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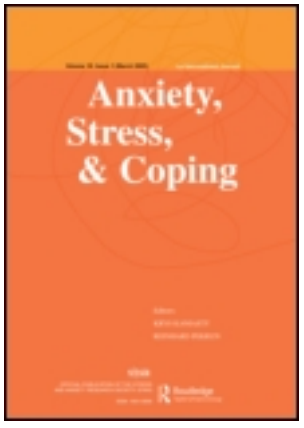

Anxiety, Stress & Coping: An International Journal
Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/gasc20

Watching the paint dry at work: psychometric examination of the Dutch Boredom Scale

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Accepted author version posted online: 10 Sep 2012.Published online: 21 Sep 2012.

To cite this article: Gaby Reijseger, Wilmar B. Schaufeli, Maria C.W. Peeters, Toon W. Taris, Ilona van Beek & Else Ouweneel (2013) Watching the paint dry at work: psychometric examination of the Dutch Boredom Scale, Anxiety, Stress & Coping: An International Journal, 26:5, 508-525, DOI: 10.1080/10615806.2012.720676

To link to this article: http://dx.doi.org/10.1080/10615806.2012.720676

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Anxiety, Stress, & Coping, 2013
Vol. 26, No. 5, 508–525, http://dx.doi.org/10.1080/10615806.2012.720676

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Watching the paint dry at work: psychometric examination of the Dutch Boredom Scale

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(*Received 30 November 2011; final version received 9 August 2012*)

Boredom at work is a state of employee unwell-being that is characterized by relatively low arousal and high dissatisfaction. At present little is known about boredom at work. In order to facilitate future research, the current study introduces a brief self-report questionnaire that assesses boredom at work, the Dutch Boredom Scale (DUBS). We argue that (1) boredom at work can be distinguished empirically from related concepts such as work engagement and job burnout; (2) boredom at work results from having an unchallenging, "passive" job; and (3) the subsequent lack of challenge in the form of boredom may result in dissatisfaction with the job and with the organization. Using data from 6315 employees, factor analysis supported the factorial and discriminant validity of the DUBS vis-à-vis engagement and burnout. As expected, structural equation modeling revealed that demands and resources were negatively associated with boredom. Moreover, boredom at work was negatively related with job satisfaction and organizational commitment, and positively with turnover intention. These findings support the validity of the DUBS. Future research may focus on underemployment as an antecedent of boredom at work, and on the effects of boredom on job performance.

Keywords: boredom at work; work engagement; burnout; job demands; job resources

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Although much psychological research has focused on the causes and consequences of overstimulation at work, the problem of *under*stimulation (or boredom) has largely been neglected (Fisher, 1993; Game, 2007). While the first attempts to assess boredom mostly relied on self-report, single-item measures (Vodanovich, 2003), other studies tapped boredom as a multi-dimensional concept (Farmer & Sundberg, 1986; Grubb, 1975; Lee, 1986; Zuckerman, Eysenck, & Eysenck, 1978). As these measures were based on different conceptualizations of boredom, as yet no coherent body of knowledge on its potential causes and consequences has emerged. This is unfortunate, as it has been argued that no $< 15\%$ of the workforce is actually bored when working (Rothlin & Werder, 2008). Therefore, the purposes of the present research are (1) to present a measure of boredom at work and (2) to enhance our understanding of its correlates.

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Measurement of boredom – state or trait?

Initially, boredom at work was associated with conducting monotonous and repetitive tasks (Lee, 1986; O'Hanlon, 1981). While Grubb (1975) and Lee (1986) measured boredom by referring to the repetitiveness of the job, others (Farmer & Sundberg, 1986; Zuckerman et al., 1978) considered boredom in terms of personal characteristics. For instance, Zuckerman et al. (1978) suggested that the experience of boredom results from a strong need for high stimulation. Although boredom is mostly considered an affective response, its occurrence is either attributed to the situation (i.e., a state, Mikulas & Vodanovich, 1993) or to a disposition (a trait, Vodanovich, 2003). The present research construes job boredom primarily as a response to a specific constellation of the characteristics of a particular environment (i.e., the job).

Drawing on the two dimensions proposed in *pleasure-arousal theory* (PAT; Russell, 1980), "feeling bored" has been classified as a displeasure-deactivation affect (Daniels, 2000). Following Mikulas and Vodanovich (1993), we consider boredom at work as a state of low arousal and dissatisfaction that results from an understimulating work environment. Considered to be more than affect alone, we assume that the experience of boredom at work manifests itself in affective, cognitive, and behavioral reactions (Russell, 2003). For example, in addition to its affective component, previous research found that low internal arousal manifests itself cognitively in inattention and daydreaming (Damrad-Frye & Laird, 1989), as well as in task-unrelated thoughts (Antrobus, Coleman, & Singer, 1967). Furthermore, work boredom manifests itself in a distorted perception of the passing of time, which seems to drag along and passes by slowly (Drory, 1982; Grubb, 1975). When having little to do at work, employees filled their idle time with other, unrelated tasks such as reading magazines, eating, or engaging in nonwork-related conversations (Baker, 1992). Further, work boredom has been found to relate to frustration and physical restlessness (Hill & Perkins, 1985). These findings underline our position that boredom at work is affective, cognitive, and behavioral in nature.

