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Type A behavior and work situation: Associations with burnout and work engagement

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The aim of the present study was to investigate Type A behavior as well as perceived work situation, and associations with burnout and work engagement. The associations in focus were investigated through hierarchical regressions in a sample (N = 329) of Swedish Information Communication Technology consultants. The findings indicated that both work situation and Type A behavior was correlated with work engagement and burnout; however, no interactions between Type A behavior and work situation were elicited. The main conclusion was that the achievement striving aspect of Type A behavior appears as "non-toxic" and is related only to work engagement. However, the irritability/impatience aspect appears to be responsible for burnout complaints among Type A individuals, possibly through negative effects of the mood itself than through perceived stress at work.

Key words: Work engagement, burnout, Type A behavior, job demands and resources, interaction effects.

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INTRODUCTION

Burnout is described as a syndrome primarily characterized by emotional exhaustion and disengagement from work (Demerouti, Bakker, Nachreiner & Schaufeli, 2001). This syndrome has gained a considerable amount of attention over the past decades, in parallel with the increase of work-related stress complaints (Schaufeli & Enzmann, 1998). Most models of the etiology of burnout emphasize initial motivation and engagement (Schaufeli & Enzmann, 1998). "In order to burn out, one has first to be 'on fire'" (see Pines, 1993, p. 41). However, it was only recently that work engagement was empirically included in burnout research, and also approached as a concept in its own right (see Maslach, Schaufeli & Leiter, 2001). Schaufeli, Salanova, Gonzalez-Romá and Bakker (2002) have defined work engagement as "a positive fulfilling work-related state of mind that is characterized by vigor, dedication and absorption" (p. 74). Preliminary evidence (González-Romá, Schaufeli, Bakker & Lloret, 2005) suggest that the concept of work engagement reflects the "opposite" of burnout.

The Job Demand-Resources (JD-R) model (Demerouti *et al*., 2001) posits that work engagement is enhanced by available job resources (e.g. autonomy). In contrast, lack of job resources and/or the presence of job demands (e.g. work load) instead induce burnout. This model has gained empirical support in several studies (e.g. Hakanen, Bakker & Schaufeli, 2006; Schaufeli & Bakker, 2004). Hence, we expected a high level of autonomy to be associated with high levels of work engagement, and low levels of burnout (*Hypothesis 1a*), whereas workload was expected to be positively associated with burnout and negatively associated with work engagement (*Hypothesis 1b*).

However, human beings are not merely passive pawns and employees are not moved around by external incentives only. They participate with their own different personal motives, approaches and coping styles, both in terms of attitudes and behaviors. Nevertheless, Cooper, Dewe and O'Driscoll (2001) state that most empirical studies on occupational health are concerned with the effect of workplace variables on employee well-being, and relatively seldom with the effect of personal variables on employee well-being. Interaction effects are more seldom investigated, also in the specific area of burnout research (Maslach *et al*., 2001; Shirom, Melamed, Toker, Berliner & Shapira, 2005). The present study aims to investigate the associations between Type A behavior, autonomy and workload, and work engagement as well as burnout.

Previous research on burnout indicates that one's personal approach to work is significant to developing this syndrome. Hallsten, Josephson and Torgén (2005) established that individuals using performance at work as a measure of personal value are more vulnerable to burnout than individuals who have a non-contingent sense of self-worth. Type A behavior has been previously linked to over-achievement in approaching and managing tasks (Perez-García & Sanjuán, 1996; Preckel, von Känel, Kudielka & Fischer, 2005; van den

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Berg & Schalk, 1997) and it has also been linked to burnout (Maslach *et al*., 2001).

Type A behavior pattern

The label "Type A behavior" is used to describe a behavioral pattern combining ambition, competitiveness, time urgency, impatience and hostility (Friedman & Rosenman, 1974; Krantz, Lundberg & Frankenheuser, 1987). Sturman (1999) describes Type A behavior as extrinsically motivated behavior, ultimately guided by the purpose of attaining approval from others. Similarly, Hallsten *et al*. (2005) describe Type A behavior as an "anxious engagement". That is, a negatively charged involvement in work utterly fuelled by a need for approval.

