



# When Do Those High in Trait Self-Control Suffer From Strain?

## The Interplay of Trait Self-Control and Multiple Stressors

Kai Externbrink<sup>1</sup> , Stefan Diestel<sup>2</sup>, and Martina Krings<sup>1</sup>

<sup>1</sup>Department of Business and Psychology, FOM University of Applied Sciences, Dortmund, Germany

<sup>2</sup>International School of Management, Dortmund, and University of Wuppertal, Germany

**Abstract:** We explore the limits of the protective function of trait self-control in coping with sources of stress. Inspired by integrative self-control theory (ISCT) we predict that trait self-control only buffers the relationship between self-control demands and irritation when individuals have to cope with one source of stress, whereas in cases of two stressors, trait self-control fails to attenuate adverse effects. Samples consisted of occupational students ( $N = 163$ ) and partly or fully or not formally employed students ( $N = 135$ ). Job-related self-control demands (SCDs) did not predict strain when trait self-control was high and the other stressor (academic SCDs or weekly study time) was low, whereas strain was disproportionately higher and predicted by SCDs when trait self-control was low or the other stressor was high.

**Keywords:** academic and job-related self-control demands, study and working time per week, trait self-control, irritation

Trait self-control reflects interindividual differences in the ability to override spontaneous impulses, motivational blockades, and habitual response patterns (Tangney, Baumeister, & Boone, 2004). Growing evidence demonstrates trait self-control is a promising precursor for self-regulatory functioning in nearly all life domains (de Ridder, Lensvelt-Mulders, Finkenauer, Stok, & Baumeister, 2012). Not only academic and job performance are predicted by trait self-control (Stumm, Thomas, & Dormann, 2010; Zettler, 2011), but also stable interpersonal relationships, psychological health, and higher self-acceptance (Shoda, Mischel, & Peake, 1990; Vohs & Faber, 2007). Finally, and more relevant for personnel psychology, supervisors' trait self-control buffers deleterious effects of dysfunctional emotional regulation on their resulting tendency to abusive supervision (Yam, Fehr, Keng-Highberger, Klotz, & Reynolds, 2016). Conversely, in cases of high abusive supervision, followers with high trait self-control show less supervisor-directed aggression as compared to followers with low trait self-control (Lian et al., 2014). Inspired by such and similar findings, Schmidt, Hupke, and Diestel (2012) have identified trait self-control as a protective resource, which prevents high psychological strain, especially when demands are high.

Although trait self-control seems highly important for employees' psychological health, recent theoretical models suggest boundary conditions under which trait self-control may not stabilize well-being and even those with high trait

self-control experience disproportionately high strain in response to high demands. In particular, integrative self-control theory (ISCT; Kotabe & Hofmann, 2015; Lian, Yam, Ferris, & Brown, 2017) proposes a trait component in the capacity to exert volitional self-control and implies that simultaneously occurring demands that exceed the capacity may result in disproportionately high strain, even when the trait component is well developed (i.e., trait self-control is high). In other words, trait self-control will protect individuals from high strain, if and only if they have to cope with one demand.

We believe the limits of trait self-control become notably manifest for those who are faced with multiple sources of stress in different domains putting high demands on self-control, and thus taxing the control capacity (e.g., Diestel & Schmidt, 2011). A prototypical example is occupational students who have to cope with stressors in two domains, the academic and the job-related setting. While occupational study programs address skills shortages in organizations and enable employees to gain extra qualifications without restricting professional activity, integrating study and work into weekly schedules can be stressful and can result in psychological strain, because lectures are held in the evenings after a working day and at weekends. Therefore, based on two samples with students who were either fully or partially employed, we examine the moderating role of trait self-control under conditions of two sources of stress. We thereby focus on self-control demands (SCDs),

especially overcoming inner resistance (the requirement to override motivational deficits to complete unattractive tasks that cannot be postponed or evaded; Schmidt & Diestel, 2015), because past research has repeatedly revealed that such SCDs are strongly positively related with indicators of psychological strain, such as burnout symptoms, impaired work engagement, and absenteeism. In conclusion, we predict a three-way interaction of trait self-control and job-related and academic SCDs on strain: Trait self-control attenuates the positive relation of one stressor to psychological strain, if and only if the other stressor is low, whereas trait self-control does not prevent strain in cases of coping with both stressors simultaneously.

We thereby contribute to the literature in the following ways: firstly, we apply experimental findings on academic SCDs (Oaten & Cheng, 2005) to a sample of occupational students for whom self-control is highly relevant. Secondly, and theoretically more important, the three-way interaction of trait self-control and both stressors may reveal psychological contingencies under which trait self-control does not buffer the deleterious effects of demands on strain and fails to provide protective resilience in coping with (disproportionately) high stress.

