Fluctuating levels of personal role engagement within the working day: A multilevel study

Abstract

In this diary study, we examined a theoretical model in which the psychological conditions of meaningfulness, availability, and safety serve as mechanisms through which the work context during discrete situations within the workday influences 'state' engagement. We further theorised that a person's 'trait' level of engagement would exert cross-level effects on the 'state' level relationships. Multilevel analyses based on a sample of 124 individuals in six organisations and 1,446 situational observations revealed that meaningfulness and availability (but not safety) mediated the relationships between perceptions of the work context and 'state' engagement. High levels of 'trait' engagement strengthened the within-person relation between availability and 'state' engagement, yet weakened the within-person relation between meaningfulness and 'state' engagement; suggesting two different processes may be at play. Overall, the findings advance our understanding of engagement as a multilevel and temporally dynamic psychological phenomenon, and promote a contextually-based HRM approach to facilitating engagement.

Keywords: personal role engagement, meaningfulness, safety, availability, resources

Engagement has emerged as a relevant and useful concept within the human resource management (HRM) domain as it may help to explain how HRM facilitates positive employee outcomes (Alfes, Truss, Soane, Rees, & Gatenby, 2013; Saks & Gruman, 2014; Truss et al., 2013). Recently, it has been proposed that engagement operates at two distinct levels: as a steady, enduring mindset ('trait engagement') and as an experience that fluctuates over time ('state engagement') due to changes in an individual's perception of their work context (Bakker, 2014; 2015). In light of this, there have been calls for more studies that explore the antecedents of these momentary fluctuations in engagement, such as from one situation to another (Bakker, 2014; Ilies, Aw, & Pluut, 2015; Saks & Gruman, 2014). This also aligns with calls for more research on the 'lived' experience of engagement that can inform HRM scholarship (Purcell, 2014; Truss et al., 2013), for example how employees' experiences of organisational practices shapes employee behaviour through the state of engagement (Alfes et al., 2013; Conway, Fu, Monks, Alfes, & Bailey, 2015; Fletcher, 2016).

Recently, Bakker (2015) has suggested that more enduring 'trait' engagement may act as a moderator for the within-person processes that underpin 'state' engagement, and has argued that examining both within-person (or 'state') and between-person (or 'trait') processes together will enable further insight into the multilevel nature of engagement (Illies, Aw, & Pluut, 2015; Ilies, Pluut, & Aw, 2015). Such studies will address the need for research that furthers our understanding of the multilevel nature of various phenomena within the HRM domain (Shen, Messersmith, & Jiang, 2017).

To address these calls, we focus on the antecedents of 'state' engagement during discrete situations that arise during the course of the working day, and how individuals' levels of 'trait' engagement influence these experiences. The main aims of the current paper are to a) examine how and under what circumstances individuals might experience ebbs and flows in

their 'state' engagement during discrete situations within the working day, and b) test whether a person's level of 'trait' engagement may influence the psychological processes that underpin 'state' engagement.

To align with the interests of HRM scholars, we focus on Kahn's (1990) conceptualisation of personal role engagement rather than the more widely used conceptualisation of 'work engagement' as a higher-order construct comprising vigour, dedication and absorption in work activities (Schaufeli, Salanova, González-Romá, & Bakker, 2002). The concept of personal role engagement offers the potential to bridge the gap between psychological studies of engagement on the one hand, and the broader interests of the HRM community on the other, by emphasising the contextualised experience of engagement (Jenkins & Delbridge, 2013). A growing number of HRM scholars have been concerned that the developing field of work engagement is acontextual and potentially unrealistic in its depiction of lived experiences at work (Purcell, 2014). Conversely, Kahn's (1990) conceptualisation of personal role engagement as a deep, fulfilling psychological state associated with the expression of the authentic self at work is more aligned with notions of situated human agency (Cole, Walter, Bedeian, & O'Boyle, 2012; Rich, Lepine, & Crawford, 2010; Saks & Gruman, 2014).

Kahn's (1990) theoretical framework focuses on three psychological conditions, meaningfulness, availability and safety, which together must be present for the full experience of personal role engagement to occur. It has been argued that this framework is both parsimonious and comprehensive, and thus enables a better understanding of the antecedents of engagement (Crawford, Rich, Buckman, & Bergeron, 2014; Saks & Gruman, 2014). Moreover, Kahn's (1990) theorising focuses on the mediating role that specific psychological conditions play in connecting the wider work context with the experience of personal role engagement. In this sense, Kahn's (1990) theorising aligns closely with the

HRM literature concerning the role of mediating variables (Boxall, Guthrie, & Paauwe, 2016). Lastly, Kahn (1990) offers a multilevel perspective on engagement that addresses HRM interests (Shen et al., 2017), as he considers the 'discrete moments' in peoples' work lives within a broader social and organisational setting.

Despite Kahn's (1990) suggestion that variations in engagement levels *within the working day* are an inevitable feature of the experience of 'state' engagement, very little research that adopts the personal role engagement perspective has examined how engagement levels fluctuate in relation to specific situations (Roe & Inceoglu, 2016). In consequence, our knowledge of the engaging potential of individual work tasks and situations is limited (Saks & Gruman, 2014), and the utility of Kahn's (1990) framework for understanding 'state' level engagement has been neglected (Roe and Inceoglu, 2016).

In all, personal role engagement may hold promise in addressing the concerns of HRM scholars (e.g. Boxall et al., 2016; Purcell, 2014; Shen et al., 2017), as Kahn's (1990) theorising focuses not only on relevant mediating processes, i.e. psychological conditions, but also on advancing a multilevel, contextualised understanding of engagement. We address these identified gaps in the engagement literature by testing a multilevel model that uses Kahn's (1990) engagement construct. Our model is illustrated in Figure 1.

Specifically, we develop four sets of hypotheses grounded in Kahn's (1990) theorising on personal role engagement, and supplement and advance this understanding by drawing on insights from more recent theories and models. First, we draw on the job demands-resources (JD-R) model (Bakker & Demerouti, 2008) and the literature on daily work events to propose positive associations between the situational work context and 'state' engagement. Second, we utilise broaden-and-build (B&B) theory (Fredrickson, 2001) to argue that the psychological conditions of meaningfulness, availability and safety as identified by Kahn

(1990), are positively associated with 'state' engagement and act to mediate the association

between perceptions of the work context and 'state' engagement.

The final element of our model is the proposition that 'trait' level engagement serves to

moderate the association between the psychological conditions and 'state' engagement. In

this, we build on the recent insight from conservation of resources theory (COR) (Hobfoll,

2002) that general wellbeing, such as 'trait' engagement, can moderate the impact of daily

resources on state level wellbeing, such as 'state' engagement (Bakker, 2015; Ilies, Aw et al.,

2015; Ilies, Pluut et al., 2015).

In all, the current article makes the following contributions. Our study builds upon recent

developments in the HRM literature (e.g. Boxall et al., 2016; Shen et al., 2017) by examining

the 'experience' of engagement in a way that advances our understanding of the

psychological processes of engagement within its contextual setting (Purcell, 2014; Truss et

al., 2013). By examining temporal fluctations in conjunction with trait-level engagement,

we are able to reach a more refined understanding of the mutability of engagement, as well as

the interplay between state and trait processes (Bakker, 2015; Roe & Incleoglu, 2016). Given

that peoples' work lives are not static (Amabile & Kramer, 2011), and as engagement focuses

on the individual's subjective experience of their work role (Kahn, 1990; Saks & Gruman,

2014), it is important that the empirical examination of engagement reflects the temporal

reality of organisational life. In sum, we not only provide a more accurate test of Kahn's

(1990) theorising, but also advance it by examining in more depth the multilevel nature of

personal role engagement.

 INSERT FIGURE 1 HERE

Theory and Hypothesis Development

The antecedent work contextual conditions for 'state' engagement

Drawing on Kahn (1990), we argue that, at the situational ('state') level, perceptions of the work context will enable or constrain an individual's desire and capacity to engage. According to Saks and Gruman (2014), the JD-R model can be used to categorise these work contextual factors within Kahn's framework. This model defines resources as "physical, social, or organizational aspects of the job" (Bakker & Demerouti, 2008, p.211) that help individuals achieve work goals, reduce demands, and stimulate personal growth.