Although Type A behaviour was introduced as a global construct, more recent research (Barling & Charbonneau, 1992; Day & Jreige, 2002; Spence, Helmreich & Pred, 1987) has acknowledged two principal dimensions of the Type A construct: achievement striving and irritability/impatience. These dimensions have been found to be differently related to health and performance (Edwards, Baglioni & Cooper, 1990; Kivimäki, Kalimo & Julkunen, 1996). Therefore, Barling and Charbonneau (1992) recommend an acknowledgment of the underlying dimensionality when performing research on Type A behavior. However, in most previous research on burnout and Type A behavior, the global concept of Type A is employed (Jamal & Vishwanath, 2003).

According to several studies (Barling & Charbonneau, 1992; Perez-García & Sanjuán, 1996; Spence *et al*., 1987), Type A individuals appear as more achievement striving than individuals not displaying typical Type A behavior patterns, and they are also excellent performers. Based on their findings, Preckel *et al*. (2005) argue that the most likely explanation to why Type A individuals excel are to be found in their overcommitment – they try harder, hence maximize their chance for a successful outcome. Empirically, the achievement striving component of Type A behavior has been related to performance and high job satisfaction but no associations with health deterioration has been established (see Day & Jreige, 2002; Mellam & Espnes, 2003; Spence *et al*., 1987). Therefore, we anticipated achievement striving (*Hypothesis 2a*) to be positively correlated with work engagement (as the latter concept also manifest in ambition and excel; see Schaufeli & Salanova, in press).

However, Type A behavior has also been related to a range of health complaints, for example cardiovascular disease (Miller, Smith, Turner, Guijarro & Hallet, 1996), psychosomatic complaints (Barling & Charbonneau, 1992; Jamal, 1990), vital exhaustion (Appels, Falger & Schouten, 1993), and burnout (Jamal & Vishwanath, 2001; Maslach, 1985; Nowack, 1987). A number of studies (Barling & Charbonneau, 1992; Bluen, Barling & Burns, 1990; Day & Jreige, 2002; Kivimäki *et al*., 1996; Miller *et al*., 1996; Spence *et al*., 1987) report that the association between Type A behavior and ill-health is primarily accounted for by the irritability/impatience dimension. Thus, a positive correlation between irritability/impatience and burnout was expected (*Hypothesis 3a*). There are, however, no previous studies reporting on the empirical association between Type A behavior and the construct of work engagement. Conceptually, irritable and impatient behavior (aspects that connote the typical hostility behavior of Type A individuals) is not compatible with the feelings of vigor, dedication and absorption that constitute the experience of work engagement. Thus, an *ad hoc* expectation that irritability/impatience would be negatively correlated with work engagement was formulated (*Hypothesis 3b*).

Interactions between Type A behavior and the job situation?

Krantz *et al*. (1987) discuss the significance of person-environment fit in terms of Type A behavior and well-being. They suggest that adequate resources (e.g. autonomy) could very well moderate harmful effects of Type A behavior on well-being and enhance involvement and motivation. It has been noted (Perez-García & Sanjuán, 1996; van den Berg & Schalk, 1997) that Type A individuals maximize their efforts also when not especially called for, for example, when no deadline was due (contrary to non-Type A individuals who were found to maximize effort *only* when especially called for, e.g. to meet a deadline). Thus, a flexible and more autonomous work may be additionally supportive to Type A individuals in their strive to perform and satisfy needs for achievement. It was expected that high levels of autonomy among individuals reporting more frequent Type A behavior would elicit higher work engagement (and lower burnout) than among Type A individuals reporting lower autonomy (*Hypothesis 4*). However, turned around, this argument implies that job demands frustrating the striving towards excellence and perfection would instead enhance the risk for frustrations that in turn may generate ill-being and health complaints. A previous study (Kirmeyer & Biggers, 1988) found that Type A individuals experience and rate situations as more demanding than non-Type A individuals, as well as generate more job demands for themselves. Hence, it was expected that high workload would elicit more burnout in Type A individuals than among non-Type A individuals reporting high job demands (*Hypothesis 5*).