Earlier Job Boredom scales (Grubb, 1975; Lee, 1986) mainly focused on the causes of work boredom in terms of an understimulating work environment (e.g., repetitiveness or monotony) rather than on its affective, cognitive, and behavioral manifestations (Vodanovich, Wallace, & Kass, 2005). On the other hand, dispositional boredom scales (Farmer & Sundberg, 1986) take these different manifestations of boredom into account, but do not link these to the job. Therefore, the present study conceptualized a scale of work-related boredom in terms of employee's affective, cognitive, and behavioral responses to an understimulating work situation, thereby combining the strengths of previously developed boredom scales.

Boredom at work: another form of negative employee well-being

Conceptually, boredom at work is a response to a passive, unchallenging, and unpleasant job (Loukidou, Loan-Clarke, & Daniels, 2009). It is a negative, affective-motivational state of mind that results from a work environment that elicits little activity and provides little challenge and pleasure. However, little is known about the specific job characteristics – or lack thereof – that are associated with boredom among employees. The present study uses the Job Demands-Resources (JD-R)

Model (Schaufeli & Bakker, 2004) as a conceptual framework for understanding the relationship between certain job characteristics and employee well-being. The JD-R model distinguishes between two pathways that may affect employee well-being: an energetic and a motivational process. The former is sparked by high job demands (and poor resources), whereas the latter is initiated by job resources. So far, the JD-R model has mainly focused on burnout and work engagement as mediators in the energetic and motivational processes, respectively. Specifically, high demands and poor resources are, via burnout, associated with poor organizational commitment and high turnover intention (the energetic process); resources are, via engagement, related to organizational commitment and low turnover intention (the motivational process; Hakanen, Schaufeli, & Ahola, 2008; Schaufeli & Bakker 2004).

As yet, the JD-R model has not been applied to the combination of low energy (due to low demands) and low motivation (due to low resources). This particular combination of job characteristics produces an unchallenging work environment that demands little activity and gives little pleasure (Russell, 1980, 2003), which potentially results in boredom. On the basis of processes postulated by the JD-R model as well as on what people experience when feeling bored (Daniels, 2000), the current study proposes that work boredom is a kind of employee unwell-being that can theoretically and empirically be distinguished from burnout and engagement (Hypothesis 1).

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Nomological network of boredom at work

Although monotonous and repetitive jobs are associated with boredom (Hill & Perkins, 1985), not all workers in such jobs are equally susceptible to becoming bored, as the notion of dispositional boredom suggests (Farmer & Sundberg, 1986; Zuckerman et al., 1978). Therefore, in the current research boredom at work is not merely linked to the monotony or repetitiveness of the work tasks (Grubb, 1975; Lee, 1986). Rather, the JD-R model suggests that boredom at work can originate from tasks that are qualitatively and/or quantitatively undemanding (Parasuraman & Purohit, 2000).

Further, job resources have been construed as potential buffers of the adverse effects of dissatisfying tasks in inadequately stimulating situations on employees' well-being (Parker & Ohly, 2006). On the one hand, having abstract, unspecific work goals (Fisher, 1993), having few opportunities to make autonomous decisions, or having little variety presumably increases the occurrence of boredom (Hill & Perkins, 1985). On the other hand, social support from coworkers may reduce boredom at work (Parker & Ohly, 2006). These findings are consistent with our view that boredom is the result of having both low job demands and few resources. Therefore, on the basis of JD-R model (Schaufeli & Bakker, 2004) as well as on previous research on boredom, we assume that low levels of demands and resources are associated with low energy (arousal) and poor motivation in employees, that is, with work boredom (Hypothesis 2).

As for the consequences of boredom, boredom-prone employees tend to report low job involvement (Parasuraman & Purohit, 2000), and boredom at work is associated with job dissatisfaction, absenteeism, and low organizational commitment (Kass, Vodanovich, & Callender, 2001). Hence, we assume that work boredom relates

negatively to job satisfaction and organizational commitment, and positively to turnover intention (Hypothesis 3).

In order to achieve the two main purposes of the present research, two studies are presented. The first study developed and validated a state measure of boredom at work that includes its affective, cognitive, and behavioral manifestations (Farmer & Sundberg, 1986). The second study differentiated boredom from burnout and work engagement and studies its causes and consequences, using the JD-R model as a conceptual framework.

Study 1: development of the Dutch Boredom Scale (DUBS)

On the basis of our conceptualization of boredom at work as a negative affective-motivational state that originates from inadequate stimulation (Mikulas & Vodanovich, 1993), an eight-item instrument was designed. The items were adapted from previously developed general boredom scales (i.e., the Boredom Proneness Scale; Farmer & Sundberg, 1986, and the Job Boredom scales; Grubb, 1975, Lee, 1986) and referred to five common feelings, thoughts or (non)behaviors that occur when feeling bored at work: (1) *perception of time passage*, (2) *feeling bored,* (3) *feelings of restlessness and not knowing what to do* (i.e., Hill & Perkins, 1985), (4) *engaging in task-unrelated thoughts* (Damrad-Frye & Laird, 1989), and (5) *tendencies to do task-unrelated things* (Baker, 1992). Rather than assessing antecedent characteristics of the job, the items of the DUBS aimed to express the experience and manifestation of work boredom itself (i.e., Antrobus et al., 1967; Baker, 1992; Damrad-Frye & Laird, 1989; Hill & Perkins, 1985). Descriptions of job characteristics (e.g., monotony of the job) or feelings that could also signify other forms of unwell-being (e.g., feeling tired) were therefore excluded.

