel at reasonable time of day and miss rush-hour traffic (time-based resource, or energy). Those with young families or who

lived closer to the station felt that their rest day was cut short or their day was dominated by thoughts of needing to go to work (framing this feature of ACA as a cognitive demand). The challenges linked to the new working hours were discussed more by firefighters at Station B and Station C. Some spoke of transitioning to ACA as consequence of their desire to remain at the station. Therefore, for some the changes to working hours were not a particularly attractive element of ACA.

The way in which ACA was introduced at the stations appeared to have an influence over how it was received. Those at existing 2:2:4 stations who wished to remain at the station felt they had to apply for their own jobs. Not everyone was successful and the selection criteria used was often seen by participants as unfair. The transition period at Station B and Station C was appraised as a hindrance, particularly for the junior officers, who spoke of the difficulties managing members of their watch who were unsuccessful in the recruitment process. Firefighters spoke of the cliques from the watch system filtering into the new system, with the self-rostering allowing for certain members of the crew to select shifts together. While this was resourceful for the individuals involved, those on the outside felt this impacted upon team cohesion as a whole (i.e. a hindrance demand).

> *"I think the big factor with coming to Station A is that everybody's in the same boat. ...whereas how I perceive it at other stations that have gone from the 2:2:4 to day crewing plus is to some degree you've got factions where...they still try to work things round how they used to work on the 2:2:4"***(FF, Station A, Time 2)**

Participants at Station B also spoke of a demanding transition period which filtered through into their talk about the shift system. For some participants the way in which the changeover was managed by senior officers was often the first and unprompted topic of conversation within the interviews, suggesting the cogency of the experience for those individuals. Negative emotions were mentioned throughout Station B interviews when talking about the transition, with the strength of feeling still evident at Time 3 for some individuals.

> *"I thought it got a bit kind of nasty with it and bit kind of bullying said things that didn't need to say like you know if you don't want to do it we will just send you to another station, there is no need for comments like that."* **(FF, Station B, Time 2)**

Within this appraisal process junior officers spoke of the need to balance competing demands in terms of performance targets for the station from senior management, such as Home Fire Risk Assessment (visits to private homes to fit smoke alarms) or risk visits (visits to high risk industrial properties), with the needs of their crew in terms of training and fitness. The uncertainty surrounding pension requirements and the cogency of the strike action appeared to influence how tasks were prioritised with Watch Managers appearing to have competing priorities within the same stations.

> *"With what's all going on with the pensions and working till 60 I can't say to the lads no you are not going to the gym today because they getting it from up there and the pensions are getting, and everything else is suffering...coz they are making us go to 60. So at the minute I'm making sure the lads get their fitness"* **(WM1, Station C, Time 2)**

> *"The understanding is if they start at ten o'clock then gym has to go and gym will get fitted in later on. So physical fitness time is the first thing that we cut when time gets squeezed."* **(WM2, Station C, Time 3)**

Problem-focused coping was a strong feature with many participants highlighting the need to be flexible and adapt tasks according to the particular demands with which they were faced. This meant things such as taking greater ownership or responsibility over tasks and having

greater accountability for the state of station (in terms of equipment, environment and the competence of staff). There was often talk about having a greater sense of pride over the station and the perception of being one big team. For junior officers, there was the need to have a flexible approach to the structure of the day, as planned tasks may need to be pushed back to recoup negative hours, or having a more efficient approach to targeted tasks.

> *"I guess you streamline how you do your work, so instead of going out and doing one job we'll go out and make sure that two or three other jobs that needed doing are done at the same time,"* **(WM1, Station C, Time 3)**

A reappraisal process occurs through experience and over time
The longitudinal nature of this study has allowed for the exploration of the appraisal process over time, indicating that it is a dynamic process. The demands and resources experienced by working ACA influenced many individuals' perceptions and relational meaning-making (Figure 4). These feedback loops then either provide reinforcement of the original affective response and appraisal or the formulation of an alternative. Rather than the appraisal of a demand or resource as static they appeared to form part of a dynamic transactional process, where individuals weigh up the costs and benefits of job conditions and personal conditions to provide coping behaviours.

