Day-specific variance of self-control demands moderating the day-specific relations between mean levels of self-control demands and well-being

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Abstract: In a study with 67 employees from different occupational fields over 10 days we examined the interactive effects of day-specific mean levels and variance of impulse control demands on ego depletion and subjective vitality as indicators of well-being. Drawing on the limited strength model of self-control, which suggests that self-control demands draw on and deplete a limited regulatory resource that is suggested to recover when individuals refrain from exerting self-control, we argue that day-specific mean levels of work-related demands on impulse control deplete the limited regulatory resource and manifest in day-specific indicators of impaired well-being. Moreover, we argue that a high day-specific variance represents strong day-specific fluctuations of self-control demands during which employees have the opportunity to recover regulatory resources. Consequently, we propose that a high day-specific variance moderates (buffers) the adverse effects of mean levels of self-control demands. The results of multi-level analyses support the proposed main and moderating effects. Afterwards theoretical and practical implications are discussed.

Keywords: Self-control demands, ego depletion, well-being, multi-level analysis

1. Introduction

In the last decades, the world of work has undergone tremendous changes. Particularly in industrialized countries there has been a shift from production-oriented work with foremost physical work-demands, to service-oriented and technologically challenging work with a tremendous increase of knowledge-based occupations. In such work environments employees are required to be flexible, responsive service providers who can effectively anticipate and fulfil changing customers' needs and be adaptive, creative and innovative in applying new technologies (Pongratz 2004). In turn, such highly dynamic work-environments demand employees' adaptability and flexibility. However, such demands cannot be met by automated and rigid patterns of behavior. Rather, they call for considerable self-control at work, which can be defined as the ability to override or inhibit automatic, habitual, or spontaneous action tendencies, urges, emotions, or desires that would otherwise interfere with purposeful, goal-directed behavior (Baumeister et al. 2007).

Even though, self-control has been demonstrated to predict several beneficial outcomes in different life domains (e.g., academic success and less substance abuse; Baumeister & Vohs 2004), there is also evidence on the psychological costs of self-control. A series of experimental studies demonstrated that self-control

performance on a task was consistently impaired when individuals previously exerted self-control (Baumeister et al. 1998). Drawing on the evidence that exerting self-control can reduce performance in subsequent self-control related tasks, Muraven and Baumeister (2000) delineated the strength model of self-control. This model suggests that exerting self-control even on different tasks relies on a common limited regulatory resource capacity (will-power) and that overtaxing the capacity of this limited regulatory resource (e.g., due to recurrent exertion of self-control) leads to a state of regulatory resource depletion. Moreover, the authors suggest that the regulatory resource does not stay depleted forever and thus can be restored by refraining from exerting self-control. However, the inability to restore the regulatory resource and potential continuous states of ego depletion can manifest in self-regulatory failures and chronical impairments of the ability to exert self-control.

Drawing on this model, Neubach and Schmidt (2006) developed and validated a scale to measure self-control demands (SCDs) at work. This scale consists of three different forms of work-related SCDs. Demands on impulse control reflect the necessity to supress and control spontaneous or habitual reaction tendencies and associated emotions at work. Resisting distractions describe the necessity to ignore task-irrelevant stimuli, which can interfere with the task at hand. Overcoming inner resistances describe the extent to which unattractive work-related tasks require individuals to exert self-control to overcome motivational barriers.

The application of this scale has led to several longitudinal and cross-sectional studies examining work-related SCDs and their effect on employees' performance and well-being outcomes. Drawing on the limited strength model of self-control these studies hypothesized that work-related SCDs draw on and deplete a limited regulatory resource and that depletion of this resource impairs well-being. The results provided convincing evidence on the adverse effects of work-related SCDs on subjective and objective indicators of employees' well-being (see Schmidt & Diestel 2015 for an overview). Additionally, more recent research has suggested that SCDs are not only subject to interindividual fluctuations, but may also fluctuate intraindividually (from day to day). For example, on some days with more frequent interactions with others (cf., colleagues, supervisors, customers) at work SCDs are expected to be higher compared to days with less contact to others. In turn, this research has indeed demonstrated that SCDs also fluctuate from day to day and that high day-specific SCDs predict impairments in employees' day-specific psychological well-being (e.g., Rivkin et al. 2015).