Method

Participants and procedure

To evaluate the validity and reliability of the DUBS, a survey was conducted across three samples. Sample 1 consisted of respondents from various organizational sectors who had participated in a psychosocial risk assessment. They were asked to fill out the DUBS as part of an occupational health audit. The link to the web-based questionnaire was distributed by the human resources departments of the participating organizations. Samples 2 and 3 were convenience samples and included respondents from various organizational sectors who completed online surveys. As the Internet has been proven to be an efficient and useful tool for data collection (Cook, Heath, & Thompson, 2000), data were collected through an open survey on the websites of two large Dutch companies in the fields of occupational health, coaching, and training. All participants were briefly introduced to the study, and anonymity and confidentiality of the data were emphasized. Participants answered questions on work characteristics and their well-being at work. Participants in the first and third sample also answered questions about organizational outcomes (i.e., job satisfaction and commitment).

Most participants in *Sample 1* ($N = 2342$) were employed in health care (56%), public administration (22%), and commercial services (16%). Of the total sample

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54.8% was male, M_{age} was 33 (SD = 8.85), and the majority held a university (48%) or a college degree (30%). *Sample 2* ($N = 1642$) consisted of employees of various organizational sectors. Most participants worked in commercial services (19%), health care (18%), and industry (10%), respectively. The sample included 576 males (35.1%). The mean age was 43 years (SD = 9.76). The majority of this sample had attended higher vocational training (51%) or held a university degree (28%). Finally, *Sample 3* ($N = 2331$) also included employees working in various organizational sectors. The majority of the participants worked in information and communications technology (19%), education (16%), and public administration (15%). The sample included 1153 males (49.5%). Their mean age was 43 years (SD = 10.99). The majority of this sample held a university degree (40%) or a higher vocational degree (39%).

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Measures: the DUBS

The items of the DUBS are presented in Table 1. In *Sample 1* ($M = .84$, SD = .63) we used a seven-point frequency rating scale ranging from 0 ("never") to 6 ("always"). In *Samples 2* ($M = 1.68$, SD = .73) and *3* ($M = 1.87$, SD = .78) all items were scored on a five-point frequency rating scale ranging from 1 ("never") to 5 ("always"). Thus, due to the different answering format the mean scores of the participants could vary across samples. As these scores may affect the results of further analyses, all items were standardized to *z*-scores within samples (Taris, Bok, & Meijer, 1998).

Statistical analysis

As all item scores correlated significantly with one another and only a one-dimensional construct was assumed, a principal component analysis (PCA) was

Table 1. Exploratory factor analysis results of the Dutch Boredom Scale (DUBS) in Sample 1 ($N = 2342$).

	Factor loadings	
Items	Factor 1	Factor 2
At work, time goes by very slowly	.52	−.36
I feel bored at my job	.78	−.31
At work, I spend my time aimlessly	.41	.65
At my job, I feel restless	.50	.55
During work time I daydream	.68	.17
It seems as if my working day never ends	.75	−.09
I tend to do other things during my work	.73	.12
At my work, there is not so much to do	.70	−.35
Eigenvalue	3.35	1.13
% of variance	41.85	14.06
α	.80	.46

Note: All items were self-constructed but based on Vodanovich (2003) classification of boredom's cognitive, affective, motivational, and behavioral components and drawn from previously designed scales such as the Boredom Proneness Scale (Farmer & Sundberg, 1986), and the two Job Boredom Scales (Grubb, 1975; Lee, 1986). All items load on both factors of which the highest loading is underlined. These underlined loadings are of significant importance based on Steven's (2002) recommendations.

conducted on the eight items with oblimin rotation across *Sample 1* in order to check whether the DUBS indeed consisted of one component. As the robustness of factor analysis also depends on sample size, the Kaiser–Meyer–Olkin (KMO) measure was used to assess the adequacy of the sample size for the analysis. For the overall scale KMO was .84; moreover, the KMO for all individual items was .80 or higher, thus satisfying the requirement that all KMO values should exceed .5 (Field, 2009).

To cross-validate the findings obtained for Sample 1, multiple-group confirmatory factor analysis (CFA) was used to establish the factorial invariance of the model obtained for Sample 1 across *Samples 2* and *3*. The fit of the model to the data was examined with the χ^2 goodness-of-fit statistic, the root mean square error of approximation (RMSEA), the Tucker–Lewis index (TLI), and the comparative fit index (CFI). Generally, models with TLI and CFI $>.90$, and RMSEA $<.08$ represent close fit between the hypothesized model and the data (Hoyle, 1995).

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Results

Sample 1: principal component analysis

The PCA extracted two factors for the eight items with eigenvalues exceeding 1.0. The first factor explained 41.9% of the variance, whereas the second factor accounted for an additional 14.1%. While all items loaded highly on the first factor (factor loadings varied from .41 to .78), the two items that also loaded highly on the second factor specifically tapped behavioral manifestations of boredom at work. The item "At my work, I spend my time aimlessly" loaded .41 on the first factor and .65 on the second factor. For the item "At my job, I feel restless," factor loadings of .50 on the first and .55 on the second factor were found (Table 1). These findings suggest that these two items tap behaviors that may not be unique to boredom at work. Furthermore, the correlations between these two items and the remaining six items were usually less (most $rs <.3$) than the correlations among these other six items. On the basis of these results, these two items were omitted from the DUBS. A PCA of the remaining six items yielded a one-factor solution that accounted for 51.0% of the variance. Cronbach's α showed high internal consistency (.80), and a mean item-total correlation of .55 was observed. These findings suggest that – after removing two items – the DUBS is a reliable, one-dimensional measure of boredom at work.