For some the demands of the new system were as expected but the resources available to them allowed them to cope with the additional demands. For example, family support reducing the demand of being away from home, or physical resources on the station allowing for sufficient rest and recovery. For others, the demands were greater than expected and were using up their personal resources (ability to cope long term) to offset health impairment processes associated with demands. This was particularly evident amongst those participants with young children and working partners. Some participants from Time 1 and Time 2 interviews had returned to 2:2:4 at other stations by Time 3, therefore it appeared that some firefighters felt the demands were so great, leaving ACA was the most appropriate way of reducing demands and replenishing resources. In depth exploration of the reasons for their move is not possible as no interview data are available for these participants and so we are cautious not to speculate as to the motives behind these moves.
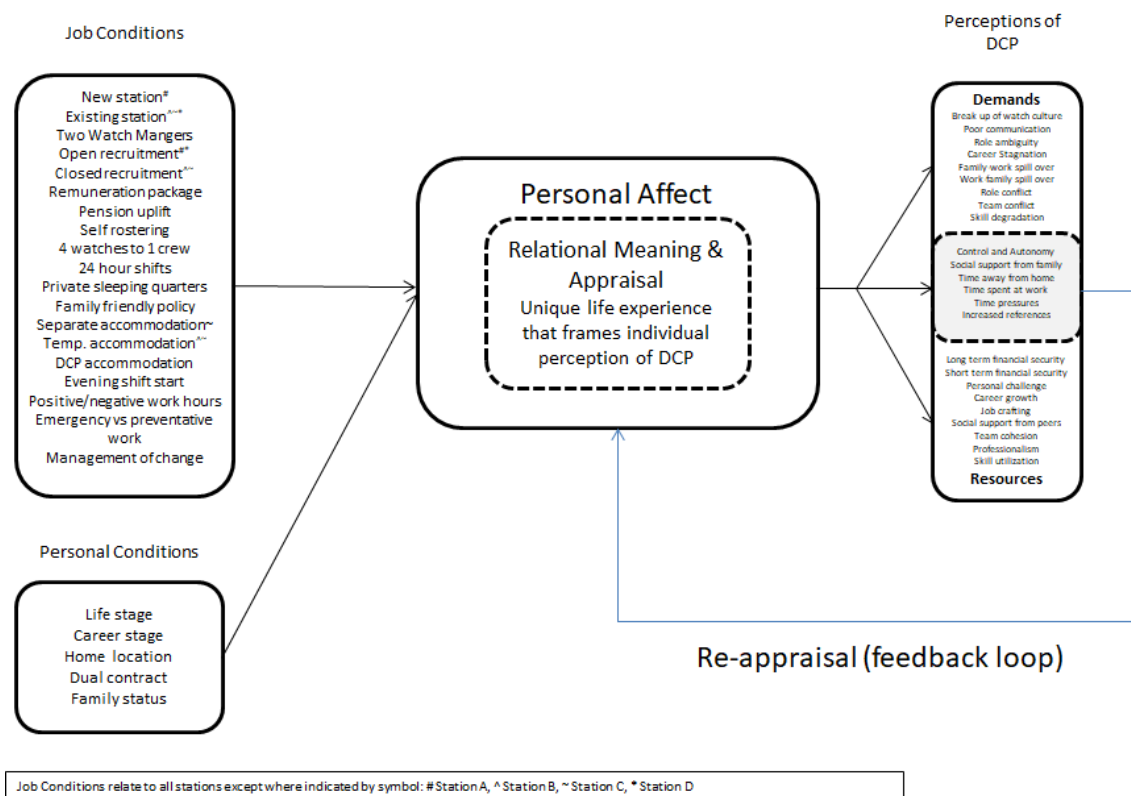
Figure 4. Full conceptual model with dynamic feedback loop

> *"I've gone from really not wanting to do it at the beginning to getting into it and not too sure, to thinking actually I'm quite happy here to getting to … What are we now? We're probably 16, 17 months into it, so I'm now starting to think sometimes it's getting a bit much because of the amount of time I'm here and it just feels that I'm here a lot."* **(CM, Station C, Time 3)**

Several interviewees commented that they felt that the length of unbroken time spent at the station could be detected in employees' moods, highlighting an affective component in the feedback loop. For those who regularly worked five-day blocks (referred to as "stretches") they felt their mood went through a cycle, starting positive with a dip in the middle few days and then rising again towards the end. Working around colleagues who were at different points in their cycle was seen as creating some additional hindrance demands, with those who had just started a batch working with others fatigued by being on the station for several days. There was the indication that fatigued participants appraised potential hindrance demands differently, with minor irritations being less demanding at the beginning of their batch of shifts. Junior officers spoke of the need to be mindful of how long each firefighter had been at work in order to manage the demands for each employee as well as balance the general work atmosphere.