We focus on three resources that are especially relevant to 'state' engagement, as identified in prior research (Bakker, 2014; Bakker & Demerouti, 2008; Saks & Gruman, 2014), and that allow us to maintain parsimony and analytic power. First, *perceived task clarity* constitutes an organisation of work resource that will change during the day depending on the nature, scope and range of tasks being conducted, with some having an obvious and immediate purpose and others having a more ambiguous and indirect purpose. Second, *perceived access to resources,* such as such as computer software, project management tools, email and phone, constitutes an organisational resource that is likely to vary as different tasks will require access to different types of information and equipment. Third, *perceived co-worker support* constitutes a social resource that is likely to vary across the working day as the composition of, and interactions between, workgroup members will change according to the design of work tasks and the level of task interdependence. The need to examine the situational variation in these work contextual factors is also highlighted by work design and HRM theorists, who acknowledge the need to better understand the situated and dynamic nature of work practices and components of individual job roles (e.g. Clegg & Spencer, 2007; Jenkins & Delbridge, 2013).

Hypothesis 1a: Perceived task clarity is positively associated with 'state' engagement

Hypothesis 1b: Perceived access to resources is positively associated with 'state' engagement

Hypothesis 1c: Perceived co-worker support is positively associated with 'state' engagement

The antecedent psychological conditions for 'state' engagement

According to Kahn (1990), personal role engagement as a distinct and full experience occurs when three antecedent psychological conditions are present; namely psychological meaningfulness, availability, and safety. Although previous research has established that the three psychological conditions are positively related to engagement at the between-person ('trait') level (e.g. Chen, Zhang, & Vogel, 2011; May, Gilson, & Harter, 2004), no studies have examined them at the 'state' level. Therefore, we theorise and test these relationships first before subsequently building additional hypotheses.

Broaden-and-build (B&B) theory may explain how the psychological conditions lead to the experience of 'state' engagement. A core feature of B&B theory is that it is focused on the proactive and temporal nature of positive emotional states and how these then create longer term adaptive behaviour through *broadening* and *building* processes at the state level (Fredrickson, 2001). Both processes act synergistically to ensure the acquisition and development of critical personal/psychological resources (Cohn & Fredrickson, 2006). More precisely, the broadening process involves enlarging one's time horizon (i.e. incorporates past, present, and future), widening one's awareness and perceptual field, and increasing one's cognitive and psychological flexibility in such a way that the individual is empowered

to proactively explore his or her environment (Fredrickson & Branigan, 2005). This subsequently leads to a building process in which these broadened thought-action repertoires lead to strategic investment of energies into behaviours that encourage the development of specific adaptive or functional skills and resources (Fredrickson, 2001).

Although B&B theory originally focused on the effects of discrete positive emotions, it has been recently applied to better understand the psychological processes that underpin broader motivational states, in particular that of engagement (e.g. Fletcher, 2016; Salanova, Schaufeli, Xanthopoulou, & Bakker, 2010; Soane et al., 2013). Connecting this literature with Kahn's (1990) theorising, we argue that, during discrete situations, three psychological conditions are associated with a broadening of the individual's thought-action repertoire (broadening hypothesis), and this then leads to the development of resources needed for optimal psychological functioning or the alleviation of negative experiences (building hypothesis).

Psychological meaningfulness arises when the individual feels that their work role is "worthwhile, useful and valuable" (Kahn, 1990, p.703-704). Individuals who find their work tasks meaningful experience a 'broadened' perception of the potential behavioural expressions of engagement and, in consequence, will be able to 'build' cognitive resources and energies needed for sustained engagement (Soane et al., 2013). Thus, meaningfulness activates a reinforcing affective-cognitive process that incentivises the investment of energies into engaging in situations, which are likely to deepen and expand one's sense of self (Kahn & Heaphy, 2014). Amabile and Kramer's (2011) study reveals that situations where the individual feels they have made progress in personally meaningful work tasks leads to them feeling happier and more motivated to perform well. Therefore, situations where one's work tasks are viewed as personally meaningful are likely to generate higher levels of engagement.

> *Hypothesis 2a:* Meaningfulness is positively related to 'state' engagement.

Psychological availability signifies a "sense of having the physical, emotional and psychological resources to personally engage at a particular moment" (Kahn, 1990, p.714). These perceptions are likely to 'broaden' an individual's thoughts and actions regarding how and when they will invest (i.e. engage) themselves in their work role, and will 'build' enduring emotional resources, such as resilience, needed for engagement (Salanova et al., 2010). Research by Zohar, Tzischinski and Epstein (2003) shows how the availability of energy resources are important for emotional and behavioural states. Thus, situations where psychological availability is high will likely be associated with high levels of engagement.

Hypothesis 2b: Availability is positively related to 'state' engagement.

Lastly, *psychological safety* represents "feeling able to show and employ one's self without fear of negative consequences to self-image, status, or career" (Kahn, 1990, p.708), and enables individuals to take interpersonal risks within their work environment (Edmondson, 1999). Thus, safety constitutes a way in which individuals can 'broaden' the opportunities within their workgroup that enable self-expression, which in turn 'build' positive relational resources needed to strengthen social bonds and engagement (Cohn & Fredrickson, 2006; Kahn & Heaphy, 2014). There is also emerging evidence showing that task-specific perceptions of the similar construct of relatedness are associated with task-specific engagement (Bakker et al., 2012 cited in Bakker, 2015). Thus, engagement is likely to be higher during situations that enable the individual to voice thoughts and feelings openly.

Hypothesis 2c: Safety is positively related to 'state' engagement.

The mediating role of the psychological conditions

Kahn (1990) proposes that the psychological conditions act to connect perceptions of the work context with the experience of personal role engagement. This is for two reasons, first,

because individuals in resourceful work environments will feel better able to mobilise their

own internal resources in ways that enhance intrinsic motivational processes (Salanova et al.,

2010; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2009) and, second, because the three

psychological conditions work together as independent, yet related critical needs that parallel

a relational psychological contract (Kahn, 1990). This is consistent with B&B and COR

theories, which both indicate that socio-emotional resources will facilitate the development of

positive psychological resources, which in turn will maximise motivational states and

behaviours (Fredrickson, 2001; Hobfoll, 2002). However, no prior studies have tested these

propositions at the task/situational level as Kahn (1990) theorised, and so this is the first test

of these mediation effects on 'state' engagement.

More specifically, if the individual deems the purpose of work tasks to be clear and important

(i.e. task clarity), then they will be more likely to ascribe meaning to their work due to feeling

part of a larger and defined endeavour, which in turn will facilitate their engagement (Kahn &

Heaphy, 2014). Understanding the purpose and scope of tasks also enables feelings of

competence to develop that help one to accomplish work goals through feeling able to deal

with various demands, i.e. psychological availability, and feeling confident in taking

interpersonal risks, i.e. psychological safety (Bakker et al., 2012 cited in Bakker, 2015;

Fernet, Austin, Trépanier, & Dussault, 2013).

> *Hypothesis 3a:* Meaningfulness mediates the relationship between perceived
> task clarity and 'state' engagement.

> *Hypothesis 3b:* Availability mediates the relationship between perceived task
> clarity and 'state' engagement.

> *Hypothesis 3c:* Safety mediates the relationship between perceived task
> clarity and 'state' engagement.

Being able to access resources, such as useful information and equipment, is likely to influence meaningfulness as it may provide the individual with opportunities to gain further awareness and understanding of how their daily work tasks contribute to the wider organisation (Amabile & Kramer, 2011; Spreitzer, 1995). When the individual has to use their finite energies to deal with the problems caused by missing, outdated or flawed equipment or information then psychological availability will decrease (Crawford et al., 2014). Perceived access to resources will also likely influence the individual's sense of psychological safety because accessing resources may help to clarify the boundaries of acceptable behaviour and sustain a predictable work environment (Edmondson, 1999).

> *Hypothesis 4a:* Meaningfulness mediates the relationship between perceived access to resources and 'state' engagement.

> *Hypothesis 4b:* Availability mediates the relationship between perceived access to resources and 'state' engagement.

> *Hypothesis 4c:* Safety mediates the relationship between perceived access to resources and 'state' engagement.

Interpersonal interactions with co-workers within the workday will facilitate meaningfulness because perceived support during these interactions will likely strengthen one's sense of social identity within the workgroup, whereby individuals feel part of a shared endeavour (Amabile & Kramer, 2011), as well as providing emotional resources that can bolster availability (Salanova et al., 2010). Day-to-day supportive interactions with co-workers also help facilitate psychological safety because perceptions of social support enable the individual to take interpersonal risks, such as expressing authentic thoughts without fear of negative consequences, as they feel valued and secure within their workgroup (Kahn & Heaphy, 2014).

Hypothesis 5a: Meaningfulness mediates the relationship perceived co-worker support and 'state' engagement.

Hypothesis 5b: Availability mediates the relationship between perceived co-worker support and 'state' engagement.

Hypothesis 5c: Safety mediates the relationship between perceived co-worker support and 'state' engagement.

