Modeling self-determination in employee responses to work

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ABSTRACT

Based on self-determination theory and models of demands and resources at work, path analysis of survey data ($N = 1008$) was used to test a model of motivational and health-related responses to work characteristics. Work-related resources and stressful demands were framed as features that facilitate, respectively constrain the fulfillment of basic psychological needs for autonomy, competence, and relatedness. Motivational and health impairment processes were represented by distinct first-order (work motivation, work strain) and second-order outcomes (affective commitment, psychosomatic symptoms). Workplace alienation was confirmed as a shared second-order outcome of low motivation and high strain. Individual autonomy orientation affected employee responses as expected. Limitations, theoretical issues, and implications for work design are discussed.

Keywords
Self-determination – demands – resources – motivation – health impairment

What makes work motivating and rewarding or stressful and health-impairing are core questions of work design (Hacker & Sachse, 2014). Classic answers are offered by the job characteristics model (JCM) and the job demand-control model (JDCM). According to the JCM (Hackman & Oldham, 1976), determinants of work motivation are job autonomy, feedback from the task, skill variety, task identity, and task significance (Fried & Ferris, 1987). The JDCM (Karasek, 1979) emphasizes health-impairing effects of job demands, especially when combined with a lack of personal discretion and social support (van der Doef & Maes, 1999). The more recent job demands-resources model (JDRM) integrates positive and negative perspectives (Bakker & Demerouti, 2007; Schaufeli & Bakker, 2004). *Job demands*, such as work overload, conflicting requirements, and social stressors, are defined as factors that interfere with the attainment of work goals and incur psychological and/or physical efforts and costs. *Job resources*, such as autonomy, learning opportunities, and social support, are deemed helpful in attaining work goals, coping with demands, and achieving learning and growth. Demands and resources are as-

sumed to evoke distinct responses (Schaufeli & Bakker, 2004). Accordingly, resources stimulate a motivational process, inducing positive states and attitudes, such as work engagement, whereas demands trigger an effort-driven process, leading to burnout and impaired psycho-physical health. Research on the JDRM has been prolific, but not without limitations. Similar to the JDCM, the JDRM postulates interactive effects of demands and resources (Bakker & Demerouti, 2007). Cumulative evidence for such interactions, however, has been judged as inconsistent (de Lange, Taris, Kompier, Houtman & Bongers, 2003; van der Doef & Maes, 1999). Treatment of demands and resources as aggregated higher-order factors holds disadvantages with regard to heterogeneous factor composition across studies, abstractness of results, and resulting ambiguity with regard to specific work features. While existing research strongly focuses on burnout and its conceptual antipode, work engagement, alternative motivational and strain-based outcomes have largely been neglected. Finally, the JDRM lacks a strong theoretical basis (Bakker & Demerouti, 2007). Well-established in social psychology, Self-determination theory

(SDT), has been suggested as a complementary framework (van den Broek, Vansteenkiste, de Witte & Lens, 2008). Yet, so far, the integration of JDRM and SDT as well as the uptake of SDT in work design research in general has been limited (Gagné & Deci, 2005).

In this study, core assumptions of JDRM and SDT are integrated and tested in a path model based on survey data of $N = 1008$ public employees. Unlike mainstream JDRM research, which typically investigates interactive effects of broader bundles of job demands and resources, SDT is used to expound on the *differential* consequences of specific work features. Job resources and demands were framed as work characteristics that support, respectively constrain the fulfillment of psychological needs for autonomy, competence, and relatedness. Motivational and health-impairment processes were represented by first-order (intrinsic work motivation and psychological work strain) and second-order (affective organizational commitment and psychosomatic symptoms) outcomes. Autonomy orientation was included as an individual disposition and workplace alienation as a shared second-order outcome of negative motivational and strain responses. Advancing the integration of JDRM and SDT contributes to theory building. Drawing on an alternative taxonomy of demands and resources and a different set of motivational and health-related outcomes, the dual-process assumption is extended beyond the dichotomy of burnout and engagement.