Samples 2 and 3: confirmatory factor analyses

Cross-validation of the one-factor model showed a good fit for most fit indices (χ^2 ($N = 1642$, df $= 9$) $= 357.5$; $p <.001$, TLI $= .90$, CFI $= .94$ in *Sample 2*; χ^2 ($N = 2331$, df $= 9$) $= 396.9$; $p <.001$, TLI $= .92$, CFI $= .95$ in *Sample 3*). However, for both samples the RMSEA values were slightly off with values of .15 in *Sample 2* and .14 in *Sample 3*. Although these values indicate relatively poor fit, RMSEA is highly sensitive to model complexity, with complex models yielding lower RMSEAs (Kenny & McCoach, 2003; Kline, 2005). To decide whether the model needed re-specification, we inspected the modification indices. These indicated that model fit could be increased by allowing the error terms for the items (1) "At work, time goes by very slowly" and "It seems as if my working day never ends," and (2) "During

work time I daydream'' and ''I tend to do other things during my work'' to correlate. This model fitted the data significantly better (*Sample 2*: $\Delta\chi^2$ (df = 2) = 314.6, $p < .001$; *Sample 3*: $\Delta\chi^2$ (df = 2) = 284.1, $p = < .001$) with TLI = .99, CFI = .99, and RMSEA = .06 for *Sample 2* and TLI = .97, CFI = .99, and RMSEA = .08 for *Sample 3*, respectively. Thus, the one-factor model was accepted as a reasonable model for the data.

Multiple group confirmatory factor analyses

A multi-group CFA found no significant differences between the model in which the factor loadings varied across *Samples 2* and *3* and the model in which these loadings were constrained to be equal, $\Delta\chi^2$ (df = 5) = 3.32, $p = .65$, indicating that these loadings were basically invariant across samples.

Discussion

Study 1 presented a measure of boredom at work that conceives boredom as a negative psychological state of employee well-being (Mikulas & Vodanovich, 1993). Drawing on data from three large samples, PCA and CFA provided evidence for a theoretically interpretable one-factor, six-item scale. The two items that were deleted from the scale focused on behavioral aspects of boredom at work (i.e., Hill & Perkins, 1985). The results obtained for these two items were inconclusive and ambiguous, as compared to the other six items. Restlessness and aimlessness have previously also been found to relate positively rather than negatively to anxiety (i.e., Denollet, Strik, & Lousberg, 2006; Diefenbach et al., 2001). Therefore, our referring to ''spending time aimlessly'' and ''feeling restless'' in these items may have been ambivalent for the participants, as these behaviors may stem from stress or depression rather than boredom. Thus, these items were deleted. Overall, our analyses suggest that the six-item DUBS is a factorially valid and internally consistent measure of boredom at work.

Study 2: boredom, employee well-being, job characteristics and organizational outcomes

The present study construes boredom at work as a distinct form of employee well-being that can be discriminated from burnout and engagement. Due to an understimulating work situation (Mikulas & Vodanovich, 1993), boredom would be characterized by a different balance of arousal and pleasure, compared with burnout and engagement (Hakanen et al., 2008). Drawing on the two processes postulated in the JD-R model (Schaufeli & Bakker, 2004) as well as on emotion-focused models of well-being such as Russell's (1980) PAT (Daniels, 2000), we assume that boredom at work stems from having an *under*stimulating and unpleasant job. In contrast, burnout is the result of *over*stimulation at work, and engagement results from an optimal and therefore *pleasurable* work stimulation (Bakker & Demerouti, 2007). Although having different causes, boredom and burnout manifest themselves in similar ways among employees – that is, deactivation and unpleasantness (cf. Russell, 1980). However, whereas boredom at work relates strongly to the activation–deactivation axis, burnout also relates strongly to the pleasure–displeasure

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axis (Daniels, 2000). Thus, we assumed that boredom can be distinguished from burnout and engagement (Hypothesis 1).

In an attempt to reveal its nomological network, work boredom was studied using the JD-R Model (Bakker & Demerouti, 2007). We assumed that bored employees would experience low levels of job demands and job resources (Hypothesis 2). Finally, boredom at work should be negatively related to positive organizational outcomes and positively to negative outcomes (Hypothesis 3).

Method

Participants and procedure

To assess whether boredom at work can be distinguished from burnout and engagement (Hypothesis 1), a series of CFA were conducted using the three samples described in Study 1. Hypotheses 2 and 3 were tested using Samples 1 and 3 only, as these two samples included both work characteristics and organizational outcomes.

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Measures

Three different *job demands* were assessed using scales developed by Van Veldhoven and Meijman (1994). All items used a five-point frequency scale ranging from 1 (“never”) to 5 (“always”). *Workload* included five items that refer to quantitative, demanding aspects of the job such as time pressure and working hard. An example item is: “Do you have too much work to do?” *Mental demands* were assessed by five items, such as “Does your work require a great deal of diligence?” *Emotional demands* were measured with three items, including “Does your work put you in emotionally charged situations?”. All items were coded in such a way that higher scores referred to high demands. The internal consistency (Cronbach’s α) of the job demands scales ranged from .82 to .86.

Further, three *Job resources* were included in this study. *Autonomy* was assessed with three items, such as “I can decide myself how I execute my work.” *Social support from colleagues* was measured with three items, including “Can you ask your colleagues for help if necessary?” Finally, *Social support from supervisor* was assessed with two items, including “Can you ask your supervisor for help if necessary?” Higher scores refer to high resources. The reliabilities of the job resources scales ranged from .84 to .90.

Employee well-being

The measure for *boredom at work* was the six-item scale described in Study 1. The full DUBS is shown in Table 1 (i.e., the items loading on factor 1). The internal consistency (Cronbach’s α) of the DUBS was .87.