The moderating role of 'trait' engagement

Personal role engagement will fluctuate over the course of the workday, yet a person will additionally hold more generalised perceptions about their engagement, labelled as 'trait' engagement (Ilies, Aw et al., 2015; Roe & Inceoglu, 2015). Although most within-person studies on work engagement have acknowledged this distinction by controlling for the direct effect of 'trait' engagement (e.g. Xanthopoulou et al., 2009), they neglect to consider important interconnections between 'state' and 'trait' engagement, such that a person's 'trait' level engagement may influence the processes that underpin 'state' engagement (Bakker, 2015). Drawing on Kahn's (1990) rationale that the psychological conditions are the most proximal factors for engagement, we argue that 'trait' personal role engagement acts to influence the relations between the psychological conditions and 'state' personal role engagement.

According to COR theory (Hobfoll, 2002), individuals with greater psychological resources will be more likely to utilise opportunities to invest resources in order to enhance their wellbeing. As individuals with high 'trait' levels of personal role engagement are highly psychologically resourceful (May et al., 2004), they will be willing to risk investing their personal energies and resources into discrete situations, in the form of psychological meaningfulness, availability, and safety. This is consistent with the notion of 'resource gain

spirals' (Salanova et al., 2010) in which individuals with a significant resource pool are more likely to acquire additional resources. Conversely, those with low 'trait' engagement will not as willingly risk such investment of their energies due to fear of further resource loss (Hobfoll, 2002), or because all their energetic resources are depleted (Bakker, 2015). Therefore, 'trait' engagement may strengthen the relationship between psychological meaningfulness, availability, safety and 'state' engagement.

> *Hypothesis 6a:* The positive association between availability and 'state' engagement is strengthened by 'trait' engagement**.**

> *Hypothesis 6b:* The positive association between meaningfulness and 'state' engagement is strengthened by 'trait' engagement.

> *Hypothesis 6c:* The positive association between safety and 'state' engagement is strengthened by 'trait' engagement.

Method

Participants

Participants were drawn from six UK-based organisations across three sectors: manufacturing, professional services, and the public sector. A total of 151 participants were recruited, of whom 124 completed the work diary (82% response rate): 40% were male, 42% had managerial responsibility, and 80% were on full-time contracts. The average age was 39.3 years ($SD = 11.4$) and the average tenure in the organisation was 9.1 years ($SD = 7.9$). All permanent employees within the organisation were contacted by the lead researcher via email and face-to-face briefing meetings; those interested in taking part in the study informed the researcher who then gained their informed consent. A small cash incentive was used to maximise participation and to gain a mix of different workers.

Quantitative work diaries

Participants were asked to complete a diary; diaries are a good way of gathering data on characteristics in the work environment which are subject to fluctuations (Bakker, 2014). We decided to focus on particular 'engagement' events to best capture the peak and trough moments of personal role engagement, as theorised by Kahn (1990), considering the constraints of respondents' time and resources to complete the questionnaire within their working day. Therefore, participants were instructed to reflect upon their workday and to identify two specific work events or situations that occurred during the day in question when they felt a) most and b) least positive about, focused on, and physically motivated to invest effort into their job role (Rich et al., 2010). Individuals were randomly assigned to a paper-based work diary pack ordered either with the most or the least engaging work situation presented first for each daily work diary. All participants gave ratings of perceived task clarity, co-worker support, organisational resources, meaningfulness, availability, safety, and engagement for both types of situation at the end of the workday for each of the daily work diaries, and were asked to choose a total of six working days across a three-week period that collectively reflected the scope of their job role. Participants were encouraged to jot down notes of any significant events as they occurred, so that they could recall these when they came to complete the day's entry. The average duration was 19 days (*SD* = 7).

Between-person measures

'Trait' personal role engagement. We measured 'trait' personal role engagement once at the start of the study using a 12-item shortened version of Rich et al.'s (2010) scale. This measure captures the three dimensions of personal role engagement: emotional (e.g. *'I am enthusiastic in my job'*), cognitive (e.g. 'At work, *I focus a great deal of attention on my job'*), and physical (e.g. *'I exert my full effort to my job'*). We instructed individuals to rate each statement on a 7 pt Likert scale (1 – strongly disagree to 7- strongly agree) according to

how they generally felt about their job. Inter-item reliability was $\alpha = .96$, Confirmatory factor analyses (CFAs) found that the three-dimensional factor structure was adequate: $\chi^2(51) = 150.09$, $p < .001$; RMSEA = .12, CFI = .92, SRMR = .05. This three factor solution was a better fit than the one factor alternative: $\Delta\chi^2(3) = 179.24$, $p < .001$.

Control variables.   Drawing on recommendations by Becker (2005), we controlled for gender (1 = male, 2 = female), tenure (in years), management responsibility (0 = no management responsibility, 1 = has management responsibility), and public sector organisations (0 = not a public sector organisation, 1 = public sector organisation) at the between-person level as these were significantly correlated with at least one dependent variable.

Within-person measures

For each type of situation (most/least engaging), participants were instructed to rate their level of engagement and to rate how they perceived their work environment and felt, psychologically, during that time. All measures, unless otherwise stated, used a 7-pt Likert scale (1 – strongly disagree to 7- strongly agree), and were modified to reflect a situational perspective, e.g. 'during that time ….'.

'State' personal role engagement.   We used a 12-item shortened version of Rich et al.'s (2010) scale capturing the three dimensions of personal role engagement that align with Kahn's (1990) conceptualisation: emotional (e.g. *'During that time, I was enthusiastic about my task'*), cognitive (e.g. '*During that time*, *I focused a great deal of attention to my task'*), and physical (e.g. '*At the time*, *I exerted my full effort to my task'*). At each measurement occasion, participants were instructed to rate each statement according to how they felt about their job tasks during the time that the situation took place within that workday. Inter-item reliability across measurement occasions ranged from $\alpha = .93$ to .96 (mean $\alpha = .94$).

Furthermore, multilevel CFAs confirmed that the three-dimensional factor structure was a reasonable fit: $\chi^2(102) = 910.96$, $p < .001$; RMSEA = .07, CFI = .95, SRMR between = .06, SRMR within = .05. This model was a better fit than the one factor alternative: $\Delta\chi^2(6) = 1975.76$, $p < .001$

Task clarity.   Langford's (2009) three item 'role clarity' scale was used, e.g. *'I understood my goals and objectives and what was required of me during that time'*. Inter-item reliability ranged from $\alpha = .63$ to .86 (mean $\alpha = .70$).

Access to resources.   Langford's (2009) three item 'resources' scale was used, e.g. *'During that time I had access to the right equipment and resources to do my task well'*. Inter-item reliability ranged from $\alpha = .66$ to .90 (mean $\alpha = .81$).

Co-worker support.   We used Gillen, Baltz, Gassel, Kirsch, and Vaccaro's (2002) four item 'co-worker support' scale, e.g. *'During that time, my co-workers were helpful in getting the task done'*. Inter-item reliability ranged from $\alpha = .86$ to .94 (mean $\alpha = .92$).

Meaningfulness.   We used Spreitzer's (1995) three item 'meaning' scale, e.g. *'The work I was doing during that time was very important to me'*. Inter-item reliability ranged from $\alpha = .84$ to .96 (mean $\alpha = .92$).

Availability.   May et al.'s (2004) five item 'psychological availability' scale was used, e.g. *'During that time, I was confident in ability to deal with problems'*. Inter-item reliability ranged from $\alpha = .81$ to .92 (mean $\alpha = .87$).

Safety.   Brown and Leigh's (1996) four item 'self-expression' scale was used, e.g. *'During that time, I felt completely free to be myself'*. Inter-item reliability ranged from $\alpha = .88$ to .95 (mean $\alpha = .91$).

Control variables.   Drawing on recommendations by Becker (2005), we controlled for three

main factors at the within-person level. First, we controlled for the effect of time by including

a continuous variable that represented each diary entry (*n*) as the number of days that had

passed from the first diary entry to the nth diary entry. Second, the type of situation was

entered as a categorical variable with 1 representing the most engaging situation and 2

representing the least engaging situation. Third, to control for 'good day/bad day' effects

(Sheldon, Ryan, & Reis, 1996) participants were asked to rate two statements on a 7-point

(strongly disagree to strongly agree) Likert scale: *'All things considered, I had a good day at*

work today', 'All things considered, I had a bad day at work today' (r). Inter-item reliability

ranged from $\alpha = .71$ to .87 (mean $\alpha=.80$). The aggregate score for these two statements was

entered as a continuous variable for each of the diary days for each person.