METHOD

Subjects and procedure

The data from the present study was collected as part of a larger project on motivation and health among Information Communication Technology (ICT) and management consultants. The study was designed in cooperation with the personnel management of the Swedish division of an international ICT company. A questionnaire containing established scales assessing individual factors (Type A behavior), job factors and well-being at work (e.g. work engagement and burnout) was distributed to every third employee in the company

Table 1. *Adjectives of the TASRI (Blumenthal* et al.*, 1985) categorized into achievement striving and irritability/impatience dimensions of Type A behaviour*

Achievement striving factor	Irritability/impatience factor
Energetic	Aggressive
Fast	Tense
Powerful	Easily annoyed
Enterprising	Self assertive
Enthusiastic	Easily irritated
Ambitious	Loud
Eager to discuss	
Individualistic	
Talkative	
Extraverted	
Strong	

(N = 521) by mail to their home addresses. A letter emphasizing voluntary participation and confidentiality of the participants accompanied the questionnaire. The letter included instructions to send back the questionnaires directly to the research team in reply postage-paid envelopes to further secure the confidentiality of the participant's replies. Four follow-up mailings were administered to increase the total response rate, which amounted to 63%. The final sample (N = 329) was composed of ICT software developers, ICT support, ICT programmers, project managers, management consultants and administrators. Mean age was 40 years (SD = 9), and the average tenure was 7 years (SD = 7). The proportion of female respondents was 36%.

Measures

Type A behavior was assessed with the adjective checklist (TASRI; Blumenthal, Herman, O'Toole, Haney, Williams & Barefoot, 1985). The TASRI constitutes a short-version of the Jenkins Activity Service (JAS), suitable for inclusion in large questionnaires. Convergent validity between the JAS and the TASRI has been shown to be good (Blumenthal *et al*., 1985). The respondents were asked to score how well a series of adjectives corresponded with their usual behavior on a frequency scale (response alternatives were given on a Likert scale ranging from ranging from 0 = "never" to 6 = "every day"). Example adjectives were "ambitious", aggressive", "easily annoyed" (more examples are displayed in Table 2).

However, although the JAS has been factor analyzed (Spence *et al*., 1987) with respect to its reflection of the two underlying dimensions of Type A behavior, to the extent of the authors' knowledge, no such factor analyses of the TASRI has been undertaken. In the present study, a two-step approach towards detecting such a dimensionality was employed.

In the first step, the adjectives were divided by face validity into two categories (achievement striving and irritability/impatience). Each adjective was scrutinized and referred to the most appropriate category (18 adjectives in total, see Table 1). Three adjectives were excluded from the categorization (openhearted, confident, and stubborn) as they did not appear to correspond well to either of the categories.

In step two, this categorization was tested using a Confirmatory Factor Analyses (CFA) in LISREL 8 (Jöreskog & Sörbom, 1993). In the CFA, the global Type A (uni-dimensional) representation was contrasted with the two-dimensional solution. Fit statistics for *global Type A behavior* (d.f. 135; Chi-square 1264.02; RMSEA 0.16; ECVI 4.10; NFI 0.69; CFI 0.72; SRMR 0.12) and a *two-dimensional solution* (achievement striving, and irritability/impatience) (d.f. 118; Chi-square 487.07; delta Chi-Square 776.95; RMSEA 0.10; ECVI 1.71; NFI 0.83; CFI 0.86; SRMR 0.10) indicated that a two-dimensional representation better fitted the empirical data-matrix. Cronbach's alpha showed adequate internal consistency for both the global measure (0.85) and for the sub-components achievement striving (0.79) and irritability/impatience (0.75).