Hypotheses

Motivational Process

Intrinsic motivation refers to the extent to which behavior is driven by spontaneous interest and satisfaction derived from an activity (Gagné & Deci, 2005). Employed work is first and foremost externally motivated, but task characteristics and contextual features can stimulate „quasi-intrinsic" or „autonomous" work motivation (Humphrey, Nahrgang & Morgeson, 2007). Organismic integration theory, a sub-theory of SDT, describes how external control is transformed into more autonomous regulation through psychological internalization (Ryan & Deci, 2000). Progressing from extrinsic to introjected, identified, integrated, and intrinsic motivation, external motives are personally accepted, valued, and assimilated into the self-concept. Self-determined work motivation thus refers to the extent to which work goals are internalized and work activities are autonomously regulated (Baard, Deci & Ryan, 2004; Lam & Gurland, 2008). Basic needs theory, the most central component of SDT, postulates that internalization is a function of the experience of autonomy, competence, and relatedness (Ryan & Deci, 2000).

By facilitating these experiences, job resources can thus be framed as conditions that support the fulfillment of these basic needs (van den Broek, et al., 2008). In the present study, work characteristics chosen as job resources were: a) *Task autonomy* (discretion and freedom in how to carry out the work); b) *learning opportunities* (possibilities to develop new knowledge, skills, and abilities); and c) *cooperation requirements* (work-related collaboration and social interaction). Promoting self-determined regulation of work activities, these factors can indirectly contribute to generalized forms of involvement in and positive attachment to the workplace, based on the internalization of broader organizational objectives (Gagné & Deci, 2005; Gagné, Chemolli, Forest & Koestner, 2008). Corresponding with SDT, the first hypothesis posits that autonomous work motivation is a proximal (first-order) response to work design that supports basic need satisfaction, whereas affective organizational commitment is a more distal (second-order) outcome in the motivational process.

> *Hypothesis 1: Task autonomy (H1a), learning opportunities (H1b), and cooperation requirements (H1c) will relate positively to work motivation, which, in turn, will relate positively to affective commitment (H1d).*

Health-Impairment Process

Job strain and health impairment represent the dark side of work. Manifestations range from short-term cognitive and affective responses to chronic psychophysical symptoms (Glaser, Seubert, Hornung, & Herbig, 2015; Höge, 2009; Nixon, Mazzola, Bauer, Krueger & Spector, 2011). Impeding the pursuit and/or attainment of work goals, demands or stressors can be framed as conditions that constrain the fulfillment of work-related psychological needs (Oesterreich & Volpert, 1986; van den Broek et al., 2008). Following SDT, for the present study stressors were selected on the basis that they pose hindrances to the experience of autonomy, competence, and relatedness at work. Specifically, this refers to: a) *Work overload* (i.e., pressure to accomplish more work than feasible at a normal and sustainable pace); b) *learning constraints* (i.e., obstacles or lack of opportunity for the use and acquisition of knowledge and skills); and c) *communication problems* (i.e., lack of information required from others to accomplish the work). Based on the JDRM, it was expected that these demands would not primarily erode work motivation, but rather trigger a relatively independent health-impairment process (Schaufeli & Bakker, 2004). According to classic postulates on the etiology of work-related health problems (Frese, 1985),

this process is assumed to progress from cognitive and emotional work strain, experienced in the short- to medium term, to more severe and generalized psychosomatic symptoms in the longer run. Thus, the following first- and second-order outcomes were assumed to reflect a potential health-impairment process.

> *Hypothesis 2: Work overload (H2a), learning constraints (H2b), and communication problems (H2c) will relate positively to work strain, which, in turn, will relate positively to psychosomatic symptoms (H2d).*

Autonomy Orientation

Individual differences are widely assumed to influence both motivational and strain-based processes. SDT's causality orientations theory posits that some individuals are more likely to experience autonomous motivation, based on a dispositional tendency to perceive social contexts as autonomy-supportive and their own actions as self-determined (Lam & Gurland, 2008). Likewise, stress research has long emphasized the importance of related personal characteristics, such as dispositional optimism, generalized self-efficacy, and locus of control, in adopting active and problem-focused coping strategies to constructively deal with adverse situations (e.g., Connor-Smith & Flachsbart, 2007; Jex, Bliese, Buzzell & Primeau, 2001). In addition to facilitating intrinsic motivation, autonomy orientation should also increase resilience to work strain by promoting an active approach to work and inoculating individuals against experiencing situations as beyond their influence (Frese, Garst & Fay, 2007; Martinko & Gardner, 1982). To test these assumptions, autonomy orientation was included as a predictor of both work motivation and strain.

