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The work engagement–performance link: an episodic perspective

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Abstract

Purpose – The purpose of this paper is to integrate job demands–resources theory and the episodic process model to examine the relationships between episodic cognitive mechanisms (i.e. cognitive interference and attentional pull), work engagement and performance. It is hypothesized that an episode characterized by less cognitive interference and more attentional pull (i.e. attraction toward the work activity) is associated with the highest levels of work engagement and job performance. Additionally, it is hypothesized that episodic challenge/hindrance job demands boost/diminish the positive relationship between episodic job resources and work engagement.

Design/methodology/approach – Using experience sampling methodology, 48 employees used their smartphones to complete surveys three times a day for one week, resulting in 266 observations.

Findings – Results of multilevel analyses suggest that episodic hindrance job demands (but not challenge job demands) moderate the positive relation between job resources and work engagement.

Originality/value – This study is unique in that it captures fluctuating cognitive processes (i.e. attentional pull and cognitive interference) that take place during work activities.

Keywords Attentional pull, Episodic process model, Episodic work engagement, Job demands–resources theory

Paper type Research paper

Introduction

Few people will doubt that successful performance during a specific work activity requires that people focus all their attention on the execution of that activity. The episodic process model (EPM) (Beal *et al.*, 2005; Weiss *et al.*, 2004) provides a framework that explains how employees who generally perform well have instances of poor performance due to inadequate attention regulation. Accordingly, people's attention can drift away from a specific work activity by mental distractions (i.e. cognitive interference) (Sarason *et al.*, 1986). However, people may also experience task attentional pull toward a work activity due to the appealing nature of the work (Beal *et al.*, 2005).

Using a fine-grained experience sampling (ESM) approach, we examine whether experiencing attentional pull toward a work activity relates to higher work engagement – a positive, fulfilling state of mind characterized by vigor, dedication and absorption (Schaufeli *et al.*, 2006). Additionally, we investigate the extent to which cognitive interference relates to lower episodic work engagement and episodic performance.

Job demands–resources (JD–R) theory proposes that job demands and resources interact in predicting work engagement (Bakker and Demerouti, 2014). Specifically, the theory outlines that job resources are particularly motivating and related to work engagement when challenges are high (vs low), and when hindrances are low (vs high). There is some empirical evidence supporting these premises (Bakker and Sanz-Vergel, 2013; Tadić *et al.*, 2015), but very limited evidence using fine-grained diary approaches (Reina-Tamayo *et al.*, 2017).

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The present study aims to test this proposition at the performance episode level (i.e. during each work activity).

Our study makes a number of contributions: first, we test a central proposition in the EPM and examine how episodic work engagement and job performance fluctuate synchronously from activity to activity as a function of concurrent appraisals of attentional pull and cognitive interference (Beal *et al.*, 2005). Second, following the EPM proposition that job performance is episodic, we test the JD–R premises at the episode level in a day-care setting. Specifically, we study whether job resources present in a work activity relate to higher episodic work engagement, particularly, in combination with challenge job demands as opposed to hindrance job demands (Bakker and Demerouti, 2014). In terms of practical implications for individual career development, this study informs employees about the importance of learning how to utilize their resources in order to deal with the acute demands they experience during a work activity.

Third, the choice of an experience sampling study enabled us to observe how someone who is generally engaged at work, experiences "off-moments" characterized by low episodic work engagement during a specific work activity. The benefit of this study's design is that it investigates episodic fluctuations as opposed to general experiences – enabling us to test whether variations in situational job characteristics and cognitive transient states result in immediate fluctuations in employee's engagement and performance (Ilies *et al.*, 2007). In addition, this fine-grained approach gives us more insight into the specific drivers of engagement of a person at the activity level. Overall, to get a better understanding of the process that explains episodic job performance, we derived from the EPM (Beal *et al.*, 2005) how performance may differ from one performance episode to the next contingent on attentional processes that influence attentional focus (e.g. cognitive interference and attentional pull). Additionally, we examine how task features (i.e. episodic job demands and job resources) adopted from JD–R theory (Bakker and Demerouti, 2014) can explain between-episode variability in performance through work engagement. In sum, based on an integration of JD–R theory and EPM, we test a mediation model in which episodic job resources, demands, attentional pull and cognitive interference relate to episodic performance through episodic work engagement (Beal *et al.*, 2005; see Figure 1). Thus, the episodic perspective adds a more experiential understanding of how performance may change within one person depending on the task the employee is involved in at the very moment. Our approach complements the between-person perspective on how employee performance in general differs between individuals.

Theoretical background

According to JD–R theory (Bakker and Demerouti, 2014), job demands and job resources – which are physical, psychological, social or organizational characteristics of the job – have an independent and combined relation with work engagement (Bakker *et al.*, 2007; Tadić *et al.*, 2015).

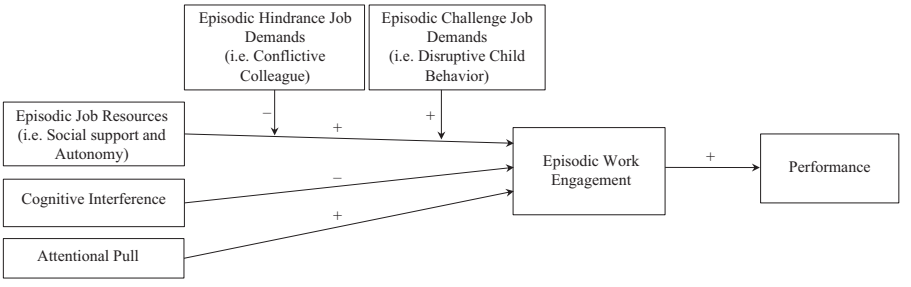

Figure 1.
Hypothesized model of episodic work engagement

Whereas job demands require sustained psychological and physiological effort and result in energetic costs, job resources promote personal growth and development, and help employees achieve their work goals.