Analytical method

Multilevel modelling was conducted using MLwiN version 2.26 (Rashbash, Steele, Browne,

& Goldstein, 2012). The data was hierarchically ordered at two levels: measurement occasion

($N =1446$ occasions) clustered within the individual ($N =124$). IGLS estimation was used,

higher-level variables were grand-mean centred, whereas lower-level variables were centred

on the person's mean. We initially conducted two separate multilevel analyses – one for the

most engaging situations and one for the least engaging situations; but as the results were

very similar we decided to combine the two into one multilevel analysis to reduce

multicollinearity.

Baron and Kenny's (1986) four conditions for examining mediation were followed. Table 3

shows four models with 'state' personal role engagement as the dependent variable. Model 1

was the control model, which included all control variables. Model 2a extended this by

including the work context variables to test the first condition for mediation (and Hypotheses

1a to 1c). Model 2b also extended Model 1 by including the three psychological conditions to test the second condition for mediation (and Hypotheses 2a to 2c). To test the third condition for mediation, a separate set of multilevel analyses was undertaken, also shown in Table 3. These examined each psychological condition as the dependent variable, with the work context and control variables as predictors. Finally, Model 3 examined the effects of the work context and psychological condition variables together to test the final condition of mediation. The Monte Carlo Method for Assessing Mediation (MCMAM – Selig & Preacher, 2008) was used to verify mediation effects (testing Hypotheses 3a to 3c, 4a to 4c, and 5a to 5c), and the completely standardised indirect effect size was calculated (Preacher & Kelley, 2011).

Lastly, to test for cross-level moderations (and Hypothesis 6a to 6c), we conducted the following sequence of multilevel models in line with Aguinis, Gottfredson, and Culpepper (2013): Model 1 – inclusion of within-person predictors; Model 2 – allowing variation in slopes of the within-person (interaction) predictors; Model 3 – adding between-person predictors; and Model 4 – adding cross-level interactions. The significance of the simple slopes was tested at low (-1SD) and high (+1SD) levels of the moderator (Preacher, Curran, & Bauer, 2006), and the effect size focusing on the cross-level interaction's explanatory power was calculated (Aguinis et al., 2013, p.1518). We chose not to add back in the group level means as meaningfulness, availability, safety are not conceptualised as trait-level constructs (Kahn, 1990); however, we re-ran the multilevel model for model 4 in Table 4 with the person level means for meaningfulness, availability and safety included. The co-efficients for the three interactions were very similar to their respective values in model 4, and so we proceeded to exclude person level means of the lower-level predictors.

Results

Descriptive statistics

The intraclass correlation showed that 66.2% of variance in 'state' personal role engagement

was attributed to within-person fluctuations, supporting the application of multilevel analysis.

Means, standard deviations and correlations are given in Table 1.

 INSERT TABLE 1 HERE

Measurement models

MCFAs were conducted to verify the hypothesised measurement model of the within-person

variables, and to control for the influence of common method bias. The 'state' personal role

engagement factor was represented as its three dimensions. The hypothesised model was a

good fit: $\chi^2(508) = 459.99$, $p < .001$; RMSEA = .04, CFI = .95, SRMR within = .05, SRMR

between = .09; and this measurement model was a better fit than more parsimonious

alternatives.

Test of hypotheses

Table 2 shows the results of the multilevel models for testing the conditions for mediation.

Model 2a was a better fit of the data than the control model (Model 1). All three work context

variables were positively associated with 'state' personal role engagement, thus meeting the

first condition of mediation and supporting Hypotheses 1a, 1b, and 1c. Model 2b was a better

fit of the data than the control model. There was a significant positive effect of

meaningfulness and availability; however, there was no significant effect of safety. These

findings support Hypotheses 2a and 2b (but not 2c); and broadly meet the second condition of

mediation. Further, as also detailed in Table 2, all three work context variables were

positively related to all three psychological conditions, thus meeting the third condition of mediation. Finally, Model 3 was a better fit of the data than Model 2a. The inclusion of meaningfulness, availability, and safety reduced the significance of the work context variables considerably, thus meeting the fourth and final condition of mediation.

 INSERT TABLE 2 HERE

Mediation tests. To ascertain whether these indirect effects were significant, MCMAM tests were performed (Selig & Preacher, 2008). MCMAM is a repeated simulation (20,000 repetitions) of *a* (relationship between predictor and mediator) *x b* (relationship between mediator and dependent variable) whereby mediation should be accepted if the 95% confidence interval of the indirect effect does not contain zero. As Table 3 shows, task clarity, access to resources, and co-worker support were each indirectly related to 'state' personal role engagement via meaningfulness and availability. Moreover, these indirect effects exhibited a relatively small effect size. Safety was not a significant mediator for any of the relationships. Overall, these tests support Hypotheses 3a, 4a, and 5a (meaningfulness as mediator) as well as 3b, 4b, and 5b (availability as mediator), but not 3c, 4c, or 5c (safety as mediator).

 INSERT TABLE 3 HERE

Moderation effects. Table 4 shows the results of the multilevel models testing cross-level moderation effects on 'state' personal role engagement. Model 2 was a better fit than Model 1, and showed that the relationships between the psychological conditions and 'state' personal role engagement varied across individuals, thus supporting the progression in later models to cross-level moderation. Model 3 was a better fit than Model 2, and showed that

'trait' personal role engagement was positively associated with 'state' personal role engagement. Lastly, Model 4, which included the cross-level interaction terms, was a better fit than Model 3.

As predicted, there was a significant positive interaction between 'trait' personal role engagement and availability whereby the simple slope was significant at high, but not at low, levels of 'trait' personal role engagement ($z = 2.12$, $p < 05$; $z = -0.21$, $p > .05$). This suggests that the positive relationship between availability and 'state' personal role engagement only occurred for individuals with a high level of 'trait' personal role engagement. The effect size was fairly substantial, as 'trait' personal role engagement explained 23% of between-person variance in the availability slope. In contrast, the opposite was true for meaningfulness, i.e. the simple slope was significant at low, but not at high, levels of 'trait' personal role engagement ($z = 1.98$, $p < .05$; $z = 0.40$, $p > 05$). Thus, suggesting that the positive relationship between meaningfulness and 'state' personal role engagement only occurred for individuals with a low level of 'trait' personal role engagement. The effect size was relatively modest as 'trait' personal role engagement explained 13% of between-person variance in the meaningfulness slope. These two interactions are plotted graphically in Figures 2 and 3. There was no significant interaction between 'trait' personal role engagement and safety. Collectively, these results support Hypotheses 6a, but not 6b or 6c.

 INSERT TABLE 4 HERE

 INSERT FIGURE 2 HERE

 INSERT FIGURE 3 HERE

Additional tests. Although testing all theoretical components together in a model is recommended (Aguinis et al., 2013), there is value in understanding if any of the results are significantly different when each psychological condition is considered separately. Therefore, we carried out additional analyses for Model 3 in Table 2 and Model 4 in Table 4 (see supplementary information). These show that results are largely similar, however two effects are different. First, the direct effect of safety on 'state' personal role engagement becomes statistically significant when considered separately ($\gamma = .074$, $p < .001$; $\gamma = .006$, $p > .05$). We re-ran the MCMAM tests with this information and found similar results to those in Table 3, i.e. no significant indirect effects of safety. Second, the cross-level interaction between meaningfulness and 'trait' personal role engagement reduced to non-significance when considered separately ($\gamma = -.030$, $p > .05$; $\gamma = -.071$, $p < .05$).

Discussion

Given calls to test multilevel theories within the HRM domain (Shen et al., 2017) and to further explore the situational antecedents of 'state' engagement (Bakker, 2015; Ilies, Aw et al., 2015; Saks & Gruman, 2014), our quantitative diary study examined how personal role engagement, as a 'state', fluctuates across the working day, and how individual differences in 'trait' engagement may influence 'state' level processes.

We first tested whether perceptions of the work context during discrete situations, namely task clarity, access to resources, and co-worker support, would be positively related to 'state' personal role engagement. We found full support for these hypotheses, and so these findings suggest that the JD-R model is an appropriate framework to categorise features of the work and task context in a meaningful way (Saks & Gruman, 2014). The findings also advocate an events-based (i.e. situational) perspective, based upon Kahn's (1990) theorising, for understanding the phenomenological experience of 'state' engagement.

Next, we examined whether the psychological conditions of meaningfulness, availability, and safety would be positively associated with 'state' personal role engagement. The findings affirm two of Kahn's (1990) psychological conditions (meaningfulness and availability) as particularly important for the experience of personal role engagement within the working day, and extend existing between-persons studies that have demonstrated these relationships at the 'trait' level (Chen et al., 2011; May et al., 2004; Soane et al., 2013).