The two core dimensions of *burnout* (i.e., exhaustion and cynicism; Schaufeli & Taris, 2005) were assessed with the Dutch version (Schaufeli & Van Dierendonck, 2000) of the Maslach Burnout Inventory-General Survey (MBI-GS; Schaufeli, Leiter, Maslach, & Jackson, 1996). The subscale *Exhaustion* (EX) consisted of five items; for example, “I feel used up at the end of a work day.” *Cynicism* (CY)

consisted of four items; for example, "I doubt the significance of my work." All items were scored on a scale ranging from 0 ("never") to 6 ("always").

The shortened version of the Utrecht Work Engagement Scale (UWES; Schaufeli, Bakker & Salanova, 2006) assessed *work engagement*, reflecting its three dimensions vigor, dedication, and absorption. All subscales consisted of three items; *Vigor* (VI); for example, "When I get up in the morning, I feel like going to work," *Dedication* (DE); for example, "I am enthusiastic about my job," and *Absorption* (AB); for example, "I feel happy when I am working intensely" (0 = "never," 6 = "always").

Organizational outcomes

Job satisfaction was measured with three items adapted from Price (1997), such as "I feel happy with my job" (1 = "strongly disagree," 5 = "totally agree"). *Organizational commitment* was based on Allen and Meyer's (1990) affective commitment scale and included five items, for example, "This organization has a great deal of personal meaning for me" (1 = "strongly disagree," 5 = "strongly agree"). *Turnover intention* was measured using three items (Van Veldhoven & Meijman, 1994), such as "I intend to change jobs during the next year" (1 = "strongly disagree," 5 = "totally agree").

Statistical analyses

Structural equation modeling using maximum likelihood estimation (Arbuckle, 1997) was used to test the hypotheses. To reduce bias in structural parameters when examining whether the unidimensional construct of work boredom could be distinguished from the multi-dimensional constructs engagement and burnout (*Hypothesis 1*) (i.e., Marsh, Byrne, & Seeshing Yeung, 1999), the six boredom items were randomly assigned to three parcels of two items each (Bandalos, 2002). Similarly, the items of organizational commitment were randomly assigned to three parcels in order to test Hypothesis 3. Hypotheses 2 and 3 were tested simultaneously by placing work boredom as mediator in between the job characteristics and organizational outcomes. Bootstrapping methods in AMOS examined the model fit using the same fit indices used in Study 1.

Results

Descriptive statistics

Table 2 presents the means, standard deviations, internal consistencies (Cronbach's α), and intercorrelations for all study variables. As all αs exceeded .80, all variables met Nunnally and Bernstein's (1994) criterion for acceptable reliability.

Boredom at work vis-à-vis engagement and burnout

To examine whether work boredom could be distinguished from engagement and burnout, we compared the fit of three competing models. First, a one-factor model was tested in all three samples simultaneously ($N = 6315$). This model (M_1) assumed one underlying general well-being factor that included all burnout and engagement

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Table 2. Means (*M*), standard deviations (SD), internal consistencies (standardized Cronbach's α – on the diagonal) between the variables ($N = 6315$).

			r															
	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Workload	2.95	0.89	(0.89)															
2. Emotional demands	2.02	0.79	0.23	(0.82)														
3. Mental demands	3.58	0.82	0.53	0.21	(0.86)													
4. Autonomy	3.62	0.86	0.08	−0.06	0.13	(0.84)												
5. Support colleagues	3.55	0.95	0.02	−.16	0.14	0.28	(0.87)											
6. Support supervisor	3.34	1.14	−0.01	−0.23	0.12	0.33	0.52	(0.90)										
7. Exhaustion	1.82	1.23	0.20	0.38	0.09	−0.28	−0.33	−0.33	(0.92)									
8. Cynicism	1.81	1.37	−0.01	0.24	−0.14	−0.34	−0.37	−0.42	0.68	(0.89)								
9. Vigor	3.27	1.24	0.12	−0.10	0.21	0.41	0.40	0.38	−0.58	−0.64	(0.90)							
10. Dedication	3.56	1.39	0.17	−0.03	0.31	0.46	0.39	0.40	−0.46	−0.69	0.80	(0.93)						
11. Absorption	3.19	1.22	0.18	0.01	0.30	0.37	0.30	0.30	−0.35	−0.52	0.72	0.79	(0.80)					
12. Boredom at work	0.00[a]	1.00[a]	−0.28	−0.04	−0.22	−0.27	−0.15	−0.15	0.32	0.47	−0.43	−0.46	−0.36	(0.87)				
13. Engagement	3.34	1.18	0.17	−0.05	0.30	0.45	0.40	0.39	−0.51	−0.67	0.91	0.94	0.91	−0.46	(0.94)			
14. Burnout	1.82	1.19	0.10	0.33	−0.03	−0.34	−0.38	−0.41	0.91	0.93	−0.67	−0.64	−0.48	0.44	−0.65	(0.93)		
15. Job satisfaction	3.57	0.95	0.10	−0.11	0.22	0.42	0.39	0.44	−0.56	−0.75	0.70	0.79	0.61	−0.43	0.77	−0.71	(0.93)	
16. Organizational commitment	3.10	0.78	0.15	0.01	0.19	0.33	0.23	0.30	−0.24	−0.41	0.42	0.50	0.46	−0.28	0.51	−0.36	0.49	(0.85)
17. Turnover intention	3.07	1.12	0.01	0.13	−0.12	−0.24	−0.26	−0.34	0.39	0.57	−0.44	−0.53	−0.40	0.29	−0.50	0.53	−0.62	−0.37	(0.89)

Notes: Correlations of 15–17 are based on Samples 2 and 3 combined ($N = 4673$). $.03 < r < .04$ are significant at $p < .05$, $r \geq .04$ are significant at $p < .001$.
[a]Mean and SD are based on standardized scores due to differences in rating scales over the different samples.