> *"That's the balance isn't it you have got fresh people coming on and you have got people who have been here three days you can probably tell the difference, and you can probably tell how long you have been here"* **(FF, Station A, Time 3)**

In the interviews carried out soon after the implementation of ACA some participants felt that the loss of the 'watch culture' was a loss of resources. The watch was seen as providing a strong bond that would be lost through ACA. Some participants highlighted the extra time it would take to understand the crew's strengths and weaknesses at emergency call-outs because there was less time spent training or at incidents together. However, in later

interviews there was more evidence that more firefighters were seeing the opportunity to work with different colleagues as a positive development, with the ACA crew often referred to as "one big watch".

The reappraisal of the impact of ACA on family life was mixed, with some participants indicating that the demands or time-based conflict was not as great as they had expected. There was the acknowledgement that the impact was greater for partners than for the firefighters themselves indicating the spill-over of ACA work demands into the family domain. Some firefighters indicated that there was a joint appraisal/reappraisal process between themselves and their partner as to the demands of ACA for them as a family and the ultimate decision on whether to continue with the system would be with their partner.

Discussion

Within the context of the introduction of a new shift pattern we suggest that personal conditions can frame how participants view the structural work conditions as either resourceful or demanding. Certain job conditions were perceived as a demand or resource contingent upon the relational meaning and appraisal attached; supporting a transactional approach to wellbeing and Lazarus's assertion that appraisal is at the heart of the stress response (Lazarus, 1999). Recent developments of the JD-R model suggest the inclusion of personal resources in to the model as a mediator/moderator of job demands (Bakker and Demerouti, 2016; Schaufeli and Taris, 2014) however, findings from within this study suggests this may be too simplistic. Personal conditions differ from personal resources as they are not loaded in a positive (or negative) direction; they are relatively stable components of the self that provide a context within which the individual exists. Factors such as life stage, for example whether a participant has young children, or career stage, such as nearing retirement, are contextual conditions influencing the perception of demands and resources rather than being demanding or resourceful in their own right. Drummond and colleagues (2017) suggest that the presence of dependants does not produce a moderating effect between work-family conflict and wellbeing outcomes. Our study suggests that it may be the relational meaning attached to the age of any dependents that influences any perceived interference work may have in family life. Mark and Smith (2008) highlight the addition of personal factors into the JD-R as a useful direction in the development of the model, indicating the role that individual difference variables may play in the understanding of stress and work wellbeing, with an acknowledgement that 'personal resources' only go part of the way to that understanding. The conceptual model developed within this study provides an understanding of how individuals relate meaning to both personal and job factors based on experience, which can then lead to personal resources such as pro-active coping.

Interview data suggest the framing of job conditions as a demand or resource is more nuanced than the JD-R model affords. Job conditions within the JD-R model associated with being a resource, such as social support (Schaufeli and Taris, 2014), were seen as a demand by some participants. This is commensurate with work assessing the challenge-hindrance model of work stress noting that there is personal and situational variance in the appraisal of stressors (Gerich, 2016; Webster et al, 2011). The change in the structure of the working day was discussed as condensing tasks in to a shorter time-frame, increasing time pressures and the number of tasks that need to be performed. Many of the participants spoke of this being a positive challenge and enabled them to find creative, and more efficient, ways of working, rather than a hindrance. The JD-R acknowledges that these challenge demands, if they continue beyond a certain threshold, become a stressor rather than productive (Schaufeli and Taris, 2014), however it cannot prescribe what point and how overload occurs for any given individual. The individual differences in the experience of ACA suggest that the appraisal of demands and resources may be more value-driven than the JD-R model currently explains,

with those at the same rank, same station and same life stage having different perceptions of the process. Other individual differences not captured within the data, such as dispositional factors linked to work investment (Snir and Harpaz, 2012), may provide an understanding of the nuance in experience where work and personal conditions are seemingly the same.

Within many models of stress, control is seen as an important variable in the stress response (Bakker and Demerouti, 2007; Johnson and Hall, 1988; Karasek, 1979), with a central premise that personal control and decisional latitude over work demands are, in general, a good thing. For participants within this study, the increase in control over the work environment was not always seen as a positive. While many participants expressed greater control over when and how they work was beneficial, there were some participants, particularly at junior ranks, who preferred to be told when to be at work and, as such, the self-rostering was proving a demand. For these more junior firefighters, having greater control over their references was also initially a challenge, although this did diminish at Time 3. control is more than just a feature of work characteristics and processes and should be viewed as a more multi-dimensional construct (Troup and Dewe, 2002). The FRS culture with its military links and hierarchical structure (Baigent, 2001) may provide the context to understand why control was perceived negatively by the more junior firefighters.