However, we found that although safety is significant for 'state' engagement when considered alone, it loses its unique effect when considered alongside meaningfulness and availability. This suppression effect indicates that meaningfulness and availability are more powerful for 'state' personal role engagement than safety. This may be because safety is likely to change more gradually over time due to the evolution of other pervasive features of the employee-employer relationship, or because the focus on self-expression in the measure we used was a too specific and narrow aspect of safety. Despite this, our results tentatively support the notion that a cognitive-affective motivational process, based on B&B theory (Fredrickson, 2001), underpins personal role engagement, such that meaningfulness 'broadens' the behavioural outcomes of engagement and 'builds' cognitive resources, and availability 'broadens' decisions regarding how and when engagement will occur and 'builds' emotional resources. Future studies should therefore further apply and test B&B theory to better understand the processes underpinning personal role engagement.

Our study also provides support for the mediational roles of meaningfulness and availability (but not safety) in connecting the work context with the experience of personal role engagement (Chen et al., 2011; May et al., 2004) by demonstrating how this occurs at the 'state' level. Thus, the findings empirically extend existing within-person studies examining mediating personal resources (e.g. Xanthopoulou et al., 2009) by showing how Kahn's (1990)

psychological conditions can be used as a suitable explanatory framework for personal role engagement (Saks & Gruman, 2014), particularly as all three contextual factors were found to simultaneously influence more than one psychological condition (Crawford et al., 2014).

Finally, we extended this model by drawing on recent theorising on the multilevel nature of engagement (Bakker, 2015; Illies, Pluut et al., 2015) and COR theory (Hobfoll, 2002) to examine the moderating role of an individual's 'trait' level of engagement. Thus, our study provides one of the first empirical tests of Bakker's (2015) proposition that an individual's 'trait' level of engagement will interact with the psychological processes that underpin engagement at the within-person (i.e. 'state') level. As predicted, 'trait' personal role engagement strengthened the relationship between availability and 'state' personal role engagement. Individuals who were generally highly engaged were more likely than those who were not highly engaged to focus their energies into engaging within situations that offer plentiful resources that fulfil their need for availability. However, 'trait' personal role engagement did not significantly strengthen the relationship between situational safety and 'state' personal role engagement, and was found to weaken the relationship between meaningfulness and 'state' personal role engagement (although this became non-significant when this interaction was considered alone). Therefore, this provides equivocal support for the gain spiral proposition (Salanova et al., 2010) of COR theory (Hobfoll, 2002).

The finding of a weakening effect of 'trait' engagement on the relationship between situational meaningfulness and 'state' engagement indicates that further research is needed to better understand the interplay between 'trait' and 'state' processes. Recently, Halbesleben, Neveu, Paustian-Underdahl, and Westman (2014) argue there may be situations where resource investment occurs for individuals with generally low levels of psychological resources (indicative of low 'trait' engagement). Importantly, although these individuals

become more defensive and tend to scale back on resource investment, they may invest in strategic ways that help achieve goals and desired outcomes following specific cues/signals within the psychological work context. This rationale also reflects Kahn's (1990) self-in-role calibration process, in which the self seeks to maintain a sustainable level of engagement with the role: an individual will "seek to protect themselves from both isolation and engulfment by alternately pulling away [i.e. disengaging] and moving toward [i.e. engaging] their memberships" (Kahn, 1990, p.694).

Therefore, it may be that 'trait' engagement could weaken the relationships between certain psychological resources and 'state' engagement. Our study indicates that this may apply in the case of meaningfulness, although this needs further empirical testing as this did not hold when the interaction was considered on its own. We would welcome future research in this area that utilises Roe and Inceoglu's (2016) method for examining temporal dynamics. This method offers a more precise way to combine within and between person analyses as it assesses trajectories and variations using three core time parameters: a specified timeframe, the starting point, and the number of observations.

Practical implications

The core implication of the study underscores the need to understand and promote engagement at the 'state' level. Efforts to raise engagement should focus on creating opportunities within everyday work situations that enable workers to feel that their work is valuable and worthwhile, and that they feel capable and confident to give more of themselves at work. Ensuring work tasks are clear and purposeful, facilitating access and sharing of organisational resources, and promoting social support and high-quality co-worker relations within day-to-day work activities can help in this regard. These are important given that contemporary work design theories acknowledge that "job designs are flexible and adjustable in the short term" (Clegg & Spencer, 2007, p.322) and HRM scholars are increasingly finding

that contextual and temporal contingencies influence how HRM impacts employees (e.g.

Jenkins & Delbridge, 2013).

The study also highlights how organisations could use staff surveys to provide a useful

indication of 'trait' engagement. From analysing this data, HRM practitioners could modify

engagement initiatives slightly towards the individual's general 'trait' level of engagement. In

particular, for those who are highly engaged, initiatives could include more activities that

strengthen personal resources within daily work situations, such as resilience. For those

lacking such engagement, our findings tentatively suggest that initiatives could incorporate

more activities that develop meaningfulness within daily work situations. Given that many

organisations conduct staff surveys to better understand the engagement of their workforce

(Purcell, 2014), this may be a useful practical implication.

Additionally, these findings have potential implications for how managers delegate and

organise work tasks within their teams. Those who are less engaged may benefit from being

given slightly more tasks, resources and social support that help them develop their sense of

purpose and worth (i.e. meaningfulness) within the team. In contrast, those who are highly

engaged may, from time-to-time, benefit from being given particularly challenging tasks with

resources and support that allow them to strengthen their sense of psychological availability.

Considering that line managers are key implementers of HRM practices (Alfes et al., 2013), it

is important that they understand the different needs and engagement levels of those they

manage day to day.

Overall, these implications provide some support for a contextually based approach to HRM

that highlights the resource-based, dynamic nature of the workplace and the importance of

context and embeddedness, although the impact of a contextualised, dynamic approach may

be relatively modest (as indicated by the relatively small effect sizes found in our study).

Despite this, our study highlights the potential value of adapting HRM practices to align with

the varied day-to-day working lives of beneficiaries. For example, practitioners should

consider how their activities and actions can make the recipients' daily work tasks clearer in

terms of purpose, their social support interactions in various work situations stronger, and

access to structural and environmental resources easier. HRM strategies focused on

facilitating engagement, such as performance improvement initiatives (Arrowsmith & Parker,

2013), communication strategies (Reissner & Pagan, 2013), and empowerment practices (van

de Voorde, Veld, & van Veldhoven, 2016), should consider the day-to-day nature of work

within general practices/policies and overall implementation stages rather than fundamentally

redesign interventions around particular types of events and situations.

Limitations

Even though the study verified the factor structures to test for common method bias, there

remains the issue of cross-sectionality. Longitudinal studies are needed, such as those that

separate the temporal sequence between predictors and outcomes. All of the quantitative

scales used were derived from between-person (i.e. 'trait' level) studies modified to reflect

the situation in question. Although this is common practice, future research should consider

how to assess situational perceptions more accurately by developing new measures.

Moreover, other well-established measures of psychological safety exist, for example

Edmondson's (1999) team psychological safety measure, which may encompass a broader

range of elements than Brown and Leigh's (1996) scale. Future research that examines the

construct of psychological safety in more depth, across different temporal levels, is needed.

Although we provide insight within the HRM domain regarding the contextual and temporal

dynamics of engagement, another avenue for future research is to connect the emerging

literature on the HRM approaches to 'practicing' engagement with the psychological research

on the 'experience' of engagement (Truss et al., 2013). For example, examining how

managerial strategies intended to promote 'engagement', such as communication activities

(Reissner & Pagan, 2014), empowerment-focused HRM (van de Voorde et al., 2016), and

performance improvement initiatives (Arrowsmith & Parker, 2014), influence the day-to-day

experience of personal role engagement. This would advance a more holistic understanding

of engagement that addresses HRM scholars' concerns about the translation of engagement

research to management practice (Purcell, 2014). We would therefore welcome action

research or experimental studies that examine the impact of engagement interventions on

'state' and 'trait' processes and outcomes of interest to HRM scholars, such as absenteeism or

performance. Of particular relevance would be interventions that incorporate activities, such

as job crafting or personal/team development, which act to influence the psychological

conditions of meaningfulness, availability and safety.

Conclusion

Our study addresses recent calls to examine how 'state' engagement fluctuates within the

working day, and to explore the potential moderating role of an individual's general 'trait'

level of engagement (Bakker, 2015; Ilies, Pluut et al., 2015). By focusing on discrete

situations within the workday, we showed broad support for two of Kahn's (1990)

psychological conditions, namely the role of meaningfulness and availability as critical for

'state' levels of personal role engagement and as core resources that connect perceptions of

the work context with such engagement. However, psychological safety was not found to be

as salient, which indicates that more research is needed to understand its potential impact.