Moreover, JD–R theory states that every work environment has unique demands and resources. Based on this proposition, we contacted a few day-care teachers to inquire about the most relevant demands and resources they faced at work. Specifically, we approached three day-care teachers from three different day-care institutions in the Netherlands, and asked them how a typical workday was organized and how the different activities and tasks were normally performed. The teachers were also asked what aspects of their work made them more vs less motivated at work. This resulted in a better understanding about which demands and resources are particularly relevant for day-care teachers. These dialogs revealed colleague support and autonomy are the most salient resources while social conflict and disruptive child behavior (DCB) are their most relevant demands. Specifically, teachers experience social conflict as a hindering demand. Social conflict refers to expressions of negative affect and disconfirmation (Abbey *et al.*, 1985). Furthermore, teachers identify DCB as a challenge demand. DCB refers to demanding behaviors children may show such as crying, being restless or hitting other children (Behar, 1977). Teachers felt challenged to make the children happy and calm after they exhibit DCB.

JD–R theory and EPM

In the present study, we propose that the motivational process proposed by JD–R theory may also become apparent at the episodic level. Theoretically, we refer to the EPM (Weiss *et al.*, 2004) to explain the episodic fluctuations in job demands and job resources. This model proposes that people's experience of a working day is organized around performance episodes that have a coherent thematic organization around work-related goals. We propose that as these goals change, the work activities employees perform change along with the number of job resources and demands around the activity (Sonnentag, 2017). The following examples illustrate how job demands and resources educators face may differ from episode to episode. When children exhibit high DCB, such as screaming and crying, the employee's attention is constrained to this event. In addition, employees' interactions with co-workers might be supportive and pleasant on one instance and less supportive or even demanding on another instance.

Job resources, such as a colleague's support and job autonomy, should trigger an intrinsic motivational process during a performance episode by satisfying basic human needs of relatedness, autonomy and competence (Gagné and Deci, 2005; Sonnentag, 2017). Moreover, in a specific activity, an extrinsic motivational process should be triggered when employees have a supportive colleague to whom they can ask for help when needed (Xanthopoulou *et al.*, 2008). The extrinsic and intrinsic motivational process should foster the employee's willingness to invest effort and enthusiasm during a work activity (i.e. episodic work engagement).

Daniels *et al.*'s (2013) experience sampling study provides empirical support for the dynamic nature of job characteristics. The study revealed that employees who used colleague support and job control to solve problems during specific work hours showed less cognitive failure, fatigue and negative affect. Furthermore, in support of JD–R theory, Xanthopoulou *et al.*'s (2008) diary study with flight attendants showed that fluctuations in colleague support across intercontinental flights were positively related to daily self-efficacy and work engagement. Therefore, based on previous research (Reina-Tamayo *et al.*, 2017), we argue that in work activities where there are more episodic job resources available, employees will experience more work engagement:

H1a. Episodic job resources relate positively to episodic work engagement.

Furthermore, JD–R theory claims that job demands interact with job resources to predict employee well-being. The nature of this interaction may depend on the type of demands the

employees are encountering. According to the challenge-hindrance stressor framework (Cavanaugh *et al.*, 2000), demands can be categorized as challenge or hindrance demands. Challenge demands are defined as aspects of the job that cost effort and energy, but also provide fulfillment and opportunities for growth. Examples of challenge demands are workload, time urgency and job complexity. Hindrance demands are defined as aspects of the job that cost energy and evoke stress, but additionally constrain the individual interfering with person's ability to achieve goals. Examples of such demands in organizations are red tape, hassles or role conflict. Previous empirical studies have shown that when workers confront hindrance job demands, they experience negative work outcomes (Crawford *et al.*, 2010), such as lower work engagement (Tadić *et al.*, 2015), and impaired job satisfaction (Cavanaugh *et al.*, 2000).

In our study, we investigate whether episodic hindrance job demands that employees confront during a work activity undermine the association between job resources and work engagement. In addition, JD–R theory claims that job resources have a positive influence on work engagement, especially when challenge job demands are high. Applied to our study, employees may use job resources to transform stress (potential energy) triggered by challenge job demands into motivational energy, which should result in episodic work engagement (Bakker and Sanz-Vergel, 2013; Kühnel *et al.,* 2012; Tadić *et al.*, 2015). Breevaart and Bakker (2018) showed that on days employees faced high challenge demands, daily transformational leadership maintained employees' engagement, while on days that employees faced high hindrance, daily transformational leadership protected employee engagement levels. We extend this research to the episodic level, and make the following predictions:

H1b. The positive relationship between episodic job resources and episodic work engagement is stronger when episodic challenge job demands are high (vs low).

H1c. The positive relationship between episodic job resources and episodic work engagement is weaker when episodic hindrance job demands are high (vs low).

Task attentional pull

The EPM outlines how cognitive processes during work activities are theoretically related to job performance. Specifically, Beal *et al.* (2005) postulate that in order for employees to perform well, their attention needs to be fully focused on the task. Task attentional pull refers to characteristics of the focal task (e.g. the intrinsic interest in the task, or the difficulty of the task goal) that draw a person's attention toward it, facilitating the self-regulation of attention toward it (Weiss *et al.*, 2004). In our study, we focus on the phenomenological experience of task attentional pull, that is, of experiencing one's attention being drawn to the core activity of the performance episode.

In order to exemplify the conceptualization of attentional pull, we refer to the literature on visual spatial attention that examines the phenomenon of attentional capture (Ruz and Lupiáñez, 2002). Bottom-up attentional capture is an unintentional, rapid and automatic process that directs a person's attention toward a stimulus (Varela *et al.*, 2014). The intensity of this form of attentional capture depends on the characteristics of the stimulus (e.g. color or size). In a similar way, Beal *et al.* (2005) state that task attentional pull is a bottom-up process that is unintentional and draws a person's attention to the task.