> *Hypothesis 3: Autonomy orientation will relate positively to work motivation (H3a) and negatively to work strain (H3b).*

Workplace Alienation

Work alienation is a classic topic in organizational research. Rooted in the social critique of employment, alienation is also used broadly for various forms of disengagement from the work role due to lacking fulfillment of job-related needs (Hirschfeld & Feild, 2000; Kanungo, 1979). Central to the concept of alienation is the notion of powerlessness, helplessness, or loss of control (Seeman, 1983). In this study, workplace alienation was framed as a form of dysfunctional attachment to the organization, characterized by negative af-

fect and perceived incapacity to enact positive changes or to find alternative employment (Penley & Gould, 1988). An amotivated and adverse psychological state, alienation is suggested as a longer-term response at the intersection of motivational and health-impairment process (Martinko & Gardner, 1982). Specifically, it was expected that workplace alienation would be predicted by low intrinsic motivation and high strain (Banai & Reisel, 2008). Individuals high in autonomy orientation should be less at risk to develop symptoms of disengagement and helplessness, due to their tendency to feel and act in charge of the situation (de Man & Devisse, 1987). The fourth hypothesis reflects these considerations.

> *Hypothesis 4: Work motivation (H4a) and autonomy orientation (H4b) will relate negatively and work strain positively (H4c) to workplace alienation.*

Method

Sample

Analyses were based on a sample of N = 1008 German government employees. Participants were tenured civil servants, performing clerical and accounting tasks in different regional branches of the administration, including fieldwork at corporate clients and personal home-offices (Hornung, Herbig & Glaser, 2008). With 27.5 % women were a minority, mean age was 43.56 years (SD = 8.37), and 18.8 % worked part-time (less than 40 h/wk).

Measures

Work characteristics. Six 4-item scales were adapted from an established self-report instrument (Büssing & Glaser, 2000; Glaser et al., 2015). Job resources were represented by three scales with theoretical links to needs for autonomy, competence, and relatedness: *a) task autonomy* (e.g., „This work offers discretion to decide how to get tasks done"; α = .76); *b) learning opportunities* (e.g., „This work provides opportunity to expand one's theoretical knowledge"; α = .73); and *c) cooperation requirements* (e.g., „This work requires close cooperation with coworkers"; α = .71). The remaining three scales were selected as job demands (or stressors), assumed to constrain or hinder the fulfillment of respective needs: *d) work overload* (e.g., „Frequently, there is too much work to do at once"; α = .71); *e) learning hindrances* (e.g., „There is little opportunity to learn new working methods"; α = .70); and *f) communication problems* (e.g., „Information needed to do the work is frequently not available"; α = .71). Unless

indicated otherwise, measures used a 5-point Likert scale from 1 = „Not at all" to 5 = „To a very great extent".

Work motivation. The 6-item scale by Warr, Cook and Wall (1979) assessed intrinsic or autonomous work motivation. Sample items are: „I feel a sense of personal satisfaction when I do my job well" and „I take pride in doing my job as well as I can" (α = .73).

Affective commitment. The 5-item moral commitment scale by Penley and Gould (1988) captured affective attachment to the workplace and identification with organizational goals. Sample items are: „I am dedicated to this organization" and „It is my personal responsibility to help this organization achieve success" (α = .73).

Work strain. The irritation scale taps short- to medium-term symptoms of psychological work strain (Mohr, Müller, Rigotti, Aycan & Tschan, 2006). Three items refer to the cognitive component of ruminating thoughts (e.g., „Even at home I often think of my problems at work") and five items to the emotional component of affective irritability (e.g., „I get grumpy when others approach me"). These two dimensions were combined into a composite measure of cognitive and emotional work strain (α = .89).