Autonomy and workload were measured by the use of five-point Likert scales ranging from 1 ("strongly disagree") to 5 ("strongly agree"). *Autonomy* was assessed with four items (e.g., "I can make my own decisions on how to organize my work"), derived from different autonomy scales (Hackman & Oldham, 1975; Walsh, Taber & Beehr, 1980). The autonomy scale has been previously used and validated on Swedish data (see Sverke & Sjöberg, 1994) and attained an alpha value of 0.69. *Workload* (having too much to do in the time available, in accordance with the definition by Beehr, Walsh & Taber, 1976) was measured with three items (e.g., "I often have too much to do at work"). These items came from different role overload scales (Beehr *et al.*, 1976; Nystedt, 1992; Sverke & Sjöberg, 1994) and obtained a Cronbach's alpha of 0.90.

Work engagement (e.g. "I'm bursting with energy in my work", "I am enthusiastic about my job", "I get carried away by my work), was captured using a nine-item short version (see Schaufeli, Bakker & Salanova, 2006) of the Swedish translation of the Utrecht Work Engagement Scale (UWES; Schaufeli, Taris, Le Blanc, Peeters, Bakker & De Jonge, 2002). A previous study (Hallberg & Schaufeli, 2006) indicated that the inter-correlations among the subscales of work engagement were very high and that the uni-dimensional representation of work engagement evidenced an equivalent fit to data compared to the original three-factor solution. Hence, work engagement was conceptualized as a uni-dimensional construct for practical reasons (see recommendations by Schaufeli *et al.*, 2006). Cronbach's alpha of the work engagement scale was 0.89. The engagement items were similarly scored as those assessing burnout. Following general practice, items assessing burnout and work engagement were randomly mixed to avoid response bias. Descriptive statistics and correlations for all study variables are presented in Table 2.

Burnout was assessed using two subscales (emotional exhaustion and cynicism) from a Swedish version of the Maslach Burnout Inventory-General Survey (MBI-GS; Maslach, Jackson & Leiter, 1996) designed to assess burnout outside human service occupations. Previous studies (Lee & Ashforth, 1996; Schaufeli & Bakker, 2004) have indicated that these dimensions constitute the core aspects of burnout. Emotional exhaustion (Cronbach's alpha 0.81) was assessed with five items (e.g. "I feel used up at the end of a work day") and cynicism (Cronbach's alpha 0.76) was assessed with another five items (e.g. "I just want to do my job and not be bothered with anything else"). The MBI-GS instruct respondents to indicate their answers on a seven-point Likert scale with frequency ratings ranging from 0 ("never") to 6 ("always").

Data analyses

All hypotheses were tested using hierarchical regression analyses. The interaction terms were created by centering the predictor variables (the mean was set to zero, standard deviation left unaffected) as recommended by Aiken and West (1991). The interaction terms were stepwise included in the last step of the regression equation.

RESULTS

First, Hypotheses 1–3 were investigated concentrating on the direct effects of job factors (autonomy and workload) as well as the sub-dimensions of Type A behavior on work engagement and burnout. The results are displayed in Table 3.

Table 2. *Means (standard deviations), scale range and correlations of all study variables (*N = *328)*

	Mean	(SD)	Scale range	1	2	3	(a)	(b)	4	5	6
1. Autonomy	3.46	0.69	1–5	1.00							
2. Workload	3.20	0.90	1–5	–0.08	1.00						
3. Type A behavior	3.61	0.60	0–6	0.11**	0.15*	1.00					
(a) Achievement striving	4.31	0.66	0–6	0.15**	0.14*	0.89**	1.00				
(b) Irritability/impatience	2.08	0.83	0–6	–0.06	0.14**	0.67**	0.30**	1.00			
4. Work engagement	3.73	0.89	0–6	0.36**	0.11*	0.21**	0.36**	–0.14**	1.00		
5. Emotional exhaustion	2.39	1.11	0–6	–0.26**	0.41**	0.13*	–0.01	0.34**	–0.33**	1.00	
6. Cynicism	2.49	1.09	0–6	–0.31**	0.03	0.08	–0.05	0.28**	–0.55**	0.49**	1.00

Table 3. *Hierarchical regressions analyses of the associations between (a) autonomy, workload and the dimension of Type A behavior (achievements triving and irritability/impatience) and (b) work engagement and burnout (*N = *328, pairwise deletion)*