Furthermore, we argue that task attentional pull is conceptually different from episodic work engagement. Attentional pull refers to the experience of having one's attention drawn toward the work activity (Beal *et al.*, 2005). In contrast, work engagement refers to the actual focusing of attention on the work activity (Schaufeli *et al.*, 2006). Varela *et al.*'s (2014) study exemplifies this distinction. They examined the attentional capture of cereal package features when consumers were evaluating similarities and differences among packages. They found

that product name, image and brand were the features with highest attentional capture; hence inferring that attentional capture is a cognitive process that explains why consumers give full attention to the package features. Accordingly, we argue that task attentional pull, like attentional capture, is a cognitive process that facilitates episodic work engagement:

H2a. Attentional pull during a performance episode is positively related to episodic work engagement.

Cognitive interference

Beal *et al.* (2005) proposed that off-task attentional demands may also influence performance by diverting an employee's attention off-task. A representation of such diversion of attention is cognitive interference, which is defined as thinking about past activities or personal worries that disrupt an employee's concentration (Sarason *et al.*, 1986). When employees experience cognitive interference, they are unable to allocate all the necessary cognitive resources to the activity at hand, preventing the employee from achieving optimal performance (Dolcos, 2006; Hopstaken *et al.*, 2016; Kurosawa and Harackiewicz, 1995). McCarthy *et al.* (2013) conducted survey studies to examine the relation between affect, cognitive interference, concentration and performance in young athletes after a competition. They found that cognitive interference was negatively related with concentration and performance in the competition.

In a similar way, we expect that having interfering thoughts while performing a work activity can be negatively associated with the concentration of day-care teachers. If, during a performance episode, an employee is teaching a crafting lesson, but worrying about an earlier event, this worrying thought will divert the person's attention from the primary activity (i.e. teaching the lesson). Therefore, we hypothesize:

H2b. Cognitive interference during a performance episode is negatively related to episodic work engagement.

The mediating role of episodic work engagement

Several studies using the JD–R framework have shown that work engagement at the general, day and week level is associated with performance at the respective levels (Xanthopoulou and Bakker, 2013). Following the EPM proposition that performance is better the more attentional and energetic resources are dedicated to the activity at hand, we can expect that there will be a positive relation between performance and engagement at the episodic level. Hence, it is important to examine the extent to which episodic engagement relates to episodic performance throughout different work activities.

A recent eye tracking lab study showed that intermediate pupil diameter, which reflects task engagement, is positively associated with performance in a visual letter *n*-back task (Hopstaken *et al.*, 2016). Additionally, a research study on student task engagement showed that students who were actively engaged while solving matching problems had better performance on that task than students who were passively engaged (Ota and DuPaul, 2002). In sum, few studies have shown that engagement and performance are related at the activity level; nevertheless, empirical evidence is still lacking for the relation between work engagement and performance at the activity level in a real organizational setting. Thus, in order to test the ecological validity of the episodic work engagement–performance link, we will examine this relation in a day-care setting. We propose that engaged employees will achieve higher performance during a work activity by using all the energy, dedication and absorption experienced during that episode to channel their effort toward high-quality episodic performance:

H3. Episodic work engagement mediates the relationship between (a) episodic resources, demands, attentional pull and cognitive interference and (b) episodic performance.

Method

Procedure

Researchers residing in the Netherlands and Iceland recruited participants by creating a database with facility managers' contact information from childcare websites from these two countries. Then, we contacted managers by e-mail advertising, telephone, and in person during May and June of 2015. These managers then encouraged the day-care teachers in their facility to sign up for the study by filling out a registration form. The study was advertised as a smartphone app research project about momentary work engagement. Hence, a pre-condition to joining the study was that participants had a smartphone device and access to the internet in their place of employment. For the Icelandic/Dutch sample, we translated the scales that were not originally in Icelandic/Dutch from English to Icelandic/Dutch and had them back translated to English by native Icelandic/Dutch speakers. Respondents participated voluntarily and received no compensation.

We used an Android/iPhone smartphone app (MetricWire) to implement the ESM. ESM requires participants to answer brief questionnaires at different times of the day in order to capture information about their daily activities, context and subjective experiences without retrospective bias (Hektner *et al.*, 2007). Participants installed the MetricWire app on their smartphones to have mobile access to the research brief questionnaires.

After participants completed the registration form that asked for an e-mail address, they received an e-mail with detailed instructions on how to create a personalized account using their e-mail address. The personalized account provided a unique ID to each participant, which allowed multiple responses to be linked. Data collection proceeded for two weeks. Participants started the research after reading and approving an online consent form indicating their voluntary and confidential participation. Participants had one week to complete a general survey and to download and install the MetricWire app on their smartphone device.

In the second week, participants received, via the smartphone app, three alerts during the day at pre-designated times – at 10:30 a.m., 1:00 p.m. and 3:00 p.m. – for five consecutive working days. The times were decided after consultation with the employees, so the alerts were not received in hectic hours, such as when the children arrive at the day-care facility. After the participants received an alert on their smartphone, they were able to tap the alert and were re-directed to the app that enabled them to answer a brief survey. Participants could respond to the questionnaire anytime within 1 h after receiving the alert. Once the hour had passed, the brief questionnaire was not accessible anymore. The survey asked participants to answer questions about the activity they were doing just before receiving the alert. We asked the participants who did not work Monday through Friday to continue the study until five workdays were completed.

Participants

A total of 87 individuals signed up to participate and received e-mailed instructions. Of these, 58 completed the general survey (66 percent), and 48 completed the experience sampling surveys three times a day for five working days, yielding a response rate of 55 percent. We obtained 558 usable episodic responses of a possible 765 responses (73 percent response rate). However, some participants were not able to answer the question about DCB because they were not with the children at all the times. At times, they were doing administrative work or cleaning around. This reduced the sample size to 438 observations. In addition, we controlled for the previous moment episodic engagement ($t-1$) and previous moment episodic performance ($t-1$). After this adjustment in our analysis, our sample size was reduced to 266 observations. In this subsample, participants completed an average of 5.54 (SD $= 1.87$) episodic surveys.