Psychosomatic symptoms. Somatic symptoms were assessed with 28 items from the Freiburg Complaint List (Fahrenberg, 1995), based on a 5-point frequency scale (1 = „Never" to 5 = „Almost every day"). Exploratory factor analysis indicated five symptom domains: *a) general condition* (5 items; e.g., „Do you have a cold? "); *b) tiredness* (7 items; e.g., „Do you feel tired and run-down all day? "); *c) gastrointestinal* (4 items; e.g., „Do you have a sensitive stomach? "); *d) cardiovascular* (8 items; e.g., „Do you have chest pain? "); and *e) musculoskeletal* (4 items; e.g., „Do you have back pain? "). In scale analyses, these factors were included as parcels and, eventually, combined into one index (α = .93).

Autonomy orientation. Orientations towards self-determination were measured with a 9-item control aspirations scale (Frese et al., 2007). Sample items are: „Work is more interesting when you can make a lot of decisions on your own" and „I would rather be told exactly what I have to do. Then I make fewer mistakes" (reversed) (α = .84).

Workplace alienation. A 5-item scale by Penley and Gould (1988), originally labeled alienative organizational commitment, was used to measure workplace alienation in terms of experienced helplessness and negative affect towards the organization. Sample items are: „No matter what I do around here, this organization remains unchanged" and „I get angry when I think about this organization" (α = .73).

Demographic variables. Participants reported their age in years; categorical variables assessed gender (0/1 = male/female) and employment status (0/1 = full-/part-time).

Results

Latent-variable confirmatory factor analysis (CFA) and manifest-variable path modeling were performed with AMOS 18.0 (Byrne, 2001). Full information maximum likelihood estimation accounted for missing data. Applied fit criteria were: Incremental Fit Index (IFI), Tucker-Lewis Index (TLI), and Comparative Fit Index (CFI) of .90 or higher; Root Mean Square Error of Approximation (RMSEA) up to.08; a narrow 90 % Confidence Interval (CI) for the population RMSEA with an upper bound below.10; Hoelter's Critical N (CN), the sample size for which chi-square would *not* be significant (p > .05), of at least 200.

Measurement models are documented in Table 1. A slightly low TLI notwithstanding, the 6-factor work characteristics model (4 items per scale) was acceptable. Discarded were a 1-factor, 2-factor (resources and demands), and 3-factor model (combining scales according to basic needs). A 5-factor model of employee responses comprising 29 manifest indicators (24 items and 5 factor parcels for psychosomatic symptoms) was satisfactory, but not a 1-factor or a 2-factor model (positive and negative responses). Autonomy orientation (9 items) was confirmed as one-dimensional. Except for slightly low values of TLI and CFI, the complete 12-factor structure (57 items and 5 parcels) met standards for acceptable fit. Subsequently, measures were aggregated at the scale level. Descriptive statistics and correlations are provided in Table 2.

Hypotheses were tested in the manifest-variable path model shown in Figure 1. In the baseline model, thirteen paths represented H1a to H4c; ten additional paths assessed possible, yet explicitly not hypothesized results. Effects from all work characteristics were included on *both* first-order responses and from these on *all three* second-order outcomes. Autonomy Orientation was modeled to affect all employee responses. Second-order outcomes were allowed to correlate. Overall, fit indices were acceptable (see Table 1). Confirming H1a, H1b, and H1c, Work Autonomy (β = .10, p < .01), Learning Opportunities (β = .09, p < .05), and Cooperation Requirements (β =.09, p < .01) related positively to Work Motivation, but not to Work Strain (β = .06, β = -.03 and β =.00; all p > .05). Supporting H1d, Work Motivation was positively related to Affective Commitment (β = .37, p < .01), but not to Psychosomatic Symptoms (β = -.03, p > .05). Corresponding with H2a, H2b, and H2c, Work Overload (β = .18, p < .01), Learning Constraints (β = .17, p < .01), and Communication Problems (β = .09, p < .05) were positively associated with Work Strain, but unrelated to Work Motivation (β = .03, β = -.04 and β = -.06; all p > .05). In line with H2d, Work Strain predicted Psychosomatic Symptoms (β = .56, p < .01), but not Affective Commitment (β = -.05, p > .05). Supporting H3a and H3b, Autonomy