## **Volitional Self-Control in the Academic and Occupational Context**

In increasingly complex and dynamic working environments (Sonnetag & Frese, 2013), employees have to cope with regulatory demands, such as emotional labor (Hülshesger & Schewe, 2011), time pressure (Prem, Paškvan, Kubicek, & Korunka, 2018), problem-solving (Schmitt, Zacher, & Frese, 2012) and SCDs (Schmidt & Diestel, 2015) which cause them to engage in self-control (Prem, Kubicek, Diestel, & Korunka, 2016). In addition, Prem et al. (2016) demonstrated that exercising self-control mediates the relation of such regulatory demands to strain.

In addition to these and similar findings, basic research provides more nuanced insights into how exercising self-control (e.g., overcoming motivational blockades, attentional control, or impulse regulation tasks) causes impairments in executive functioning, lower self-control performance, and exhaustion (Dang, 2018; Hagger, Wood, Stiff, & Chatzisarantis, 2010). To explain the so-called ego-depletion effect (Muraven & Baumeister, 2000), Kotabe and Hofmann (2015) delineated the ISCT, which distinguishes between three phases of the self-control process (activation, exertion, and enactment). A desire-goal conflict, which may result from unattractive, but important tasks and is experienced as an inner motivational blockade, activates the intention to exert self-control to overcome

inner resistances. The exertion of self-control depends on a limited, depletable, but restorable control capacity (Kotabe & Hofmann, 2015, p. 626), which was originally proposed by Muraven and Baumeister (2000) and involves some kind of energetic resource for “will-power.” If high desire-goal conflicts (SCDs) exceed or deplete the capacity, behavioral enactment of self-control will fail and individuals will experience increasing strain. Although the idea of a limited “resource” capacity inspired a controversial debate about its existence and several meta-analytical replication studies (Carter, Kofler, Forster, & McCullough, 2015; Dang, 2018), the mechanistic framework of ISCT and other models of executive functioning (Miyake et al., 2000) provide a well-developed basis for predictions of self-control failures and psychological strain at work (Lian et al., 2017). Additionally, behavioral enactment of self-control may also be impaired by external constraints, like additional sources of stress, which prevent the control capacity from restoring, and thus disproportionately increase the risk of self-control failures and associated strain symptoms. Supporting this view, Diestel and Schmidt (2011) found that job-related SCDs and emotional dissonance mutually amplify each other in their deleterious effects on strain.

However, not only the occupational setting, but also the academic context can put high demands on volitional self-control and thus cause psychological strain. In their longitudinal studies at universities, Oaten and Cheng (2005, 2006) repeatedly reported increasing indicators of strain, such as emotional distress and psychosomatic symptoms, and self-control failures during academic examination periods as compared to students not facing examination stress. In line with ISCT, such findings indicate that time pressure, learning- and problem-solving demands, as well as academic examinations, are aversive and thus tax students’ control capacity. Academic tasks may in general require high self-control, because lectures are often complicated, schedules are usually fixed not allowing for flexible planning and decision making, and academic projects are increasingly complex (e.g., Thomas & Mengel, 2008). Consistent with this argument, burnout and other indicators of psychological strain among students have been repeatedly reported (Stoeber, Childs, Hayward, & Feast, 2011). In sum, employees as well as students are faced with SCDs and are likely to experience high strain as a result of coping with such sources of stress. However, given that many employees are enrolled in academic programs and students increasingly have to work parallel to their studies (in order to self-finance or to gain occupational experience), a growing number of individuals may have to cope with multiple stressors in academic and occupational settings with consequences for their psychological health and well-being.

## The Interplay of Trait Self-Control, Job-Related SCDs, and Academic SCDs

In both academic and job-related settings, trait self-control has emerged as a strong predictor of performance and well-being (de Ridder et al., 2012; Tangney et al., 2004). Moreover, Schmidt et al. (2012) found that trait self-control attenuated the positive relationship between job-related SCDs and psychological strain (see also, Yam et al., 2016).

Despite this promising protective function of trait self-control in coping with sources of stress, ISCT suggests that strain disproportionately increases in cases of simultaneous coping with at least two SCDs, even for those who exhibit high levels of trait self-control. In particular, the trait component of the control capacity reflects interindividual differences in the general ability to volitionally regulate behavior and assures effective regulatory functioning under conditions of goal-desire conflicts (high SCDs) by conserving and efficiently investing the limited resources in control efforts. In support of this argument, Diestel, Rivkin, and Schmidt (2015) found that both trait self-control and sleep quality attenuated the positive relations of emotional dissonance to strain. According to their explanation, trait self-control seems to stabilize well-being through the effective allocation of resources as provided by sleep quality (see also, Beedie & Lane, 2012). However, trait-driven regulatory functioning should only enable successful coping with SCDs, and thus prevent strain, if the overall control capacity was not already depleted and/or enactment constraints, such as other stressors, did not impede restoration of the capacity. In other words, even when trait self-control is high, simultaneous occurring demands, which draw on the same control capacity, should result in high strain, because successful coping with one stressor is constrained by the other stressor. In conclusion, high trait self-control should attenuate positive relations of one stressor to strain, when the other stressor is low, whereas in cases of two stressors, strain should increase, regardless of the level of trait self-control.