Our convenience sample consisted of 48 early childhood educators who worked in childcare facilities in the Netherlands (31 percent) and Iceland (69 percent). The employees worked an average of 36.2 h per week (SD = 8.81) with 39 percent of the participants working part-time. Participants had a mean age of 33.79 years (SD = 9.09). Participants were mainly women (92 percent). In total, 16 percent of the participants were living with a partner and 50 percent of the participants had children. In total, 33 percent of the participants had attended community college and 58 percent had obtained a bachelors' degree. The employees worked primarily with children aged 0–2 years (23 percent), 2–4 years (42 percent) and 5–6 years (29 percent). In total, 73 percent of the employees had a permanent contract and 27 percent had a temporary contract.

Measures

General measure. In order to assess the convergent validity of our episodic work engagement measure, we added a path between person-level work engagement and the aggregated episodic work engagement measure in the hypothesized model.

Work engagement. We used the Utrecht Work Engagement Scale (UWES) (Schaufeli *et al.*, 2006) to measure employee's engagement levels. The nine-item UWES had three items for each of the three dimensions of work engagement. Sample items were, "I feel strong and vigorous in my work" (vigor), "I am enthusiastic about my job" (dedication) and "I get carried away by my work" (absorption). Participants answered the items on a seven-point frequency rating scale (0 = never, 6 = always). The reliability of the scale was good, Cronbach's $\alpha = 0.81$.

Experience sampling assessments. Ohly *et al.* (2010) recommend using abbreviated scales when conducting diary studies to reduce the burden on the participants. This is a common procedure, where scholars reduce the number of items per scale by selecting items with the highest item-total correlations from a multi-item scale (Ohly *et al.*, 2010). We implemented this procedure to operationalize each episodic level construct. In order to apply this practice, we selected three items that showed a high factor loading or item-total correlation from each multi-item scale that were presented in validation studies of the respective questionnaire. In addition to considering the highest item-total correlations, we ensured that the items were applicable to a dynamic context and were relevant to a day-care work settings. We adapted the period of the scales, so the questions could be answered in reference to the activity they were doing just before they were signaled by the app. All items were scored on a seven-point scale (1 = not at all, 7 = very much), except for performance (see below).

Episodic activities. First, we asked the participants an open-ended question about the activity they were doing (i.e. "What activity were you doing?"). In addition, we had one question about the accompanying person for this activity (i.e. "Select with whom were you doing the activity").

Episodic work engagement. We measured episodic work engagement with three items from the UWES (Schaufeli *et al.*, 2006) to represent each of its three dimensions, that was, vigor ("During this activity, I felt that I was bursting with energy"), dedication ("During this activity, I was enthusiastic about what I was doing") and absorption ("During this activity, I was immersed in my work"). The average Cronbach's α across the measurement occasions for this scale was $\overline{\alpha} = 0.84$.

Episodic resources. Social support was measured with three items from the Questionnaire on the Experience and Evaluation of Work (Van Veldhoven and Meijman, 1994): "Could you ask your colleagues for help when necessary during this activity?", "Could you count on your colleagues for support when the work activity was difficult?", and "Did you feel appreciated by your colleagues during this activity?" The average Cronbach's α for this scale was $\overline{\alpha} = 0.78$. Job autonomy was measured with three items from the validated

Dutch version of the Job Diagnostic Survey (Valkeneers *et al.*, 2011): "During this activity, I had the opportunity to decide independently how I performed my job", "During this activity, I had a lot of room to make my own decisions", and "How much autonomy did you have during this activity?" ($\overline{\alpha} = 0.91$). The average Cronbach's α for the episodic job resources scale was $\overline{\alpha} = 0.85$.

Episodic challenge job demands. DCB was measured with three items from the Preschool Behavior Questionnaire (Behar, 1977). One item was used to represent each of its three dimensions, that was, distractibility ("During this activity, the children I am working with are restless, run about or jump up and down, do not keep still"), aggression ("During this activity, the children I am working with are kicking, biting and hitting each other") and fear ("During this activity, the children I am working with are miserable, unhappy, tearful, or distressed") ($\overline{\alpha} = 0.71$).

Episodic hindrance job demands. Social conflict was measured with three items from the social conflict questionnaire (Abbey *et al.*, 1985): "During this activity, my colleagues got on my nerves", "During this activity, my colleagues have done things that conflicted with my own sense of what should be done" and "During this activity my colleagues acted in an unpleasant or angry manner toward me." The overall average Cronbach's α for this scale is $\overline{\alpha} = 0.57$. Nunnally (1978) recommends a value of 0.70 as an acceptable Cronbach's α. However, because fewer items lower the Cronbach's α value, Briggs and Cheek (1986) recommend reporting the mean inter-item correlation. An optimal value for inter-item correlation among items is in the range of 0.20–0.40. For this scale, the mean inter-item correlation is 0.51.

Task attentional pull. Based on the EPM literature, we developed three items to measure attentional pull. These items were: "During this activity, my attention was pulled towards my work", "This activity continuously attracted my attention", and "This activity demanded all my attention." We pilot-tested the items in an independent study by asking 26 employees to fill out the brief scale. Cronbach's α was 0.79 for the pilot test. The average Cronbach's α in the present study was also 0.82.

Episodic cognitive interference. We measured cognitive interference with three items from the Cognitive Interference Questionnaire (Sarason *et al.*, 1986): "During this activity, I have been thinking about other activities", "During this activity, I have been thinking about something that happened earlier" and "During this activity, I have been thinking about personal worries." The average Cronbach's α for this scale is $\overline{\alpha} = 0.81$.

Episodic performance. We measured self-rated performance by combining three items from two different measures. One item was taken from Fisher and Noble's (2004) performance scale ("How would you rate your performance on the activity you were doing?"). The rating scale ranged from 1 to 5 and the anchors were bad, poor, average, good and excellent. In addition, two items were taken from Casimir *et al.* (2006) self-rated performance scale ("During this activity, I made good use of my working time" and "During this activity, I am working hard") ($\overline{\alpha} = 0.81$). The rating scale ranged from 1 (strongly disagree) to 5 (strongly agree).