Orientation related positively to Work Motivation (β = .10, *p* < .01) and negatively to Work Strain (β = -.12, *p* < .01), but not to Affective Commitment (β =.01, *p* > .05) or Psychosomatic Symptoms (β = -.05, *p* > .05). Negative effects of Work Motivation (β = -.20, *p* < .01) and Autonomy Orientation (β = -.14, *p* < .01) and a positive effect of Work Strain (β = .36, *p* < .01) on Workplace Alienation confirmed H4a, H4b, and H4c.

Three alternative models (Table 1) assessed the effects of a) demographic control variables; b) changing the order of dependent variables; and c) trimming non-hypothesized paths. The controlled model included effects of gender, age, and employment status on all dependent constructs. Six (out of 15) paths were significant. Older workers scored higher on both motivational (Work Motivation: β = .10, *p* < .01; Affective Commitment: β = .18, *p* < .01) and strain-related

measures (Work Strain: β = .11, *p* < .01; Psychosomatic Symptoms: β = .07, *p* < .05; Workplace Alienation: β = .11, *p* < .01). Women reported higher Work Motivation than men (β = .12, *p* < .01). Employment status had no influence. Model fit and structural paths were unaffected by the inclusion of controls. In the reordered model, the sequential order of Work Motivation and Affective Commitment, respectively Work Strain and Psychosomatic Symptoms, was reversed. A decrease in fit indicated superiority of the hypothesized order of proximal and distal responses. In the trimmed model, all non-hypothesized paths were deleted, resulting in a (non-significant) increase in the chi-square discrepancy ($\Delta\chi^2(10) = 14.42$ ns), but, overall, a noticeable improvement in model fit. Significance and effects of retained hypothesized paths remained unchanged.

Table 1: Fit indices for confirmatory factor analyses and path model.

	χ^2	df	IFI	TLI	CFI	RMSEA [CI]	CN
CFA Work Characteristics: Hypothesized 6-factor model	932.08	237	.90	.88	.90	.054 [.050-.058]	296
CFA Work Characteristics: Alternative 1-factor model	3130.33	252	.56	.46	.55	.107 [.103-.110]	94
CFA Work Characteristics: Alternative 2-factor modela	2432.50	251	.66	.59	.66	.093 [.090-.096]	120
CFA Work Characteristics: Alternative 3-factor modelb	2939.46	249	.58	.50	.58	.104 [.100-.107]	99
CFA Employee Responses: Hypothesized 5-factor model	1408.80	364	.92	.90	.92	.053 [.050-.058]	293
CFA Employee Responses: Alternative 1-factor model	5899.60	374	.56	.48	.55	.121 [.118-.124]	72
CFA Employee Responses: Alternative 2-factor modelc	4612.07	373	.66	.60	.66	.106 [.104-.109]	92
CFA Autonomy Orientation: Hypothesized 1-factor model	189.35	27	.94	.90	.94	.077 [.067-.088]	214
CFA All Study Instruments: Hypothesized 12-factor model	4409.43	1760	.90	.88	.89	.039 [.037-.040]	425
Baseline Model: Including non-hypothesized paths	139.03	19	.96	.85	.96	.079 [.067-.092]	219
Controlled Model: Including control variables	141.89	19	.97	.84	.96	.080 [.068-.093]	214
Reordered Model: Reversed order of dependent variables	152.00	19	.96	.83	.95	.083 [.071-.096]	200
Trimmed Model: Deletion of non-hypothesized paths	153.45	29	.96	.90	.96	.065 [.055-.076]	280

Note: N = 1008; χ^2 = chi-square discrepancy (all p < .01); df = degrees of freedom; IFI = Incremental Fit Index; TLI = Tucker Lewis Index; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation; CI = 90 % confidence interval of population RMSEA; CN = Hoelter's Critical N; [a]Factor 1: Task Autonomy, Learning Opportunities and Cooperation Requirements; Factor 2: Work Overload, Learning Constraints, and Cooperation Problems; [b]Factor 1: Task Autonomy and Work Overload; Factor 2: Learning Opportunities and Learning Constraints; Factor 3: Cooperation Requirements and Communication Problems; [c]Factor 1: Work Motivation and Affective Commitment; Factor 2: Work Strain, Psychosomatic Symptoms, and Workplace Alienation.