Further, we revealed two effects of 'trait' engagement on 'state' engagement, such that when

'trait' engagement is high it may trigger a resource gain process (Salanova et al., 2010) that

harnesses the effects of psychological availability, whereas, when low, 'trait' engagement

may elicit a self-in-role calibration process (Kahn, 1990) that exploits the effects of

psychological meaningfulness. Overall, the findings advance a multilevel and context-

sensitive view of engagement that better aligns with, and tests, Kahn's (1990) seminal theorising and the temporal reality of organisational life. Furthermore, they highlight the need for HRM scholars and practitioners to consider the embedded and situated nature of resources within the work environment and how these influence motivational states.

References

Aguinis, H., Gottfredson, R. K., & Culpepper, S. A. (2013). Best-practice recommendations for estimating cross-level interaction effects using multilevel modeling. *Journal of Management*, *39*(6), 1490–1528. doi: 10.1177/0149206313478188

Alfes, K., Truss, C., Soane, E. C., Rees, C., & Gatenby, M. (2013). The relationship between line manager behavior, perceived HRM practices, and individual performance: Examining the mediating role of engagement. *Human Resource Management*, *52*(6), 839-859. Doi: 10.1002/hrm.21512

Amabile, T., & Kramer, S. (2011). The power of small wins. *Harvard Business Review*, May, 72–80.

Arrowsmith, J., & Parker, J. (2013). The meaning of 'employee engagement'for the values and roles of the HRM function. *The International Journal of Human Resource Management*, *24*(14), 2692-2712. doi: 10.1080/09585192.2013.763842

Bakker, A. B. (2014). Daily fluctuations in work engagement. *European Psychologist*, *19*(4), 227–236. doi: 10.1080/1359432X.2015.1071423

Bakker, A. B. (2015). Towards a multilevel approach of employee well- being. *European Journal of Work and Organizational Psychology*, *24*(6), 839–843. doi: 10.1080/1359432X.2015.1071423

Bakker, A. B., & Demerouti, E. (2008). Towards a model of work engagement. *Career Development International*, *13*(3), 209–223. doi: 10.1108/136204308108

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173–1182. doi: 10.1.1.169.4836

Becker, T. E. (2005). Potential problems in the statistical control of variables in organizational research: A qualitative analysis with recommendations. *Organizational Research Methods*, *8*(3), 274-289. doi: 10.1177/1094428105278021

Boxall, P., Guthrie, J. P., & Paauwe, J. (2016). Editorial introduction: Progressing our understanding of the mediating variables linking HRM, employee well-being and organisational performance. *Human Resource Management Journal*, *26*(2), 103-111. doi: 10.1111/1748-8583.12104

Brown, S. P., & Leigh, T. W. (1996). A new look at psychological climate and its relationship to job involvement, effort, and performance. *Journal of Applied Psychology*, *81*(4), 358–368. doi: 10.1037/0021-9010.81.4.358

Chen, Z., Zhang, X., & Vogel, D. (2011). Exploring the underlying processes between conflict and knowledge sharing: A work-engagement perspective. *Journal of Applied Social Psychology*, *41*(5), 1005–1033. doi: 10.1111/j.1559-1816.2011.00745.x

Clegg, C., & Spencer, C. (2007). A circular and dynamic model of the process of job design. *Journal of Occupational and Organizational Psychology*, *80*(2), 321-339. doi: 10.1348/096317906X113211

Cohn, M., & Fredrickson, B. L. (2006). Beyond the moment, beyond the self: Shared ground between selective investment theory and the broaden-and-build theory of positive emotions. *Psychological Inquiry*, *17*(1), 39–44. Retrieved from http://www.jstor.org/stable/20447297

Cole, M. S., Walter, F., Bedeian, A. G., & O'Boyle, E. H. (2012). Job burnout and employee

engagement: A meta-analytic examination of construct proliferation. *Journal of*

Management, *38*(5), 1550-1581.doi: 10.1177/0149206311415252

Conway, E., Fu, N., Monks, K., Alfes, K., & Bailey, C. (2016). Demands or resources? The

relationship between HR practices, employee engagement, and emotional exhaustion within a

hybrid model of employment relations. *Human Resource Management*, *55*(5), 901-917. doi:

10.1002/hrm.21691

Crawford, E., Rich, B., Buckman, B., & Bergeron, J. (2014). The antecedents and drivers of

employee engagement. In C. Truss, K. Alfes, R. Delbridge, A. Shantz, & E. C. Soane (Eds.),

Employee engagement in theory and practice (pp. 57–81). London: Routledge.

Edmondson, A. (1999). Psychological safety and learning behavior in work teams.

Administrative Science Quarterly, *44*(2), 350–383. doi: 10.2307/2666999

Fernet, C., Austin, S., Trépanier, S. G., & Dussault, M. (2013). How do job characteristics

contribute to burnout? Exploring the distinct mediating roles of perceived autonomy,

competence, and relatedness. *European Journal of Work and Organizational*

Psychology, *22*(2), 123-137. doi: 10.1080/1359432X.2011.632161

Fletcher, L. (2016). How can personal development lead to increased engagement? The roles

of meaningfulness and perceived line manager relations. *The International Journal of Human*

Resource Management. Online first. doi: 10.1080/09585192.2016.1184177

Fredrickson, B. L. (2001). The role of positive emotions in positive psychology. The

broaden-and-build theory of positive emotions. *American Psychologist*, *56*(3), 218–226. doi:

10.1037//0003-066X.56.3.218

Fredrickson, B. L., & Branigan, C. (2005). Positive emotions broaden the scope of attention

and thought-action repertoires. *Cognition & Emotion*, *19*(3), 313-332. doi:

10.1080/02699930441000238

Gillen, M., Baltz, D., Gassel, M., Kirsch, L., & Vaccaro, D. (2002). Perceived safety climate,

job demands, and coworker support among union and nonunion injured construction workers.

Journal of Safety Research, *33*(1), 33–51. doi: 10.1016/S0022-4375(02)00002-6

Halbesleben, J. R., Neveu, J. P., Paustian-Underdahl, S. C., & Westman, M. (2014). Getting

to the "COR" understanding the role of resources in conservation of resources

theory. *Journal of Management*, *40*(5), 1334-1364. doi: 10.1177/0149206314527130

Hobfoll, S. E. (2002). Social and psychological resources and adaptation. *Review of General

Psychology*, *6*(4), 307–324. doi: 10.1037/1089-2680.6.4.307

Ilies, R., Aw, S. S. Y., & Pluut, H. (2015). Intraindividual models of employee well-being :

What have we learned and where do we go from here ? *European Journal of Work and

Organizational Psychology*, *24*(6), 827–838. doi: 10.1080/1359432X.2015.1071422

Ilies, R., Pluut, H., & Aw, S. S. Y. (2015). Studying employee well-being: Moving forward.

European Journal of Work and Organizational Psychology, *24*(6), 848–852. doi:

10.1080/1359432X.2015.1080241

Jenkins, S., & Delbridge, R. (2013). Context matters: Examining 'soft'and 'hard'approaches

to employee engagement in two workplaces. *The International Journal of Human Resource

Management*, *24*(14), 2670-2691. doi: 10.1080/09585192.2013.770780

Kahn, W. A. (1990). Psychological conditions of personal engagement and disengagement at

work. *Academy of Management Journal*, *33*(4), 692–724. doi:10.2307/256287

Kahn, W. A., & Heaphy, E. D. (2014). Relational contexts of personal engagement at work. In C. Truss, K. Alfes, R. Delbridge, A. Shantz, & E. C. Soane (Eds.), *Employee engagement in theory and practice* (pp. 82–96). London: Routledge.

Langford, P. H. (2009). Measuring organisational climate and employee engagement: Evidence for a 7 Ps model of work practices and outcomes. *Australian Journal of Psychology*, *61*(4), 185–198. doi: 10.1080/00049530802579481

May, D. R., Gilson, R. L., & Harter, L. M. (2004). The psychological conditions of meaningfulness, safety and availability and the engagement of the human spirit at work. *Journal of Occupational and Organizational Psychology*, *77*(1), 11–37. doi: 10.1348/096317904322915892

Preacher, K., Curran, P. J., & Bauer, D. J. (2006). Computational tools for probing interactions in multiple linear regression, multilevel modeling, and latent curve analysis. *Journal of Educational and Behavioral Statistics*, *31*(4), 437–448. doi: 10.3102/10769986031004437

Preacher, K. J., & Kelley, K. (2011). Effect size measures for mediation models: quantitative strategies for communicating indirect effects. *Psychological Methods*, *16*(2), 93–115. doi: 10.1037/a0022658

Purcell, J. (2014). Disengaging from engagement. *Human Resource Management Journal*, *24*(3), 241–254. doi: 10.1111/1748-8583.12046

Rashbash, J., Steele, F., Browne, W., & Goldstein, H. (2012). *A user's guide to MLwiN Version 2.26*. Bristol, UK: Centre for Multilevel Modelling, University of Bristol.