Even though previous research has provided convincing evidence for the argument that SCDs draw on and deplete a common limited regulatory resource by demonstrating direct adverse effects of SCDs on indicators of well-being, there is a lack of evidence on the proposition that the limited regulatory resource recovers when individuals do not exert self-control. To investigate this proposition in the present study we examine the effects of the day-specific variability of self-control demands. While a low variability indicates that SCDs are relatively constant across a day, a high variability suggests that on a specific day individuals have to cope with varying peaks high and low SCDs. In turn, we propose that a high variability offers employees opportunities to recover their regulatory resources when SCDs are low.

In sum, drawing on the limited strength model of self-control we argue that high mean levels of SCDs are negatively related to day-specific indicators of well-being (ego depletion and subjective vitality). However, in contrast to a low day-specific variability of SCDs, a high variability gives individuals the opportunity to recover their regulatory resource. Thus, we argue that day-specific variance of SCDs moderates

(buffers) the day-specific negative relations between mean levels of SCDs on indicators of well-being.

2. Methode

To test our hypotheses, we conducted a diary study with employees from various occupational fields. Overall, 67 participants were included in our study. In advance of the day-specific measurements, the participants responded to a general questionnaire that assessed biographical variables. Over ten consecutive workdays, four times per day (one hour after the beginning of work, at midday, one hour before the end of work, and one hour after the end of work; 489 daily measurements), participants received emails in order to answer day-specific questionnaires. At every time point during their work day, participants rated their SCDs in the last hour. In the evening after work, ego-depletion and subjective vitality was assessed. Because of their unique effect on indicators of well-being, in the present study we focused on impulse control demands as a dominant form of SCDs.

The measurement of day-specific impulse control demands was based on four items from the previously described SCDs scale by Neubach and Schmidt (2007). The participants rated the degree to which they had to control their impulses in “the last hour” of their work. Afterwards, we computed the day-specific mean level of impulse control demands by calculating the mean of all items across the three measurement points during the work day. The same procedure was used to compute the day-specific variance.

We assessed day-specific ego-depletion using five items related to the participant’s current experiences with resource depletion. The scale was developed and validated by Bertrams et al. (2011).

Subjective vitality was assessed with four items from Ryan and Frederick’s (1997) subjective vitality scale. The scale was conceptualized to measure the feeling of being alive and alert.

3. Results

We used stepwise multi-level with the MLwiN program (Rasbash et al. 2014). The null model only included the intercept. When the parameters were included in MLwiN, mean levels and variance of impulse control demands were centered around the person mean (group-mean centering; Enders & Tofighi 2007). We examined our moderator hypothesis by testing interactions of the mean levels of impulse control demands with the variance of impulse control demands (level 1) on ego-depletion and subjective vitality (level 1).

Results are depicted in Table 1. Consistent with our proposition, the multi-level estimates indicate that after controlling for demographic variables, mean levels of impulse control demands are positively related to ego-depletion ($\gamma = 0.25$, $p < .05$) and negatively related to subjective vitality ($\gamma = -0.40$, $p < .01$).

Moreover, we proposed that variance of impulse control demands moderates the day specific relationship between mean levels of self-control demands and ego-depletion as well as subjective vitality. Our results reveal a weakly significant effect of the interaction between mean levels and variance of impulse control demands on ego depletion and a significant interaction effect on subjective vitality. To facilitate the interpretation of the interaction effect, we depicted the interaction effects. As shown

in Figure 1, a high day-specific variance attenuates the adverse effects of mean levels of impulse control demands on ego depletion and subjective vitality.