Table 2: Descriptive statistics and correlations.

	M	SD	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1. Gender	-	-															
2. Age	43.56	8.37	-.31**														
3. Employment status	-	-	.53**	-.12**													
4. Task Autonomy	3.52	0.64	-.16**	.14**	-.15**	(.76)											
5. Learning Opportunities	3.28	0.70	-.10**	.08**	-.09**	.36**	(.73)										
6. Cooperation Requirements	2.63	0.74	.13**	-.06	.11**	-.08*	.24**	(.71)									
7. Work Overload	2.45	0.66	.12**	-.02	.11**	-.31**	-.01	.29**	(.71)								
8. Learning Constraints	2.29	0.64	.13**	.00	.17**	-.30**	-.12**	.19**	.48**	(.70)							
9. Communication Problems	2.29	0.63	.13**	-.13**	.14**	-.36**	-.10**	.22**	.69**	.59**	(.71)						
10. Work Motivation	3.83	0.51	.02	.09**	-.02	.18**	.17**	.08*	-.06	-.12**	-.12**	(.73)					
11. Affective Commitment	3.01	0.70	-.06	.21**	-.06*	.18**	.17**	.05	-.05	-.08**	-.14**	.37**	(.75)				
12. Work Strain	2.37	0.71	-.01	.09**	.01	-.12**	-.06	.10**	.33**	.33**	.33**	.05	-.02	(.89)			
13. Psychosomatic Symptoms	1.84	0.58	.06	.08**	.08**	-.16**	-.06*	.09**	.29**	.32**	.32**	.00	-.02	.56**	(.93)		
14. Autonomy Orientation	4.02	0.51	-.16**	.13**	-.10**	.29**	.18**	-.12**	-.27**	-.33**	-.33**	.15**	.07*	-.24**	-.18**	(.84)	
15. Workplace Alienation	2.26	0.70	-.00	.09**	.00	-.26**	-.11**	.04	.32**	.37**	.39**	-.20**	-.38**	.38**	.33**	-.26**	(.73)

Note: N = 1008; M = mean; SD = standard deviation; gender (0/1 = male/female) and employment status (0/1 = full-/part-time) are dichotomous variables; values in matrix diagonal (in parentheses) are Cronbach's alpha coefficients; **p < .01; *p < .05.