Control variables. We controlled for time of the day because previous studies have shown that time of the day can influence affective experiences (e.g. Csikszentmihalyi and Hunter, 2003). In addition, and importantly, in order to control for any spillover effects, we corrected for the episodic work engagement and performance of the previous activity ($t-1$).

Strategy of analysis

The substantive focus of interest in our hypotheses is on the episodic level. To accurately address such episodic relations, we tested the hypothesized model at the episodic level (within-person). Accordingly, we used a multilevel path analysis with Mplus 7.4

(Muthén and Muthén, 2015) to distinguish between three levels of analysis: The between person level (level 3), the day level (level 2) and the episodic level (level 1). The reason for the three levels of analysis is that the ESM data are naturally hierarchically organized (see Ohly *et al.*, 2010 for an overview) where the activities are nested within days, and days are nested within persons. Next, we determined whether there was sufficient variance at the episodic level by assessing the intraclass correlations coefficient (ICC (1)) (Hox, 2010). We person-mean centered the episodic level variables and grand mean centered the enduring work engagement measure. We estimated path coefficients using the maximum likelihood method in Mplus.

Results

Descriptive statistics

Table I summarizes the descriptive statistics among the study variables. In our data the ICC (1) values were significant at the between person-level with a substantial episodic within-person portion of the total variance for each scale (40–84 percent; see Table I), supporting the use of a three-level multilevel modeling analyses.

Measurement model

We first conducted a multilevel confirmatory factor analysis (MCFA) to examine a series of measurement models to support the operationalization of our variables at the episodic level (level 1).

Specifically, the first measurement model consisted of four latent factors, indicated by three items each: cognitive interference, attentional pull, work engagement and job performance. This model showed satisfactory fit to the data at the within person-level, χ^2 (48) = 208.95, $p < 0.001$, CFI = 0.95, TLI = 0.93, RMSEA = 0.08, SRMR = 0.04 (episodic level). The findings clearly indicate that all the model variables could be empirically distinguished at the episodic level. The output of these MCFAs is available from the first author upon request. Next, we compared this measurement model to a three-factor model

Scale	1	2	3	4	5	6	7	8
1. Work engagement	(0.84)	0.33***	−0.22***	−0.12*	0.54***	−0.43***	0.41***	–
2. Episodic job resources	0.54***	(0.85)	−0.12	−0.13*	0.30***	−0.16*	0.05	–
3. Episodic challenge job demands	−0.13	−0.14	(0.71)	0.13*	−0.11	0.09	−0.18**	–
4. Episodic hindrance job demands	−0.12	−0.20	−0.00	(0.57)	−0.05	0.15*	−0.06	–
5. Attentional pull	0.70***	0.49***	0.04	−0.23	(0.82)	−0.37***	0.47***	–
6. Cognitive interference	−0.43***	−0.18	0.36*	0.20	−0.35*	(0.81)	−0.33***	–
7. Performance	0.52***	0.44**	−0.04	−0.19	0.58***	−0.33*	(0.81)	–
8. Trait work engagement	0.63***	0.40**	−0.07	−0.18	0.53***	−0.29*	0.27	(0.81)
Grand mean	5.29	5.93	1.64	1.19	5.22	2.42	4.31	4.21
Between-person SD	0.79	0.65	0.53	0.23	0.93	0.97	0.37	0.65
Within-person SD	1.07	0.79	0.90	0.51	1.03	1.08	0.52	–
Proportion within variance (%)	64	57	84	40	76	52	75	–

Table I.
Means, standard deviations and correlations among the study variables

Notes: $n = 266$ episodic surveys (average nine surveys per person) from 48 participants. Between person-level correlations for the observed variables are given below the diagonal; episodic level correlations for the observed variables are given above the diagonal. Scale reliabilities averaged across the five days are shown in parentheses on the diagonal. *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

in which the work engagement and attentional pull items were allowed to load on one factor (see Table II) and found that the proposed measurement model fit best to the data.

The third measurement model consisted of two latent factors (i.e. challenge and hindrance job demands) indicated by three items each, and one second-order factor for the episodic job resources indicated by two latent factors (colleague support and autonomy). Three items each indicated the colleague support and autonomy factors. The model showed an acceptable fit to the data χ^2 (49) = 122.83, $p < 0.001$, CFI = 0.97, TLI = 0.96, RMSEA = 0.05, SRMR = 0.05 (episodic level). Next, we compared these measurement models to a one-factor model (see Table II) and found that the proposed measurement models fit best to the data.

Testing the hypothesized model

Next, we tested our hypothesized model (see Figure 1) using multilevel path analysis. By using a multilevel analysis, we can allow our intercept to be random while the slope is fixed. That is, for every person, we permit the intercept to be different, but we assume that the slope of the line is the same for each relation we test in every person (Hox, 2010). In our research, we do not test a cross-level interaction where we would need a random slope to allow a regression coefficient to be different due to a higher-level variable, such as age or gender. *H1a* states that episodic job resources are positively related to episodic work engagement. Results showed that episodic job resources were positively related to episodic work engagement ($\gamma = 0.24$, SE = 0.07, $p < 0.01$). Thus, *H1a* is supported. In addition, *H1b* states that episodic challenge job demands boost the positive relation between episodic job resources and episodic work engagement. However, episodic challenge job demands do not boost the relation between episodic job resources and episodic work engagement ($\gamma = 0.06$, SE = 0.06, $p = 0.31$). Hence, *H1b* is not supported. Moreover, *H1c* states that episodic hindrance job demands weaken the positive relation between episodic job resources and episodic work engagement. Consistent with the latter hypothesis, we find that the relation between episodic job resources and episodic work engagement is weaker on episodes that employees face high (vs low) social conflict ($\gamma = -0.40$, SE = 0.12, $p < 0.01$, see Figure 2). The line representing low hindrance job demands had a significantly steeper slope ($\gamma = 0.40$, SE = 0.09, $z = 4.63$, $p < 0.001$) than the line representing high hindrance job demands ($\gamma = 0.04$, SE = 0.09, $z = 1.42$, $p = 0.637$) lending support to *H1c*.