Table 3. Fit of models that specify the relationship between boredom at work, work engagement, and burnout.

Model step	χ^2	df	p	CFI	RMSEA	TLI
Confirmatory factor analyses ($N = 6315$)						
1. One-factor model M1	9729.13	20	.000	0.71	0.28	0.59
2. Two-factor model M2	6519.25	19	.000	0.80	0.23	0.71
3. Three-factor model M3	1460.01	17	.000	0.96	0.12	0.93
4. Three-factor model adjusted M4	629.85	16	.000	0.98	0.08	0.97
Multi-group confirmatory factor analysis (M4) (sample 1: $N = 2342$; sample 2: $N = 1642$; sample 3: $N = 2331$)						
Unconstrained model	792.03	49	.000	0.98	0.05	0.96
Constrained model (factor loadings)	983.96	58	.000	0.97	0.05	0.96
	$\Delta\chi^2$	Δdf	p	ΔCFI	ΔRMSEA	ΔTLI
Measurement weights	104.06	16	$<.001$	.01	.00	.00

Note: $\Delta\chi^2$, chi-square difference; CFI, comparative fit index; RMSEA, root mean square error of approximation; TLI, Tucker–Lewis index; M4, three-factor model with error correlation of vigor and exhaustion.

dimensions and the randomly parceled, one-dimensional boredom construct. M_1 fitted poorly to the data, with none of the fit indices meeting its criterion for acceptable fit (Table 3). Although the two-factor model M_2, with the burnout dimensions (EX, CY) and the boredom parcels loading on one-factor and the engagement dimensions on the other, fitted the data significantly better than M_1, $\Delta\chi^2$ ($N = 6315$, df = 1) = 3209.9; $p < .001$, it still showed a poor fit (Table 3).

The third model (M_3) assumed that the dimensions of burnout, work engagement, and boredom would load on three distinct but correlated factors – "burnout,"

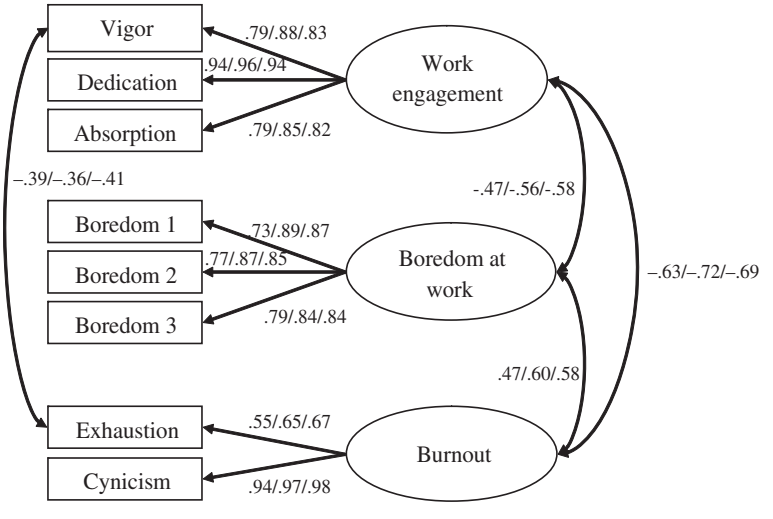

Figure 1. Final three-factor model (M_4) in confirmatory factor analyses in Sample 1/Sample 2/Sample 3.

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"engagement," and "boredom," respectively (Figure 1). This model fitted the data significantly better than M_2, $\Delta\chi^2$ ($N = 6315$, df = 2) = 5059.2, $p < .001$. In addition, all fit indices, with the exception of RMSEA, showed an acceptable fit to the data. Inspection of the modification indices revealed that (similar to previous studies, e.g., Schaufeli, Taris, & Van Rhenen, 2003) model fit could be improved by allowing the errors terms of exhaustion and vigor to correlate. This model (M_4) fitted the data acceptably well, $\Delta\chi^2$ ($N = 6315$, df = 1) = 830.16, $p < .001$. Hence, in line with Hypothesis 1, work boredom can be distinguished from burnout and engagement.

In an additional series of multi-group CFA, we tested whether the parameters of the best-fitting model (M_4) were invariant across all three samples. First, all the corresponding factor loadings were constrained to be equal across samples. Although this revealed a statistically significant increase of the chi-square value, the fit of the unconstrained and constrained models hardly varied in terms of the other fit indices (Table 3). Thus, although the item loadings on the three dimensions were not identical across samples (loadings were relatively low in Sample 1, with a mean difference of .065), from a practical point of view these differences can largely be neglected (Taris et al., 1998).

Antecedents and consequences of boredom at work

To examine whether both job demands and resources are related negatively to work boredom (Hypothesis 2), a model was tested in which the latent variables "job demands" and "job resources" each had three indicators (Figure 2). Finally, to test Hypothesis 3, latent variables were created for organizational commitment, job satisfaction, and turnover intention, respectively.