Figure 1: Structural path model of self-determination in employee responses to work.
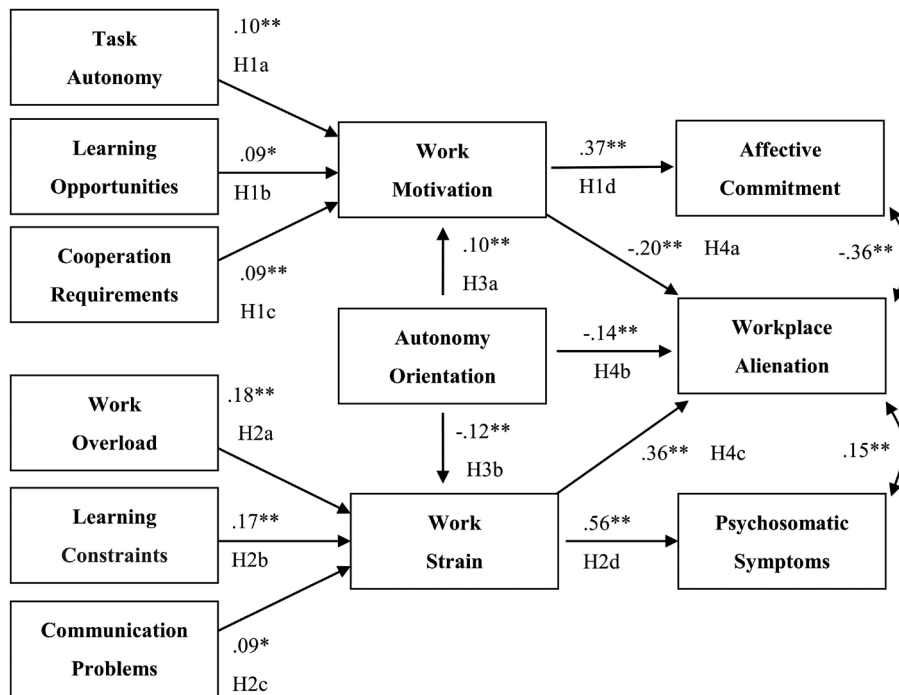
Note: : N = 1008; standardized estimates (β-weights); **p < .01, *p < .05; not displayed are correlations between independent variables and the following non-significant paths:
a) From Task Autonomy (β = .06, p > .05), Learning Opportunities (β = -.03, p > .05), and Cooperation Requirements (β =.00, p > .05) on Work Strain;
b) From Work Overload (β =.03, p > .05), Learning Constraints (β = -.04, p > .05), and Communication Problems (β = -.06, p > .05) on Work Motivation;
c) From Work Motivation (β = -.03, p > .05) on Psychosomatic Symptoms;
d) From Work Strain (β = -.05, p > .05) on Organi- za   tional Commitment;
e) From Autonomy Orientation on Organizational Commitment (β =.01, p > .05) and Psychosomatic Symptoms (β = -.05, p > .05).

Discussion

General Discussion

This study contributes to work design research by integrating core assumptions of the JDRM and SDT. Work motivation and work strain were confirmed as relatively independent or „dual" processes, triggered by different types of work characteristics (Bakker & Demerouti, 2007). Another purpose was to demonstrate the utility of SDT to inform established models in organizational research (Gagné & Deci, 2005). Work characteristics of task autonomy, learning opportunities, and cooperation requirements were chosen as job resources, based on SDT's postulate that autonomous motivation stems from satisfaction of psychological needs for autonomy, competence, and relatedness (Baard et al., 2004). Work overload, learning constraints, and cooperation problems were selected as work stressors, based on the constraints they impose on the fulfillment of basic needs. Supporting both JDRM and SDT, there

was a clear differential pattern in the associations of work characteristics with motivation and strain. According to theory, resources and demands trigger a motivational, respectively health-impairment process. Studies on the JDRM rarely reflect this – typically focusing on work engagement and burnout, but not considering the complex inner dynamics of these multi-dimensional constructs (Schaufeli & Bakker, 2004). Drawing on an alternative set of proximal and distal employee responses, dual processes of work motivation and health-impairment were explicitly modeled in this study. Accordingly, job resources evoke work motivation, which, via processes of „organismic integration", fosters affective commitment, that is, identification with the organization and internalization of its goals (Gagné et al., 2008). Stressful job demands (job stressors) were related to medium-term psychological irritation, which can progress to more severe psychosomatic symptoms in the longer-term (Frese, 1985). Additionally, results suggest that certain psychological states may manifest at the intersection of the mo-

tivational and health-impairment process. Workplace alienation, as an amotivated and aversive state of experienced powerlessness and negative affect towards the organization, was established as a consequence of low intrinsic motivation and high psychological strain (Banai & Reisel, 2008). Lastly, the model supported the relevance of individual orientations towards control (Lam & Gurland, 2008). Framed as employee aspirations to exercise control and work in a self-determined way, autonomy orientation reinforced work motivation and reduced the risk of work strain and alienation (Frese et al., 2007). Intrinsic work motivation and autonomy orientation were measured with established scales, corresponding with concepts of SDT. The convergent validity with the measures used in SDT research, however, was not tested.