H2a states that attentional pull relates positively to episodic work engagement. The results of the multilevel analysis indicate that this hypothesis is supported ($\gamma = 0.43$, SE = 0.06, $p < 0.001$). The teachers are more engaged during the episodes in which their attention is pulled toward the work activities even after controlling for the episodic work engagement of the previous activity. Additionally, *H2b* states that cognitive interference relates negatively to episodic work engagement. In support of *H2b*, cognitive interference is negatively related with episodic work engagement ($\gamma = -0.21$, SE = 0.05, $p < 0.001$).

Finally, according to *H3*, episodic work engagement relates positively to episodic performance and mediates the relation between episodic job demands, job resources,

Models	Fit indices CFI	RMSE	SRMR
1. Four-factor model	0.95	0.08	0.04
2. Three-factor model	0.84	0.14	0.07
3. Two-factor model	0.97	0.05	0.05
4. One-factor model	0.38	0.12	0.13

Table II. Fit of the measurement models

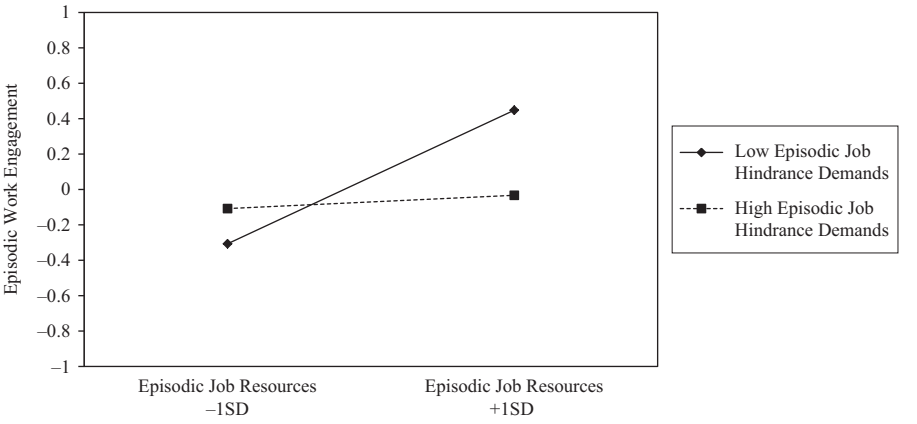

Figure 2.
Episodic job resources interaction with episodic hindrance job demands for work engagement

cognitive interference and attentional pull and episodic job performance. We tested this hypothesis using Selig and Preacher's (2008) online interactive tool. This tool uses the parametric bootstrapped method to create confidence intervals to examine the significance of the indirect effects. The results of the model showed that episodic work engagement is positively related to performance ($\gamma = 0.20$, SE = 0.03, $p < 0.001$). The mediation effects were significant for episodic job resources (0.05, $p < 0.01$, 95% CI [0.02, 0.08]), episodic challenge job demands (−0.03, $p < 0.05$, 95% CI [−0.05, −0.01]), attentional pull (0.09, $p < 0.001$, 95% CI [0.04, 0.11]) and cognitive interference (−0.04, $p < 0.01$, 95% CI [−0.06, −0.02]). However, the mediation effect was not significant for episodic hindrance demands. This means that *H3* is partially supported. However, it should be noted that the hypothesized model did not fit well to the data. χ^2 (11) = 42.57, $p < 0.001$, CFI = 0.86, TLI = 0.68, RMSEA = 0.10, SRMR = 0.03 (episodic level), SRMR = 0.01 (person-level). After examining our correlation table, we inferred that one possible reason for the poor model fit of our hypothesized model is that the independent variables, such as attentional pull and cognitive interference also have direct relationships with the dependent variable – episodic job performance. The correlation between attentional pull and cognitive interference to performance ranges between ($r = -0.33$) and ($r = 0.47$).

Additional analyses

To test an alternative model, we compared the fit of our hypothesized model (M1) to the fit of the partially mediated model (M2) including direct effects from episodic work engagement, cognitive interference and attentional pull to episodic performance. Results showed a significant decrease in χ^2 ($\Delta\chi^2 = 26.24$ (2), $p < 0.001$), indicating that the alternative model including the direct effects fits better to the data. Table III shows results of the two separate nested multilevel models predicting episodic work engagement and performance.

The final model (see Figure 3) fits well to the data χ^2 (9) = 16.33, $p = 0.06$, CFI = 0.97, TLI = 0.91, RMSEA = 0.05, SRMR = 0.02 (episodic level), SRMR = 0.00 (person-level). However, the indirect effects for job resources (0.02, $p = 0.07$), challenge demands (−0.01, $p = 0.10$), attentional pull (0.03, $p = 0.05$) and cognitive interference (−0.02, $p = 0.06$) were no longer significant after including the direct effects. In this model, episodic job resources, challenge (hindrance) job demands, attentional pull and cognitive interference explained 43 percent of the variance in episodic work engagement and 25 percent in episodic performance. Note that enduring work engagement was positively related to the aggregated measurements of episodic work engagement ($\gamma = 0.72$, SE = 0.16, $p < 0.001$).

Table III.
Results of moderated path analysis: interactions of resources and hindrance job demands on episodic engagement and performance