The full mediation model (M_{ind}) fitted the data reasonably well, with χ^2 ($N = 4673$, df = 126) = 3857.9, $p < .001$, CFI = .92, TLI = .91, and RMSEA = .08. Compared with models M_{dir} (with only direct relations between work characteristics

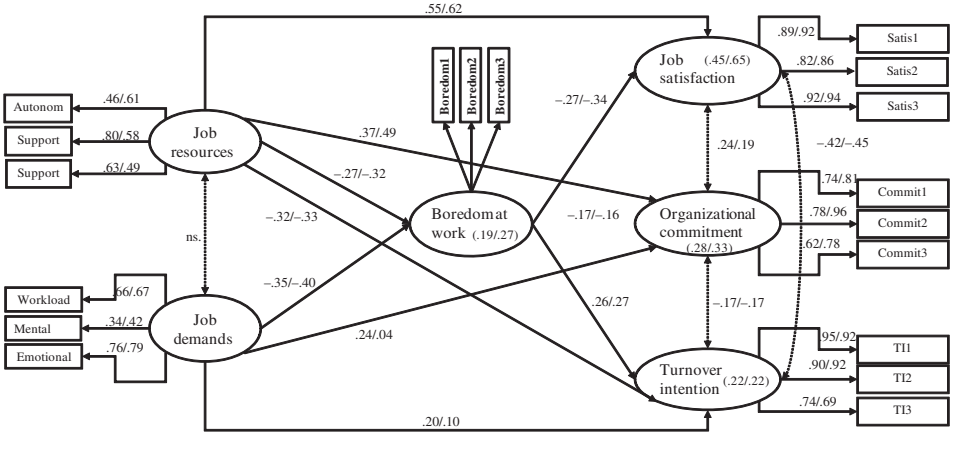

Figure 2. Best fitting research model (factor loadings and standardized path coefficients for Sample 1/Sample 3).
Note: The parceled indicators of boredom at work had significant factor loadings ranging from .74 to .80 in Sample 1 and from .84 to .87 in Sample 3.

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and organizational outcomes) and M_{bo} (the partial mediation model in which both direct and indirect relations were tested), the full mediation model (M_{ind}) fitted the data significantly worse, $\Delta\chi^2$ M_{ind} – M_{dir} ($N = 4673$, df = 3) = 962.7, $p < .001$, and $\Delta\chi^2$ M_{dir} – M_{bo} ($N = 4673$, df = 2) = 587.2, $p < .001$. Thus, the partial mediation model was the best-fitting model, with χ^2 ($N = 4673$, df = 121) = 2308.1, $p < .001$, CFI = .95, TLI = .94, and RMSEA = .06. In this model, all indicators loaded significantly on their intended latent factors and all effects were in the expected direction, except for the nonsignificant direct relation between job demands and job satisfaction (Figure 2). Therefore, this relation was omitted from the final model (M_{bo}). The partial mediation model revealed that both demands and resources were related negatively to boredom, confirming Hypothesis 2. In line with Hypothesis 3, work boredom was related negatively to organizational commitment and job satisfaction and positively to turnover intention. Table 4 displays the 95% confidence intervals for the partial mediation model (number of iterations = 1000).

Discussion

On the basis of data of three samples (total $N = 6315$), Study 2 examined the discriminant and concurrent validity of the DBS. Although boredom, burnout, and engagement were moderately correlated, boredom could be discriminated from burnout and engagement as a three-factor model fitted the data better than other, alternative models. Further, Study 2 tested a nomological network of boredom at work that was based on the JD-R model (Schaufeli & Bakker, 2004). Drawing on cross-sectional data from two samples (total $N = 4673$), work boredom partially mediated the relation between job characteristics and organizational outcomes.

Table 4. Bias-corrected confidence intervals of the best fitting, partial mediation model.

		Job demands 95% CI		Job resources 95% CI		Boreout 95% CI	
Effects	R^2	LL	UL	LL	UL	LL	UL
Total effects							
Boredom at work	.20	−.39	−.32	−.28	−.21	–	–
Job satisfaction	.57	.09	.12	.66	.72	−.33	−.27
Organizational commitment	.30	.14	.20	.46	.53	−.20	−.13
Turnover intention	.24	.002	.06	−.48	−.42	.19	.25
Indirect effects via boredom							
	Indirect (direct)						
Job satisfaction	.24 (.54)	.09	.12	.06	.08	–	–
Organizational commitment	.12 (.27)	.05	.07	.03	.05	–	–
Turnover intention	.09 (.22)	−.09	−.07	−.06	−.05	–	–

Note: CIs are based on the standardized effects; CIs were calculated using bootstrapping techniques in structural equation modeling, number of iterations = 1000. CI, confidence interval; LL, lower limit; UL, upper limit.

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As expected, both demands and resources were negatively related to boredom at work. Furthermore, the findings indicated that employees experienced more commitment and satisfaction when experiencing little boredom. The more boredom they experienced, the more employees intended to quit their jobs. Work boredom did not fully account for the relation between job characteristics and organizational outcomes. Job demands showed a direct positive relation to both organizational commitment and turnover intention. However, job demands were *not* directly related to job satisfaction, which may be due to the ambivalent and moderate relations between job satisfaction and the three job demands (cf. Table 2). Finally, job resources were positively associated with both job satisfaction and organizational commitment, but negatively with turnover intention. Taken together, our results confirm the conceptual validity of work boredom, in that this concept relates to possible antecedents and consequences in ways predicted by the JD-R model.