Reissner, S., & Pagan, V. (2013). Generating employee engagement in a public–private partnership: management communication activities and employee experiences. *The*

International Journal of Human Resource Management, *24*(14), 2741-2759. doi:10.1080/09585192.2013.765497

Rich, B. L., Lepine, J. A., & Crawford, E. R. (2010). Job engagement: antecedents and effects on job performance. *Academy of Management Journal*, *53*(3), 617–635. doi: 10.5465/AMJ.2010.51468988

Roe, R. ., & Inceoglu, I. (2016). Measuring states and traits in motivation and emotion: A new model illustrated for the case of work engagement. In F. T. L. Leong, D. Bartram, F. M. Cheung, K. F. Geisinger, & D. Iliescu (Eds.), *The ITC international handbook of testing and assessment* (pp. 63–88). Oxford: Oxford University Press.

Saks, A. M., & Gruman, J. A. (2014). What do we really know about employee engagement? *Human Resource Development Quarterly*, *25*(2), 155–182. doi: 10.1002/hrdq.21187

Salanova, M., Schaufeli, W. B., Xanthopoulou, D., & Bakker, A. B. (2010). The gain spiral of resources and work engagement: Sustaining a positive worklife. In A. B. Bakker & M. P. Leiter (Eds.), *Work engagement: A handbook of essential theory and research* (pp. 118–131). Hove, UK: Psychology Press.

Schaufeli, W. B., Salanova, M., Gonzalez-roma, V. A., & Bakker, A. B. (2002). The measurement of engagement and burnout: A two sample confirmatory factor analytic approach. *Journal of Happiness Studies*, *3*(1), 71–92. doi: 10.1023/A:1015630930326

Selig, J. P., & Preacher, K. J. (2008*). Monte Carlo method for assessing mediation: An interaction tool for creating confidence intervals for indirect effects*. [online software]: http://quantpsy.org.

Sheldon, K. M., Ryan, R., & Reis, H. T. (1996). What makes for a good day? Competence and autonomy in the day and in the person. *Personality and Social Psychology Bulletin*, *22*(12), 1270–1279. doi: 10.1177/01461672962212007

Shen, J., Messersmith, J. G., & Jiang, K. (2017). Advancing human resource management scholarship through multilevel modeling. *The International Journal of Human Resource Management*, online first publication. doi: 10.1080/09585192.2017.1331622

Soane, E., Shantz, A., Alfes, K., Truss, C., Rees, C., & Gatenby, M. (2013). The association of meaningfulness, well-being, and engagement with absenteeism: A moderated mediation model. *Human Resource Management*, *52*(3), 441–456. doi: 10.1002/hrm.21534

Spreitzer, G. M. (1995). Psychological empowerment in the workplace: dimensions, measurement and validation. *Academy of Management Journal*, *38*(5), 1442–1465. doi: 10.2307/256865

Truss, C., Shantz, A., Soane, E., Alfes, K., & Delbridge, R. (2013). Employee engagement, organisational performance and individual well-being: exploring the evidence, developing the theory. *The International Journal of Human Resource Management*, *24*(14), 2657–2669. doi: 10.1080/09585192.2013.798921

Van De Voorde, K., Veld, M., & Van Veldhoven, M. (2016). Connecting empowerment-focused HRM and labour productivity to work engagement: The mediating role of job demands and resources. *Human Resource Management Journal*, *26*(2), 192-210.doi: 10.1111/1748-8583.12099

Xanthopoulou, D., Bakker, A. B., Demerouti, E., & Schaufeli, W. B. (2009). Work engagement and financial returns: A diary study on the role of job and personal resources. *Journal of Occupational and Organizational Psychology*, *82*(1), 183–200. doi: 10.1348/096317908X285633

Zohar, D., Tzischinski, O., & Epstein, R. (2003). Effects of energy availability on immediate and delayed emotional reactions to work events. *Journal of Applied Psychology*, *88*(6), 1082–1093. doi: 10.1037/0021-9010.88.6.1082

Table 1. Means, standard deviations, and correlations

Variable	Mean	Between-person SD	Within-person SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Public sector organisations				-															
2. Gender				-.06	-														
3. Age	39.26	11.43		.28	.14	-													
4. Tenure	9.06	7.85		.22	.14	.47	-												
5. Management responsibility				-.15	-.05	.21	.32	-											
6. 'Trait' personal role engagement	5.94	0.63		.04	.31	.05	.04	.17	-										
7. Type of situation (most/least)										-	.00	.00	.23	.22	.20	.28	.34	.31	.42
8. Time (days)	9.55	3.61	8.19	.04	.11	.00	.10	.00	-.15		-	-.08	-.05	.00	.05	-.01	-.06	-.04	-.05
9. Good/bad day effect	5.38	0.82	1.31	.06	.17	-.01	.02	-.01	.50		-.14	-	.35	.33	.26	.29	.41	.33	.36
10. Task clarity	5.58	0.64	0.94	.07	.15	-.05	-.01	.10	.41		-.05	.53	-	.59	.50	.46	.54	.41	.53
11. Access to resources	5.16	0.77	1.18	.00	.02	-.07	.00	.07	.23		-.18	.58	.51	-	.45	.34	.52	.42	.41
12. Co-worker support	5.10	0.66	1.08	-.04	.12	-.12	.04	.06	.24		-.07	.39	.36	.36	-	.33	.40	.34	.42
13. Meaningfulness	4.72	0.98	1.44	.18	.18	.15	.21	.19	.66		-.20	.45	.56	.40	.41	-	.37	.30	.68
14. Availability	5.58	0.52	1.01	.04	.00	-.07	-.03	.09	.26		-.14	.55	.63	.66	.50	.34	-	.59	.53
15. Safety	4.96	0.79	1.28	-.18	.18	-.04	-.03	.13	.30		-.19	.49	.50	.50	.30	.30	.63	-	.42
16. 'State' personal role engagement	5.24	0.71	1.09	.04	.20	.01	.07	.15	.72		-.27	.53	.62	.47	.54	.84	.50	.43	-

Note: Above diagonal are within-person correlations ($p < .05 + / .05$) where variables are not centred. Below diagonal are between-person correlations ($p < .05$ +/- .18). To attain values for the within-person variables at the between-person level, the scores were aggregated (i.e. averaged) on participant

Table 2. Multilevel analyses for predicting 'state' personal role engagement and the psychological conditions

	Predicting 'state' personal role engagement				Predicting situational psychological conditions		
	Model 1	Model 2a	Model 2b	Model 3	Meaningfulness	Availability	Safety
Independent variables	Est.(SE)	Est.(SE)	Est. (SE)	Est. (SE)	Est.(SE)	Est. (SE)	Est. (SE)
Time (days)	0.004 (0.002)*	0.003 (0.002)	0.001 (0.002)	0.001 (0.002)	0.010 (0.003)***	-0.002 (0.002)	-0.003 (0.003)
Public sector organisations	-0.031 (0.092)	-0.032 (0.091)	-0.032 (0.091)	-0.032 (0.091)	0.111 (0.139)	-0.032 (0.106)	-0.485 (0.138)***
Gender	-0.030 (0.095)	-0.029 (0.097)	-0.027 (0.094)	-0.027 (0.094)	-0.111 (0.144)	-0.082 (0.109)	0.261 (0.143)
Tenure	0.004 (0.006)	0.004 (0.006)	0.004 (0.006)	0.004 (0.006)	0.021 (0.009)*	-0.003 (0.007)	-0.005 (0.009)
Management responsibility	0.022 (0.096)	0.022 (0.098)	0.022 (0.095)	0.022 (0.095)	0.060 (0.145)	0.057 (0.110)	0.123 (0.144)
'Trait' personal role engagement	0.784 (0.073)***	0.783 (0.073)***	0.780 (0.073)***	0.780 (0.072)***	1.056 (0.111)***	0.249 (0.084)**	0.306 (0.110)**
Good/bad day effect	0.211 (0.018)***	0.139 (0.018)***	0.090 (0.017)***	0.080 (0.017)***	0.093 (0.026)***	0.169 (0.018)***	0.128 (0.024)***
Type of situation (most/least)	0.920 (0.037)***	0.710 (0.038)***	0.506 (0.038)***	0.481 (0.038)***	0.579 (0.054)***	0.412 (0.038)***	0.531 (0.050)***
Task clarity		0.284 (0.029)***		0.136 (0.029)***	0.332 (0.042)***	0.316 (0.029)***	0.171 (0.039)***
Access to resources		0.067 (0.022)**		0.016 (0.021)	0.070 (0.031)*	0.158 (0.022)***	0.185 (0.029)***
Co-worker support		0.119 (0.022)***		0.063 (0.021)**	0.118 (0.032)***	0.126 (0.022)***	0.221 (0.029)***
Meaningfulness			0.261 (0.017)***	0.235 (0.018)***			
Availability			0.270 (0.026)***	0.216 (0.027)***			
Safety			0.022 (0.020)	0.006 (0.020)			
Between-person variance	0.184	0.188	0.192	0.193	0.448	0.264	0.451
Within-person variance	0.495	0.431	0.370	0.360	0.886	0.429	0.761
-2*loglikelihood	3295.066	3111.584	2909.106	2871.976	4166.971	3139.909	3965.106
Δ-2*loglikelihood	685.530***	183.482***	385.96***	239.608***	464.126***	737.075***	508.543***