	Work engagement			Emotional exhaustion			Cynicism		
Independent variables	*Step 1*	*Step 2*	*Step 3*	*Step 1*	*Step 2*	*Step 3*	*Step 1*	*Step 2*	*Step 3*
Autonomy	0.36***	0.35***	0.29***	–0.23***	–0.23***	–0.20**	–0.31***	–0.31***	–0.28***
Workload	0.14**	0.10	0.12*	0.39***	0.39***	0.36***	0.01	0.01	–0.02
Achievement striving		0.30***	0.37***		–0.03	–0.12*		–0.01	–0.10
Irritability/impatience			–0.26***			0.31***			0.30***
R^2 Adj	0.14**	0.22***	0.28***	0.22***	0.22***	0.30***	0.09***	0.09***	0.16***
ΔR^{2-}	–	0.08***	0.06***	–	0.00	0.08***	–	0.00	0.07***

In the initial step of the regression, autonomy and workload were regressed on work engagement, on emotional exhaustion and on cynicism respectively. Together, they explained 14% of the total variance in work engagement, 22% of the variance in emotional exhaustion and 9% of the variance in cynicism. As expected in Hypothesis 1a, autonomy was positively associated with work engagement and negatively associated with burnout. Hence, our first assumption was supported. Workload, however, evidenced a *positive* association with work engagement – contrary to expectations. When regressed on burnout, workload evidenced a positive association with emotional exhaustion but was found unrelated to cynicism. Hence, Hypothesis 1b was not supported as only one out of three expected associations was significant.

Next, the achievement striving dimension of Type A behavior was entered in the regression. Achievement striving added to the amount of explained variance in work engagement by 8% but did not explain any variance at all in burnout. Hypothesis 2a was thus supported, as achievement striving evidenced a positive association with work engagement. In addition, achievement striving was found to be unrelated to both dimensions of burnout.

Lastly, irritability/impatience was added to the regression. This dimension of Type A behavior explained an additional 6% of the variance in work engagement, and evidenced a negative association consistent with our *ad hoc* expectations formulated in Hypothesis 3b. Irritability/impatience also explained additional variance in burnout, 8% in emotional exhaustion and 7% in cynicism. Consistent with Hypothesis 3a, a positive association between irritability/impatience and burnout was established.

Hypotheses 4–5 focused on the interactions between Type A behavior and autonomy as well as workload on work engagement and burnout respectively. Results are displayed in Table 4.

In the first step, autonomy and workload were entered. The second step included Type A behavior (results for the global construct are displayed in Table 4, however analyses including both the global construct and the sub-dimensions were also performed). Type A behavior was regressed on work engagement, emotional exhaustion and cynicism respectively. The global construct of Type A behavior was positively associated with both work engagement and burnout but explained only an additional 2% of the total variance in work engagement, no additional variance in emotional exhaustion and only one additional variance in cynicism. Thereafter, interaction terms between (a) Type A behavior and autonomy, and (b) Type A behavior and workload were entered in the regression. No significant interactions could be established.

DISCUSSION

The associations between work situation (extrinsic variables) *as well as* individual behavior (intrinsic variables) and

Table 4. *Hierarchical regression analyses of associations between achievement striving and irritability/impatience on the dependent variables (work engagement, emotional exhaustion and cynicism;* N = *328)*

	Work engagement			Emotional exhaustion			Cynicism		
Independent variables	*Step 1*	*Step 2*	*Step 3*	*Step 1*	*Step 2*	*Step 3*	*Step 1*	*Step 2*	*Step 3*
Autonomy	0.36***	0.35***	0.32***	–0.23***	–0.25***	–0.20**	–0.31***	–0.32***	–0.30***
Workload	0.14**	0.12*	0.16*	0.39***	0.37***	0.35***	0.01	–0.02	–0.10
Type A behavior (*global*)		0.15**	0.15**		0.11*	0.10*		0.12*	0.13*
Type A * Workload[a]			–0.07			0.04			0.13
Type A * Autonomy			0.03			–0.07			–0.04
R^2 Adj	0.14**	0.16**	0.16*	0.22***	0.23***	0.23***	0.09***	0.10***	0.11***
ΔR^{2-}	–	0.02**	0.00	–	0.01*	0.00	–	0.01*	0.03