4. Discussion

The present results provide convincing evidence for our propositions a) that day-specific mean levels of impulse control demands are negatively related to employees' day-specific of well-being and b) that day-specific variance of impulse control demands buffers these adverse effects.

Table 1: *Multilevel estimates for predicting ego-depletion and subjective vitality*

	Ego-Depletion - Midday							
	Null model		Model 1		Model 2		Model 3	
Parameter	γ	SE	γ	SE	γ	SE	γ	SE
Fixed effects								
γ_{00}= Intercept	2.04**	0.60	3,02**	0.68	2,71**	0.67	2,80**	0.66
γ_{01}= Age			-0.01	0.01	-0.01	0.01	-0.01	0.01
γ_{02}= Gender			-0.36*	0.18	-0.40*	0.17	-0.41*	0.17
γ_{02}= Leadership			-0.32	0.20	-0.22	0.20	-0.24	0.20
γ_{02}= *T*ime			0.25	0.23	0.29	0.22	0.30	0.22
γ_{03}= *M*ean ICDs (MICDs)					0.25*	0.07	0.25*	0.07
γ_{04}= Variance ICDs (VICDs)					-0.01	0.06	0.05	0.08
γ_{05}= MICDs x VICDs							-0.24+	0.13
Random effects								
Level 1 intercept variance	0.36		0.35		0.33		0.27	
Level 2 intercept variance	0.32		0.32		0.29		0.24	
- 2*log (lh)	983.6		988.9		968.4		966.5	
Δ - 2*log (lh)			0.0		20.5**		1.9+	
df			3		2		1	

	Subjective Vitality							
	Null model		Model 1		Model 2		Model 3	
Parameter	γ	SE	γ	SE	γ	SE	γ	SE
Fixed effects								
γ_{00}= Intercept	4.09**	0.14	3,17*	1,19	2,62*	1,15	2,53*	1,10
γ_{01}= Age			0.01	0.01	0.01	0.01	0.01	0.01
γ_{02}= Gender			0.41	0.31	0.33	0.30	0.43	0.29
γ_{02}= Leadership			0.29	0.35	0.42	0.34	0.41	0.33
γ_{02}= *T*ime			-0.28	0.40	-0.07	0.38	-0.16	0.37
γ_{03}= *M*ean ICDs (MICDs)					-0.40**	0.11	-0.39**	0.12
γ_{04}= Variance ICDs (VICDs)					0.01	0.11	-0.14	0.15
γ_{05}= MICDs x VICDs							0.61*	0.25
Random effects								
Level 1 intercept variance	1.04		1.04		1.04		0.96	
Level 2 intercept variance	0.97		0.97		0.89		0.86	
- 2*log (lh)	1521.7		1527.4		1507.1		1500.1	
Δ - 2*log (lh)			0.0		20.3**		7.0**	
df			3		2		1	

Note: Gender, age, Leadership position, and time are person-level (Level 2) variables; Impulse control demands (ICDs) is a day-level (Level 1) variable. $^{+}$ *p < .10* * *p < .05* ** *p < .01.*

These results offer two theoretical contributions to the limited strength model of self-control. First, the direct adverse effects of mean levels of self-control support the proposition that acts of self-control draw on and deplete a limited regulatory resource and that depletion of this resource manifests in impairments of employees' well-being. Second, the moderating effects of day-specific variance strongly suggest that employees may recover their regulatory resource during periods which do not necessitate the exertion of self-control.