*$p < .05$; ** $p < .01$; *** $p < .001$
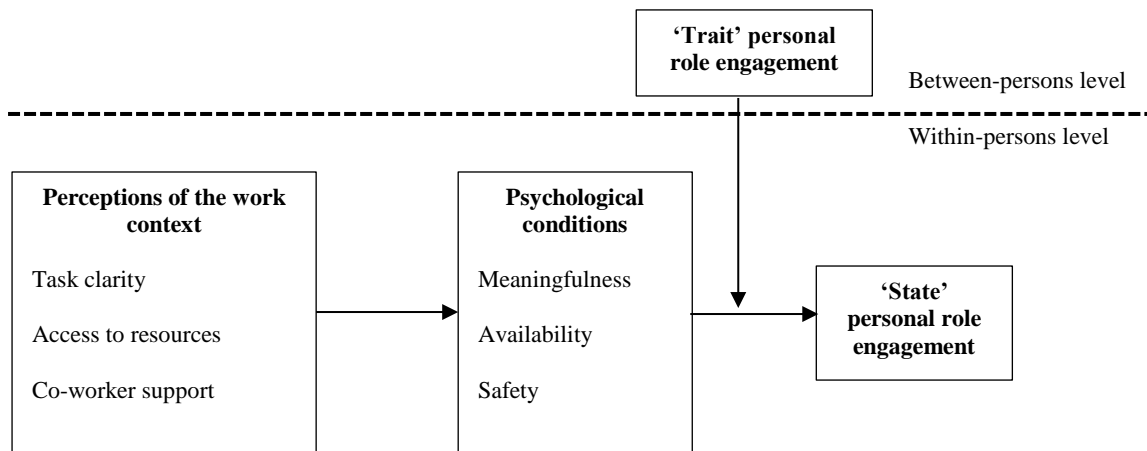
Table 3. MCMAM tests on the indirect effects

Indirect effect	*ab*	Lower bound	Upper bound	Effect Size
Meaningfulness as mediator				
Task clarity	0.078	0.054	0.105	0.068
Access to resources	0.016	0.002	0.033	0.018
Co-worker support	0.028	0.013	0.046	0.027
Availability as mediator				
Task clarity	0.068	0.046	0.093	0.059
Access to resources	0.034	0.019	0.053	0.037
Co-worker support	0.027	0.013	0.044	0.027
Safety as mediator				
Task clarity	0.001	-0.010	0.012	0.001
Access to resources	0.001	-0.011	0.013	0.001
Co-worker support	0.001	-0.013	0.015	0.001

Table 4. Multilevel models testing cross-level moderation effects on 'state' personal role engagement

| | Model 1 | Model 2 | Model 3 | Model 4 |
	Est. (SE)	Est. (SE)	Est. (SE)	Est. (SE)
Within-person predictors				
Time (days)	0.002 (0.002)	0.003 (0.002)	0.003 (0.002)	0.003 (0.002)
Good/bad day effect	0.080 (0.017)***	0.067 (0.017)***	0.068 (0.017)***	0.068 (0.017)***
Type of situation	0.482 (0.038)***	0.475 (0.036)***	0.478 (0.036)***	0.477 (0.036)***
Task clarity	0.137 (0.029)***	0.144 (0.028)***	0.136 (0.028)***	0.138 (0.028)***
Access to resources	0.015 (0.021)	0.011 (0.020)	0.008 (0.020)	0.009 (0.020)
Co-worker support	0.062 (0.021)**	0.056 (0.021)**	0.054 (0.021)**	0.054 (0.021)**
Meaningfulness	0.234 (0.018)***	0.229 (0.021)***	0.233 (0.021)***	0.231 (0.021)***
Availability	0.217 (0.027)***	0.218 (0.036)***	0.213 (0.037)***	0.212 (0.035)***
Safety	0.006 (0.020)	-0.004 (0.026)	-0.005 (0.027)	-0.009 (0.026)
Between-person predictors				
Public sector			-0.007 (0.087)	-0.011 (0.087)
Gender			-0.022 (0.090)	-0.024 (0.090)
Tenure			0.007 (0.006)	0.007 (0.006)
Management responsibility			-0.008 (0.091)	-0.008 (0.091)
'Trait' personal role engagement			0.785 (0.069)***	0.781 (0.072)***
Cross-level interactions				
'Trait' personal role engagement x meaningfulness				-0.071 (0.031)*
'Trait' personal role engagement x availability				0.133 (0.050)**
'Trait' personal role engagement x safety				0.003 (0.040)
Between-person variance	0.432	0.437	0.198	0.198
Within-person variance	0.360	0.296	0.295	0.295
-2*loglikelihood	2961.930	2872.569	2781.023	2770.826
Δ-2*loglikelihood	1018.666***	89.361***	91.546***	10.197*

*$p < .05$; ** $p < .01$; *** $p < .001$

Figure 1. Illustration of the theoretical model

Note: The mediators shown above (i.e. psychological conditions) are tested simultaneously within one model, which also reduces multicollinearity.

Figure 2. Cross-level interaction of 'trait' engagement and availability on 'state' engagement
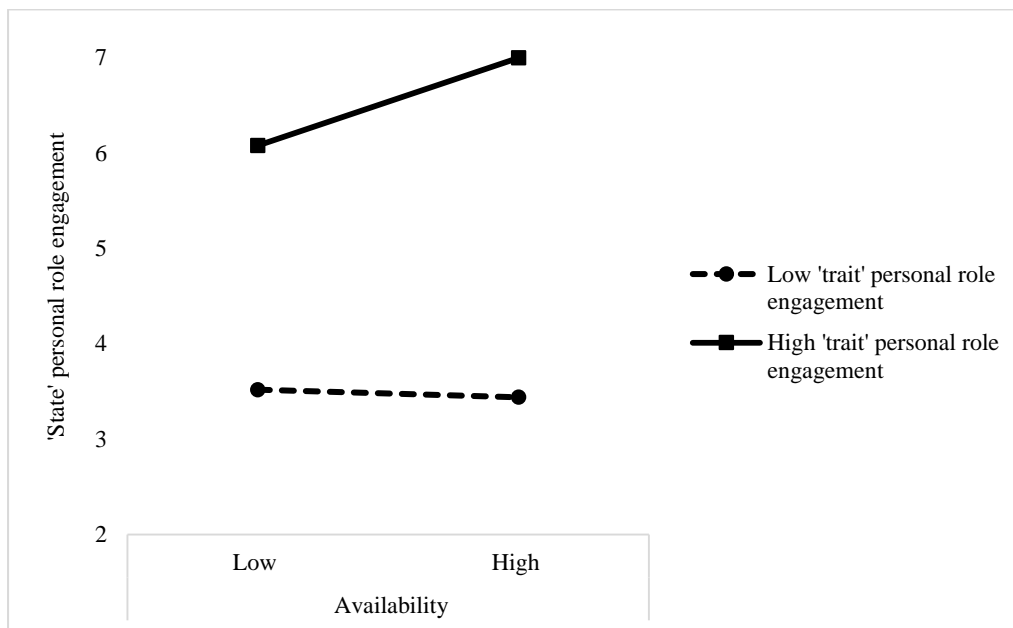
Figure 3. Cross-level interaction of 'trait' engagement and meaningfulness on 'state' engagement