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General discussion

The present research examined a relatively neglected dimension of employee well-being; the experience of low arousal, unchallenging and dissatisfying work – or *boredom at work*. Specifically, we aimed: (1) to conceive a measure of work boredom that is based on the common denominator of previous general boredom measures; (2) to test a theory-based nomological network of boredom to establish the construct validity of boredom and enhance our understanding of its correlates. Our findings show that the newly developed DUBS is one-dimensional and internally consistent, and that it can be distinguished from scales that assess burnout and engagement. Next, the relations of work boredom with potential antecedents and consequences were studied, using the JD-R model as a conceptual framework. In line with our expectations, boredom was negatively related to both job demands *and* job resources. This underlines our assumption that work boredom results from a different constellation of job characteristics as compared to burnout and engagement. The former is likely to result from high demands and poor resources, whereas the latter is due to the availability of abundant resources (Bakker & Demerouti, 2007). Moreover, the more bored employees felt, the less satisfied with their job and the less committed to the organization they were.

These findings are in line with the assumption that especially workers with so-called "passive jobs" (Karasek, 1979) are at risk for experiencing boredom. Moreover, they support previous research that showed that employees felt less bored and more enthusiastic when they experienced more autonomy, a higher workload, more role clarity, and more support (Daniels, 2000). Also, the present study supported the idea that a lack of qualitative (i.e., mental demands) and quantitative demands (i.e., work overload) is associated with work boredom; such jobs can be characterized as unchallenging. Finally, consistent with findings that having unfriendly and uncommunicative coworkers can cause feelings of boredom (Fisher, 1993), the current research indicated that having unsupportive coworkers is indeed positively related to work boredom. Clearly, the social context of work is a risk factor for boredom. Finally, the present research suggests that boredom may have negative outcomes for the organization as well. Similar to previous research, boredom at work was associated with low job satisfaction (Lee, 1986), poor organizational commitment, and high turnover intentions (Kass et al., 2001).

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Study limitations

The four most important limitations of this research are the following. First, due to the cross-sectional design no causal relations could be established. Thus, the findings regarding the nomological network in which work boredom was placed are preliminary and should be interpreted with caution; longitudinal studies are necessary to further validate the findings (Taris & Kompier, 2006).

Second, the present research employed self-report questionnaires. Thus, common method bias may have biased the associations among the study variables (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). However, similar to burnout and engagement, experiencing boredom is in the eye of the beholder, and self-report measures are a natural way to tap into these concepts. It is therefore not easy to think of better (e.g., objective) ways to measure these concepts. Further note that factor analyses that included the scales tapping these three concepts clearly indicated that the fit of the model that assumed three different kinds of employee well-being was superior to a one-factor model. Apparently, common method bias is not likely to have inflated the associations among these concepts to such a degree that they could not be distinguished empirically (cf. Harman, 1976).

Third, two of the three samples used were convenience samples for which the representativeness for any target population is unknown (Cook et al., 2000), and differences between organizational sectors are unclear. However, the correspondence of the results in these samples suggests that the findings are robust and generalize across a range of different populations.

Finally, the average level of work boredom at work in our samples was very low, which may have led to restriction of range for this key concept. This implies that the associations between boredom on the one hand and the other concepts in our research may have been estimated conservatively. In this sense it is noteworthy that, despite low levels of boredom in all three samples, evident support was found for the proposed relations with job characteristics, and organizational outcomes.

Implications for research and practice

Despite these limitations, the current findings have implications for both research and practice. In addition to established concepts such as engagement and burnout, our results suggest that work boredom should be taken into account as an additional, distinct type of work-related well-being. Although early research investigated the relation between boredom and job performance, those studies mostly focused on monotonous and repetitive tasks (O'Hanlon, 1981). Our research shows that boredom at work may also result from a lack of both demands and resources, and may in turn influence organizational outcomes. Thus, our research shows that the range of possible risk factors for work boredom should be broadened beyond monotony.

Still, questions arise on the types of behavior that boredom at work may instill. For instance, does boredom provoke more counterproductive work behaviors (Bennett & Robinson, 2000), or do bored employees show more organizational citizenship behavior (Smith, Organ, & Near, 1983)? Both could result from the same desire of bored employees to seek alternative stimulation to compensate for their

understimulating, unchallenging job. Moreover, it is conceivable that bored employees who are qualitatively understimulated may perform their job with superior routine so that they outperform their nonbored colleagues. Quantitative understimulation, however, cannot lead to higher production as there is only so much work to do. But quantitative understimulation may be associated with high qualitative performance (e.g., customer satisfaction) as one can focus all attention to that one specific task.

Boredom at work is a psychological state that is most likely to exist when both demands and resources are low. In order to prevent boredom, jobs may be redesigned to increase the arousal experienced by employees. If it is impossible to provide a highly stimulating situation (Kerce, 1985), new personnel might be screened on their boredom propensity for these jobs.

Finally, although work-related boredom is more closely related to the arousal axis of the PAT (Russell, 1980) than to its pleasure axis (Daniels, 2000), it is not unlikely that boredom leads to depression (cf. Caplan, Cobb, French, Van Harrison, & Pinneau, 1975) or burnout (Melamed, Ben-Avi, Luz & Green, 1995). Moreover, work boredom has been theorized to lead to a decrease of knowledge, skills, and ability over time (Karasek & Theorell, 1990). To obtain more insight in the causal relations among these concepts and boredom at work, future research should study these relations using a longitudinal design. All in all, the current study presents an initial look into a relatively neglected state of employee unwell-being; boredom at work. The development and validation of the DUBS is a first step toward the systematic inclusion of boredom in research in occupational health psychology. In addition to addressing overstimulation of employees (e.g., by reducing job demands), the present study shows that sometimes attention should also be paid to *under*stimulation to increase employee well-being.

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