Notes: [a] Analyses of interaction terms between Type A behavior and work factors were replicated replacing the global Type A construct with the sub components (achievement striving and irritability/impatience) respectively. No significant interactions were yielded.
Levels of significance: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

occupational health constituted the starting point of the present study. Most previous empirical studies on work engagement and burnout have focused on work situation alone (Maslach *et al.*, 2001). However, we argued that individual behavior may additionally contribute to understanding work engagement and burnout.

According to the JD-R model (Demerouti *et al.*, 2001), job resources are primarily associated with work engagement, whereas job demands are primarily associated with burnout complaints. These associations were expected to be replicated in the present study (Hypotheses 1a and 1b), and so they were with an interesting and unexpected addition. Consistent with the JD-R model, employees reporting a higher level of autonomy (*a job resource*) also reported higher levels of work engagement (and lower levels of burnout complaints). Employees reporting high levels of workload (*a job demand*) also – as expected – reported a higher level of emotional exhaustion; however, no association between workload and cynicism was established. In addition, we also found a positive association between workload and higher level of work engagement. The JD-R model posits no such correlation between job demands and work engagement; however, the association is plausible from a theoretical viewpoint. The quote "in order to burn out, one has first to be 'on fire'" (Pines, 1993, p. 41) implies that burnout occurs among employees that are highly engaged in their work. An in-depth interview study with highly engaged employees (Schaufeli *et al.*, 2001) concluded that work engaged employees were assertive and "active agents", prone to extra role behavior. To volunteer for additional work tasks, therefore, seems a highly likely behavior for employees high in work engagement. However, accepting an increasing workload also increases the vulnerability for burnout (at least exhaustion), especially if exceeding the "breaking point" where available resources are no longer sufficient to solve the work tasks at hand.

The JD-R model is limited to describing associations between work variables, work engagement and burnout. In order to achieve a more complex and comprehensible understanding of work engagement and burnout the present study also investigated an individual variable (Type A behavior). Previous studies (Day & Jreige, 2002; Spence *et al.*, 1996) have concluded that Type A behavior has two major underlying components: achievement striving and irritability/impatience. These dimensions also appear to be differently involved in the stressor-strain process (Kivimäki *et al.*, 1996) and findings from the current study support that they are also differently associated with work engagement and burnout. We anticipated that achievement striving would be positively associated with work engagement (Hypothesis 2a), but unrelated to burnout (as non-existing associations are not suitable for empirical validation, we did not formulate a testable hypothesis for this assumption). Hence, employees who were prone to frequent achievement striving behavior were more likely to be engaged in their work but they did *not* report burnout complaints, indicating that achievement striving is a "non-toxic" component of Type A behavior. In accordance with Hypothesis 3a, Type A individuals reporting more frequent irritability/impatience behavior also reported more frequent burnout complaints. Since the present study was cross-sectional, it was not possible to interpret whether irritable and impatient behavior increase as burnout develops, or if irritability and impatience predict burnout. A previous review (se Miller *et al.*, 1996) has concluded that irritability/impatience (especially hostility) may cause health problems. Hence, a possible interpretation of our findings is that irritable and impatient behavior may exhaust one's mental resources and induce emotional exhaustion and cynicism. However, this is an assumption that should be tested using longitudinal data in future research.