Affective language was both explicit and implicit within the interviews, cutting across talk on demands and resources within ACA. Stress always implies emotion and therefore should be viewed as a key element of emotional states (Lazarus and Cohen-Charash, 2001, in Dewe et al., 2010). With top-down work conditions having the potential to create 'active and pleasurable work' or vice versa (Salanova et al., 2013; Bakker et al, 2011) the findings within our study highlight how employees relate the structural work conditions to their own personal circumstances and the potential for positive, neutral, or negative outcomes. It is not possible to ascertain the direction of causality between emotion and appraisal from the research design employed but the meaning-making surrounding ACA was bounded within related affective terms. Personal affect relates to the conscious expression of emotion and some of this can be explained by personal resources which have been added to the JD-R model, such as optimism or hardiness, (Bakker and Demerouti, 2016; Xanthopoulou et al., 2007) but there may be personal demands to consider, such as pessimism or rumination which are not currently accounted for within the model. The conceptual model allows for the explanation of how relatively stable aspects of the self can influence the appraisal and affective response of both job demands/resources and personal demands/resources.

Complementary models of wellbeing exist to explain differing aspects of the construct. Recent developments have seen the integration of the Transactional model with the Job Demand Control (Support) model (JDC(S)) (Karasek, 1979) to assess the degree to which specific job demands predict wellbeing outcomes whilst being simultaneously mediated by coping and moderated by control and supervisor support (Brough et al., 2017), indicating the utility of bringing the models together to gain a more rounded understanding of workplace wellbeing. Whilst the heuristic nature of the JD-R model (Bakker and Demerouti, 2007, 2016) allows for the specification of what kinds of job and personal characteristics lead to what kind of psychological state, this perspective is currently unable to explain how or why (Schaufeli and Taris, 2014). As such, it is necessary to supplement the JD-R model by integrating other models to help understand the psychological process behind the relationships between work and employee (Schaufeli and Taris, 2014), in this case the aspects of the ACA environment that have detrimental or enhancing effect on employees. We argue that combining the JD-R model with the ideographic approach afforded by the transactional model (Lazarus and Folkman, 1984) allows for the exploration of the intra-individual

processes underpinning the either positive or negative stress response to organisational change, like the introduction of ACA.

The conceptual model developed in this paper is proposed to explain the process of how demands and resources become framed as such by individuals. Thus, it builds on, extends, and is complementary to, the JD-R model (Figure 5). Through the attachment of relational meaning by the individual to their work and personal conditions, alongside a corresponding affective response, employees make an appraisal as to whether a given experience is demanding or resourceful. The personal meaning-making allows some demands to be framed as resources by certain individuals, and vice versa. The important contribution of this model is that it can help to explain the variance in demand/strain relationship in studies testing the JD-R model (Schaufeli and Taris, 2014). Perceptions of resources are argued to be personally constructed and value-driven (Hobfoll, 2011) and the differentiation between challenge demands and hindrance demands highlights that not all demands are equal (Crawford et al., 2010). Some resources, such as control, are suggested to be experienced negatively (Schaufeli and Taris, 2014), which is supported in the data for this paper. Transactions made between the individual and both their work and personal environments generate attributions to help make sense of the change in work conditions.
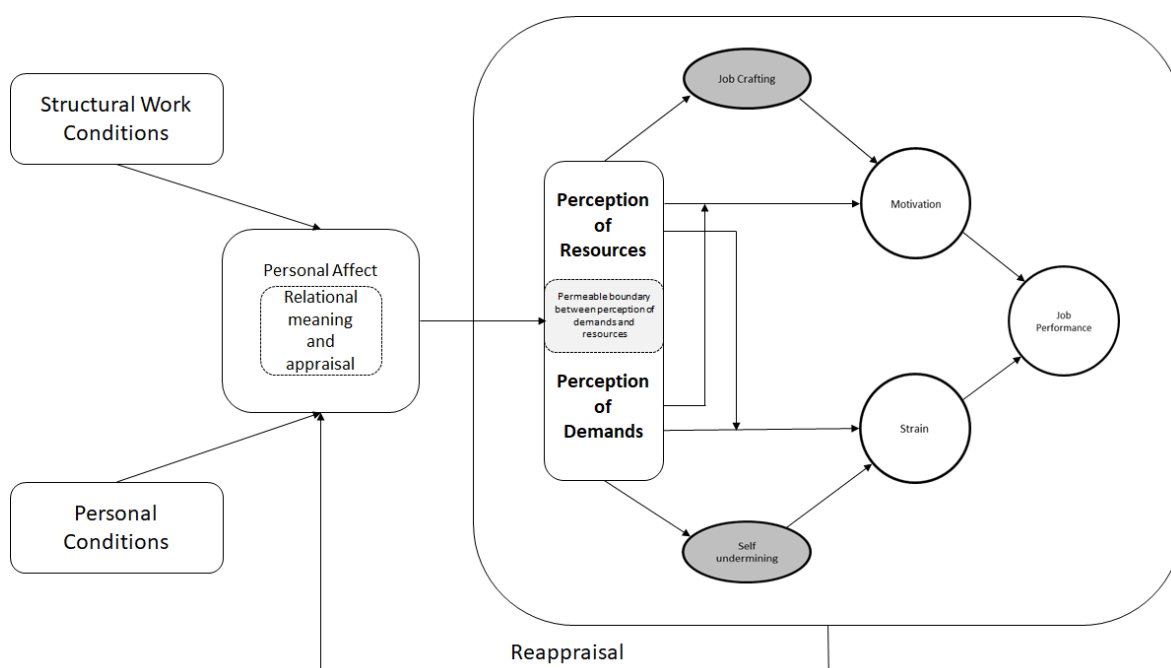