Predictor	Episodic work engagement UPC (SE)	Episodic work engagement SPC	Performance UPC (SE)	Performance SPC	Fit χ^2 (df)	Fit RMSEA	Fit CFI	Fit TLI	Fit SRMR
Model 1									
Episodic work engagement	–	–	0.20 (0.03)	0.40***	42.57*** (11)	0.10	0.86	0.68	0.03
Attentional pull	0.43 (0.06)	0.42***							
Cognitive interference	−0.21 (0.05)	−0.22***							
Job resources	0.24 (0.07)	0.18***							
CD	−0.17 (0.06)	−0.14**							
HD	−0.14 (0.11)	−0.07							
Job resources × CD	0.06 (0.06)	0.05							
Job resources × HD	−0.40 (0.12)	−0.18**							
R^2 (%)	44***		17**						
Model 2									
Episodic work engagement	–	–	0.08 (0.04)	0.16*	16.33 (9)	0.05	0.97	0.91	0.02
Attentional pull	0.43 (0.06)	0.41***	0.16 (0.04)	0.32***					
Cognitive interference	−0.21 (0.05)	−0.22***	−0.06 (0.03)	−0.11					
Job resources	0.25 (0.07)	0.18***	–	–					
CD	−0.17 (0.06)	−0.14**	–	–					
HD	−0.14 (0.11)	−0.06	–	–					
Job resources × CD	0.06 (0.06)	0.06	–	–					
Job resources × HD	−0.40 (0.12)	−0.18**	–	–					
R^2 (%)	43***		25***						
ΔR^2 (%)	0		8						
$\Delta\chi^2$	26.24***								

Notes: CD, challenge job demands; HD, hindrance job demands. *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

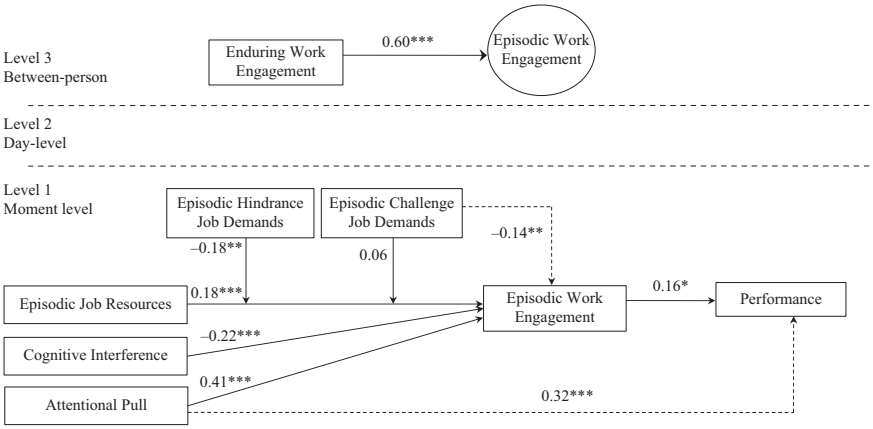

Figure 3.
Model of episodic work engagement showing standardized estimates

Notes: Episodic engagement at the person level is in an ellipse because it indicates that is a latent continuous variable that varies across individuals. Non-significant direct effects to performance are not shown for clarity purposes. *$p<0.05$; **$p<0.01$; ***$p<0.001$

Discussion

Integrating JD–R theory (Bakker and Demerouti, 2014) and the EPM (Weiss *et al.*, 2004), the present study aimed to test whether cognitive mechanisms, such as attentional pull and cognitive interference, are related to job performance through the experience of episodic work engagement. We examined these associations at the episodic level while accounting for the effects of job demands and job resources on performance through work engagement (Bakker *et al.*, 2007). The results suggest that episodic work engagement is positively related to episodic performance.

Employees perform better and make better use of their time when they feel more enthusiastic, vigorous and immersed in a work activity. Additionally, as employees experience support from a colleague or freedom in executing their work, and their attention is captured by the task, employees invest more energy and effort in a work activity. Conversely, employees are less likely to immerse and persist in a work activity, when they are having thoughts that are unrelated to the work activity itself or when they are facing DCB from children. Moreover, we found support for our prediction that when employees experience social conflict, they are unable to use their job resources of support and autonomy to foster their work engagement toward the primary work activity.

Theoretical implications

Our findings have several important theoretical implications. First, we are one of the first to provide empirical support for the EPM's (Beal *et al.*, 2005) basic propositions that attentional pull facilitates the dedication of all cognitive resources to the task, while cognitive interference prevents it. We relied on Beal *et al.*'s (2005) EPM to explore a cognitive mechanism (i.e. attentional pull and cognitive interference) that is related to episodic fluctuations in work engagement and performance in addition to the motivational process proposed by JD–R theory. For the cognitive mechanism of attentional pull, we found that the more a work activity captures an employee's attention, the more the person experiences enthusiasm and concentration in this activity. Additionally, performance is also rated better during that work activity. This finding is in line with Beal *et al.*'s (2005) proposition that attentional pull facilitates attending to a work activity. Moreover, this finding aligns with experimental lab research on attentional capture, which shows certain packaging features

capture the consumer's attention and facilitates conscious processing of the package nutrition labeling (Ares *et al.*, 2012; Wyble *et al.*, 2013). Furthermore, for the mechanism of cognitive interference, the results of our study indicate that when employees experience non-work-related interfering thoughts, they are less vigorous, enthusiastic and immersed during that work activity. This is in line with Oldham's *et al.* (1991) findings showing that concentration deteriorates when people face interruptions.

Second, our results extend existing work, by theoretically integrating JD–R theory with the EPM. Following the EPM proposition that performance is episodic due to the changes in work activities throughout the day, we show that resources and demands have an episodic nature (68–82 percent episodic variance). In line with the JD–R theory, we find that at the episodic level job resources can be initiators of a motivational process that is reflected in employees experiencing higher work engagement across different work activities during a day. Additionally, our findings indicate that hindrance job demands undermine this positive relation. Recent studies that integrate JD–R theory with the challenge and hindrance stressor framework (Bakker and Sanz-Vergel, 2013; Breevaart and Bakker, 2018; Tadić *et al.*, 2015) show that the joint effect of challenge job demands with job or personal resources leads to higher work engagement levels, while the combined effect of hindrance job demands with job or personal resources leads to lower work engagement levels. Our finding that hindrance job demands, in this case having a conflictive colleague, undermines the positive relation between job resources and work engagement extends previous research (e.g. Tadić *et al.*, 2015). It demonstrates that this relationship also holds at the episodic level.