As no previous studies had tested the empirical associations between Type A behavior and work engagement, we formulated *ad hoc* that irritability/impatience would be negatively associated with work engagement (Hypothesis 3b). This assumption was based on the dissimilar conceptual meanings of the two constructs (work engagement as form

of intrinsic motivation, see Schaufeli & Salanova, in press; and Type A behavior as a form of extrinsic motivation, see Sturman, 1999). Our assumption was empirically supported by data. Because of the study's cross-sectional nature, it was not possible to establish whether this association was the result of a *loss of* work engagement due to irritability/impatience. That is, we cannot conclude that individuals reporting higher irritability/impatience were not previously highly work engaged. Theoretically, it is plausible that irritable and impatient behavior increase under pressure. If so, Type A individuals may be "initially" highly work engaged but become more irritable and impatient when subject to work stress. Irritability/impatience may then function as an additional stressor, inducing burnout. However, although Type A behavior and work engagement are correlated concepts (0.36***, see Table 2), they shared only 13% of common variance. And with respect to their inherently different conceptual profiles it is more likely that Type A individuals – especially when prone to irritability/impatience – are by nature less work engaged. Finally, according to Krantz *et al*. (1987), Type A behavior is a rather stable pattern of behavior, possibly established through early childhood socialization (e.g. through reinforcement). Work engagement, on the other hand, is defined as a work-related state of well-being (Schaufeli *et al*., 2002), hence it appears as more likely that Type A behavior would affect work engagement.

A major point of the present study was to investigate interactions between the work situation and Type A behavior, and how this interaction might additionally affect work engagement and burnout. It was assumed that high levels of autonomy would elicit higher work engagement (and lower burnout) among Type A individuals (Hypothesis 4), as it has been proposed that autonomy may moderate harmful effects of Type A behavior (Krantz *et al*., 1987). However, no such interactions were established in the present study. Analyses were performed both with the global measure of Type A behavior and the sub-scales measuring achievement striving and irritability/impatience. Moreover, we expected an interaction between workload and Type A behavior to affect levels of work engagement and burnout (Hypothesis 5) but neither such an interaction could be established.

A *lack of* interactions is difficult to interpret, but it appears as Type A individuals are vulnerable to burnout through their display of irritable and impatient behavior alone. Based on previous findings (Kirmeyer & Biggers, 1988) it was proposed that Type A individuals would display a more aggressive work style, taking on more work load but also perceive more job stress than non-Type A individuals. However, in the present study, only a weak, positive correlation (0.15**) between Type A behavior and workload was evidenced. This implies that the Type A individuals in the present sample did not differ very much from the non-Type A individuals in how they perceive their work situation with respect to workload. Following from this we reason that as their perception of workload does not differ dramatically – the moderating benefits attained from a high autonomy would also be less obvious and that this (sample specific?) circumstance may explain the lack of expected interactions.

Methodological concerns and future research

The major limitation of the present study was its cross-sectional design. We recommend future studies to use longitudinal data to explore the processes involved in Type A behavior, work engagement and burnout to shed light on questions like "does Type A behavior become more or less pronounced as burnout develops?", or if the sub-dimensions play different roles in the processes of developing engagement and burnout. A principal finding of the present study was that Type A behavior – in this study – was primarily associated with high levels of work engagement, contributing to the body of research finding Type A behavior to be related to *positive* aspects of occupational health (Barling & Charbonneau, 1992; Day & Jreige, 2002; Perez-García & Sanjuán, 1996; Spence *et al*., 1987). Future studies may use this finding to develop more refined strategies for HRM practice, based on optimal functioning rather than focusing on health deterioration (cf. Seligman & Csikzentmihalyi, 2000).

Future studies should also employ, for example, structured interviews to assess Type A behavior. The present study relied exclusively on self-report data, making the results vulnerable to common method bias (Campbell & Fiske, 1959). Moreover, Blumenthal *et al.* (1985) noticed that the assessment of Type A behavior with self-report questionnaires tend to adequately capture achievement striving, whereas irritability/impatience tend to be under-reported due to social desirability in self-report measures. Hence, it is likely that the association between irritability/impatience and burnout is under-reported. Possibly, another methodological approach would also succeed in capturing an interaction between Type A behavior and perceived work situation affecting levels of burnout.

For future research directions, we call for more studies exploring different aspects of work attachment styles, including Type A behavior and work engagement. How and why are they different (or similar) concepts, and does it matter in terms of health what kind of attachment style one embraces?

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