Figure 5. Expansion of JD-R model through integration with conceptual model

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Appendix 1: Coding Template

1. **Motivators for DCP**
   1.1. Individual motivators
      1.1.1. Long term financial benefit of pension
      1.1.2. Short term financial benefit from salary uplift
      1.1.3. Location of station
      1.1.4. To remain with friends
      1.1.5. For a challenge
      1.1.6. To remain at existing station
   1.2. Service/management motivators
      1.2.1. Cost saving/budgetary considerations
      1.2.2. Reduced emergency calls
      1.2.3. Political objectives
2. **DCP Creating Demands**
   2.1. Task demands
      2.1.1. Increased volume of work
      2.1.2. Altered tasks
      2.1.3. Not having skills or tools to complete tasks
   2.2. Time demands
      2.2.1. Less time to carry out tasks
      2.2.2. Negative hours affecting work tasks
   2.3. Role ambiguity
      2.3.1. Two watch manager system
         2.3.1.1. Fire fighters knowing what is expected of them
         2.3.1.2. Watch managers needing to share responsibility
      2.3.2. Ambiguity over opportunities for future career
   2.4. Poor relationships
      2.4.1. Strain on family relationships
         2.4.1.1. Work interfering with family
         2.4.1.2. Family interfering with work
      2.4.2. Negative relationships with immediate colleagues
         2.4.2.1. On station
         2.4.2.2. With 224 personnel
      2.4.3. Negative relationships with management
         2.4.3.1. Lack of communication
         2.4.3.2. Management using negative communication strategies
   2.5. Career stagnation
      2.5.1. Hindered promotion prospects
      2.5.2. Reduced training
3. **DCP Creating Resources**
   3.1. Job Crafting
      3.1.1. Task Crafting
      3.1.2. Cognitive crafting
      3.1.3. Relational crafting
   3.2. Self and career development
      3.2.1. Career progression
      3.2.2. Training and development
      3.2.3. Ability to develop outside interests
      3.2.4. Skill utilisation
      3.2.5. Identity as firefighter
   3.3. Control/autonomy
      3.3.1. Control over tasks
         3.3.1.1. References
         3.3.1.2. Emergency response
         3.3.1.3. Training
      3.3.2. Control over working time
         3.3.2.1. Selection of shifts
         3.3.2.2. Scheduling of the day
      3.3.3. Control over down time
         3.3.3.1. Negative hours
         3.3.3.2. Days off
   3.4. Physical resources
      3.4.1. The right equipment available as and when necessary
      3.4.2. Station facilities meeting the needs for work
      3.4.3. Accommodation suitable for rest and recovery
   3.5. Social support
      3.5.1. Support from colleagues
      3.5.2. Support from family/friends
      3.5.3. Support from manager

A. **Personal Conditions**
   (Integrative theme)
   A1. Life stage
   A2. Career stage
   A3. Distance to travel to work
   A4. Commitments outside of work
B. **Personal affect**
   (Integrative theme)
   B1. Positive affect
      B1.1. Optimism
      B1.2. Happiness
      B1.3. Hope
   B2. Negative affect
      B2.1. Pessimism
      B2.2. Hopelessness
      B2.3. Frustration
      B2.4. Anger