Methodological Limitations

Study results may be viewed as „tainted" by the methodological limitations of cross-sectional self-report studies. Expert opinions on common method bias, however, are inconclusive, ranging from „severe flaw" to „urban myth" (Spector, 2006). Presented results provide a snapshot, but dynamics need to be studied with longitudinal designs. Small effect sizes may be explained by range restrictions in a sample of employees doing similar jobs in the same organization (de Jonge & Schaufeli, 1998). Some heterogeneity in work arrangements (e.g., job duties, work locations, working hours), however, introduced a desirable source of variance (Hornung et al., 2008). Therefore, control variables were included only sparingly. This study used a non-representative convenience sample, which is common practice, but threatens external validity. Yet, there was no reason to suspect that results were context-specific. In some cases, fit indices were lower than desirable, but this was a minor issue, attributable partly to the number of included items and structural paths. Manifest-variable path analysis was used as it permits testing more complex models relative to sample size. Alternative model testing did not call initial findings into question.

Theoretical Implications

Job resources and demands (or stressors) were framed as supportive and hindering conditions for need satisfaction. Arguably, need fulfillment (e.g., competence) may also be based on overcoming obstacles and mastering demands (Hornung, Rousseau, Glaser, Angerer & Weigl, 2010). The dichotomy of resources and demands may be overly simplistic and the suggested tripartite taxonomy of work-related resources, learn-

ing demands, and job stressors might be more accurate (Glaser et al., 2015). This theory-based taxonomy corresponds with meta-analytic results, distinguishing between resources, challenge demands, and hindrance demands. Currently, it is not clear, if the duality of JDRM can be reconciled with a tripartite taxonomy of work characteristics. To integrate core assumptions of the JDRM and SDT, this study adopted the two-dimensional distinction of demands and resources from the JDRM, along with the three-dimensional taxonomy of basic psychological needs from SDT. Selecting work characteristics according to whether they support or hinder the fulfillment of psychological needs for autonomy, competence, and relatedness has proven useful in this context, but is not without problems. A case in point is cooperation requirements. A construct similar to task interdependence, the need for task-related cooperation was included to represent opportunities for the satisfaction of social needs and its positive motivational role was confirmed (Kiggundu, 1981). Conceptualized as a requirement, rather than an opportunity, need for collaboration arguably reflects more of a „positive demand" than a genuine resource (Hacker, 2003; Hornung et al., 2010). A (small) negative correlation with autonomy and a (larger) positive association with learning opportunities illustrates this ambiguity. Trade-offs between interdependence and autonomy, however, are intuitive and established (Humphrey et al., 2007). This study tolerated this tension, as work characteristics were analyzed at the scale level and not aggregated into higher-order factors.

Practical Implications

The assembled model has practical implications for managing worker well-being and performance. The primary measure to lessen job strain and prevent its progression to more severe psychosomatic health problems is the reduction of work stressors. To promote intrinsic motivation and psychological internalization of organizational goals, work characteristics that provide opportunities to experience autonomy, competence and relatedness appear to be crucial levers. The costs of poorly designed jobs become evident in employees who are disengaged from their work and alienated from the organization.

Employees respond fairly consistently to work characteristics. Yet, due to individual differences, generic work redesign may not yield optimal results. Self-determined employees appear to profit more from opportunities for need satisfaction and are less vulnerable to stressors, possibly by taking own actions to make their work more supportive of their well-being (Hornung et al., 2010). Employees with external control beliefs may need especially supportive conditions

to maintain well-being and stay engaged in their work. Control orientations are subject to change in longer-term processes of occupational socialization. Specifically, proactive attitudes and behavior can be developed through the provision of autonomy and challenging work (Frese et al., 2007; Hacker, 2003). Accounting for individual differences and intrapersonal developments, a promising approach with particular relevance to workforce learning, is to combine broad-based work design interventions with differential and dynamic elements to allow person-specific adjustments.

Conclusion

Combining JDRM and SDT provides a useful framework to organize positive and negative, short- and longer-term, attitudinal, behavioral, and health-related work outcomes. Understanding of the associated psychological processes is vital for the design of effective workplace health and performance management programs. The presented integration was limited to core assumptions of the JDRM and SDT while neglecting other elements, such as interactions of demands and resources in the JDRM or the role of managerial autonomy support in SDT. Presented results thus are preliminary rather than comprehensive and, hopefully, may serve as a basis for future research to build on.

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