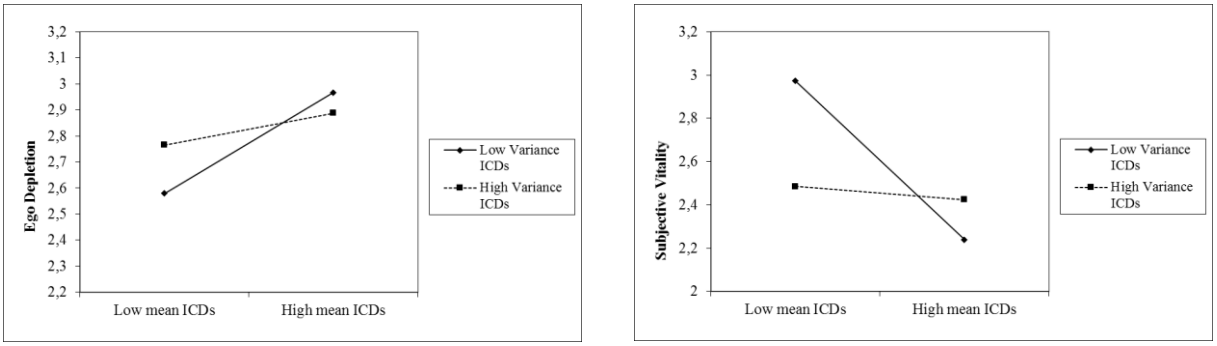

***Figure 1**: Interaction effect of mean levels and variance of impulse control demands on ego-depletion and subjective vitality.*

From a practical perspective, our results suggest that to prevent the adverse effects of SCDs employees should structure work-related SCDs in a way that ensures a high variability and associated periods of rest.

5. References

Baumeister RF, Bratslavsky E, Muraven M, Tice DM (1998) Ego depletion: Is the active self a limited resource? Journal of Personality and Social Psychology 74:1252-1265.

Baumeister RF, Vohs KD (Eds.) (2004) Handbook of self-regulation. Research, theory, and applications. New York: Guilford Press.

Baumeister RF, Vohs KD, Tice DM (2007) The strength model of self-control. Current Directions in Psychological Science 16:351-355.

Bertrams A, Unger A, Dickhäuser O (2011) Momentan verfügbare Selbstkontrollkraft – Vorstellung eines Messinstruments und erste Befunde aus pädagogisch-psychologischen Kontexten. Zeitschrift für Pädagogische Psychologie 25:185-196.

Enders CK, Tofighi D (2007) Centering predictor variables in cross-sectional multilevel models: A new look at an old issue. Psychological Methods 12:121–138.

Muraven M, Baumeister RF (2000) Self-regulation and depletion of limited resources: Does self-control resemble a muscle? Psychological Bulletin 126: 247-259.

Neubach B, Schmidt K-H (2006) Selbstkontrolle als Arbeitsanforderung – Rekonzeptualisierung und Validierung eines Messinstruments [Self-control as a job demand – development and validation of a measurement instrument]. Zeitschrift für Arbeits- und Organisationspsychologie 50:103-109.

Neubach B, Schmidt K-H (2007) Entwicklung und Validierung von Skalen zur Erfassung verschiedener Selbstkontrollanforderungen bei der Arbeit [Development and validation of scales for measuring different self-control demands at work]. Zeitschrift für Arbeitswissenschaft 61:35-45.

Pongratz HJ (2004) Der Typus "Arbeitskraftunternehmer" und sein Reflexionsbedarf. In: Buer F., Siller G. (Hrsg) Die flexible Supervision. Herausforderungen – Konzepte – Perspektiven. Eine kritische Bestandsaufnahme (pp 17–34) [Flexible supervision. Challenges – Concepts – Perspectives. A critical review]. Wiesbaden: VS-Verlag.

Rasbash JR, Charlton C, Jones K, Pillinger R (2014) Manual supplement for MLwiN Version 2.31. Centre for Multilevel Modelling: University of Bristol.

Rivkin W, Diestel S, Schmidt K-H (2015) Psychological detachment: a moderator in the relationship of self-control demands and job strain. European Journal of Work and Organizational Psychology 24:376-388.

Ryan RM, Frederick C (1997) On energy, personality, and health: Subjective vitality as a dynamic reflection of well-being. Journal of Personality 65:529-565.

Schmidt K-H, Diestel S (2015) Self-control demands: From basic research to job-related applications. Journal of Personnel Psychology 14:49-60.