However, we did not find that challenges boosted the relation between episodic job resources and work engagement. Instead, we found that the more DCB the teachers experienced, the less engaged they were in their work. The negative relation may be due to measuring misbehavior that is highly difficult (e.g. children biting each other) relative to more prevalent children's behavior such as irritability. Additionally, it is possible that the outcome could have affected the motivation of the teacher. If teachers could successfully deal with the misbehavior, then the DCB could be associated with experiencing higher motivation in the activity. We did not measure the outcome, so we cannot attest this possibility in our study.

Finally, this study focused on episodic work engagement to examine how episodic job resources, demands, attentional pull and cognitive interference relate to episodic job performance. Our results suggest that focusing all attentional resources in an activity is important for performance as it is highlighted in EPM. Therefore, it is important that activities attract the attention of employees because this relates to enhance concentration in the task, which is associated to better performance across work activities. However, the mediation of episodic work engagement in the relationship between episodic job resources, challenge demands, attentional pull and cognitive interference was only marginally significant. This was due to the addition of the direct paths between the independent variables and episodic performance. Future studies may examine the indirect relation between job demands, resources, attentional pull, cognitive interference and performance through work engagement using a larger sample size. Finding a marginally significant effect after controlling for direct effects is interesting as these results give a plausible indication that on the one hand cognitive interference and job demands can deter episodic work engagement. While on the other hand, job resources and attentional pull can stimulate episodic work engagement, which in turn leads to higher episodic performance.

Limitations and future research

The present study is not without limitations. First, the results are based on self-reports, which raises concerns about common method bias. However, our measurement model shows a good fit to the data and demonstrates that the constructs can be separated empirically.

Furthermore, methodological research suggests that individuals participating in ESM studies have lower recall biases compare to survey studies due to the immediacy of the questions to the event (Hektner *et al.*, 2007). This immediacy means that the individual has less time to adjust the answers so that they are socially desirable.

Second, we have repeated measures, but given the analyses, and the fact that we did not conduct an experiment, we do not have control over the causal ordering of the variables. Although we used JD–R theory and the EPM to have a firm basis for the direction of the effects, one may argue that highly engaged employees may also increase the levels of job resources in their day-care center (Schussler, 2009). Indeed, JD–R theory (Bakker and Demerouti, 2014) proposes that employees may use job crafting – i.e., proactive behavior – to optimize their work environment. Therefore, future studies should examine whether employees' high engagement levels could have catalyzed the autonomy and support they experience.

Third, in terms of generalizability, the sample is representative of female (92 percent) employees from the Netherlands and Iceland. However, the relationship between the study variables may differ for males and for employees from different cultural backgrounds, for example, because of higher levels of empathy that are typically found in females (Rueckert and Naybar, 2008). Future studies should try to replicate the current findings and test whether the results hold in other occupational groups and across genders and cultures.

Fourth, before the start of our research, we determined DCB to be a challenge demand. However, in our results we found DCB to be negatively related to episodic work engagement. In order to clarify whether a demand is a challenge or a hindrance, future research may ask participants to rate for each demand how challenging or hindering it is to them (cf. Bakker and Sanz-Vergel, 2013). Researchers may then add this subjective rating as a moderator to their analytical model. In this way, the research can more accurately test the challenge and hindrance stressor framework, which states that challenge job demands as opposed to hindrance job demands not only consume effort and energy, but can also be motivating. We could not disentangle this proposition completely in our study because we do not have enough empirical evidence to conclude that DCB was a challenge demand. Thus, it is conceivable that DCB was a hindrance job demand and that is why it was negatively related to episodic work engagement.

Practical implications

Our findings indicate that when employees have a helping hand and choice in how to execute a work activity, the employees' levels of engagement and performance are higher as well.

In terms of job design, it is beneficial for an individual's career development to understand how to stay engaged throughout different daily work activities as this is related to higher task performance. Our study informs employees that in order to stay engaged, it is imperative to have sufficient resources, such as freedom in the timing and methods used during work activities. Having sufficient resources helps to cope with hindrance job demands so that employees can stay engaged during a work activity. In addition, team-building activities may improve relations between colleagues and prevent social conflict during work activities, while fostering the exchange of social support.

Additionally, our research and findings may apply to other settings beyond the day-care setting. It is important to highlight that there are several similarities between a day-care setting and profit organizations. Indeed, in a day-care setting, there is a high amount of social interaction. Nowadays, social interaction is required in business-like environments. Between 1980 and 2012, there has been a 12 percent growth in jobs requiring social interaction (Deming, 2017). Sales departments, human resource management and project-based employees working in teams from different kind of industries (e.g. telecommunications, high-tech, energy, construction) require a high

amount of social interaction (Deming, 2017). In these kinds of environments, employees can experience autonomy, social support and social conflict due to the amount of social interaction that takes place between them, or between clients and customers (Bakker *et al.*, 2008). Additionally, employees may experience a different degree of autonomy when managing a project or different clients during a working day. In sum, the present research give us insight not only about how job resources and demands interact in a day-care setting, but also how these demands and resources relate to employee engagement in work settings that have a high degree of social interaction.

Furthermore, we demonstrated that when engagement in employees deteriorates, more cognitive interference is experienced. In terms of individual behavioral strategies, organizations may consider giving different kinds of training that can aid employees in dealing with these interfering thoughts. For example, a mindfulness training may help employees to self-regulate and experience less cognitive interference (Razza *et al.*, 2015). In addition, through job crafting employees can use their strengths, build job resources and reduce the impact of hindrance job demands, which facilitates work engagement (Tims *et al.*, 2013). For instance, employees can discuss with their supervisor how they can be better supported in a work activity that they feel insecure about.

Conclusion

We have shown that JD–R and the EPM theoretical frameworks can be integrated in order to have a more comprehensive understanding of the episodic fluctuations in work engagement and performance at work. This study has revealed that having interfering thoughts and facing DCB while undertaking a work activity, prevented employees from fully immersing in work activities. In addition, experiencing conflictive behavior from a colleague dampened the positive motivational process triggered by the episodic job resources on the employee's levels of enthusiasm and energy toward their various work tasks. Based on this knowledge, early childhood educators can optimize their internal and external work environment to be more engaged in their work activities and optimize their episodic performance.

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