*Hypothesis 1:* Trait self-control and academic and job-related SCDs interact in predicting psychological strain: The relationship of one stressor to strain is weakest when the other stressor is low and trait self-control is high. In comparison, in all other cases (the other stressor is high and/or trait self-control is low), SCDs are stronger and positively related to strain.

## Study 1

### Method

We conducted a cross-sectional survey among occupational students of a German university of applied sciences. Participants were recruited via mailings and during lectures. The sample consisted of 163 participants studying for a bachelor degree parallel to a full-time job, of which 65.03% were female. Age was assessed in categories: 60.47% were between 18 and 25 years, 33.13% between 26 and 33 years, and 6.13% were older than 34.

### Irritation

As an indicator of psychological strain, we assessed irritation using the Irritation Scale which was developed by Mohr, Rigotti, and Mueller (2005). The scale involves several perceived emotional and cognitive strain symptoms, such as rumination, difficulties to detach, feelings of anger and impulsivity (eight items, e.g., “I anger quickly”). We focused on irritation because those symptoms reflect failures in self-control (anger and deficits in impulse regulation) and are conceptually related to a wide range of other strain variables (such as distress, depressive symptoms, and daytime dysfunction), which are predicted by demands on self-control (Oaten & Cheng, 2005; Schmidt et al., 2012). All items were scored on a 7-point Likert scale (1 = *strongly disagree*, 7 = *strongly agree*).

### Trait Self-Control

Dispositional self-control was measured with the Self-Control Scale by Bertrams and Dickhäuser (2009; 13 items, e.g., “I am good at resisting temptation”). Items were rated on a 5-point scale (1 = *not at all like me*, 5 = *very much like me*).

### Job-Related and Academic SCDs

We used five items to measure job-related demands on overcoming inner resistances (e.g., “Some of my work tasks are such that I really need to force myself to get them done”; Schmidt & Diestel, 2015). To assess academic SCDs, we adapted the content of the five items to the academic context by changing the word “work” to “academic” (e.g., “Some of my academic tasks are such that I really need to force myself to get them done”). Prior research showed that students are well able to discriminate different forms of SCDs across time and content domains (Oaten & Cheng, 2005). All items were scored on a 5-point rating scale (1 = *not at all*, 5 = *a great deal*). Confirmatory factor analyses (CFAs) provide support for the discriminative validity of both sources of SCDs [2-factor model:  $\chi^2(34) = 60.13$ ,  $p < .01$ , RMSEA = .069, CFI = .959, SRMR = .047; 1-factor

**Table 1.** Descriptive results,  $\alpha$  reliabilities, and intercorrelations (Study 1)

	<i>M</i>	<i>SD</i>	$\alpha$	1.	2.	3.	4.	5.
1. Irritation	3.45	0.97	.77					
2. Gender	1.65	0.48	–	.09				
3. Age	2.50	1.23	–	.14*	.06			
4. Job-related self-control demands	2.67	0.80	.84	.44**	–.05	–.14*		
5. Academic self-control demands	3.04	0.84	.89	.41**	–.09	–.04	.55**	
6. Trait self-control	3.10	0.51	.75	–.33**	.07	.10	–.56**	–.60**

Note. Gender: 1 = male, 2 = female; age: 1 = 18–21 years, 2 = 22–25 years, 3 = 26–29 years, 4 = 30–33 years, 5 = 34–36 years, 6 = 36+ years. \* $p < .05$ , \*\* $p < .01$ .

model:  $\chi^2(35) = 174.62$ ,  $p < .01$ , RMSEA = .156, CFI = .782, SRMR = .095].

## Results

We tested the proposed interactions using moderated regression analyses, which were performed with the process module by Hayes (2013). To avoid multicollinearity, we mean-centered all predictors before forming the product terms (Cohen, Cohen, West, & Aiken, 2003). In the first step, we introduced age and gender as potential covariates as well as the three predictors (job-related and academic demands on overcoming inner resistances, trait self-control). In the second step, all three two-way interactions were included into the equations. Finally, in the third step, the proposed three-way interaction was analyzed to test Hypothesis 1.

Table 1 shows means, standard deviations, intercorrelations, and reliabilities of all study variables. Table 2 provides results of regressions. After controlling for age and gender, job-related and academic SCDs exhibited significant positive relations to irritation, whereas trait self-control did not predict irritation. Finally, and consistent with Hypothesis 1, regression analysis revealed a significant three-way interaction of trait self-control and both SCDs on irritation ( $\Delta R^2 = 0.02$ ;  $p < .05$ ).

We conducted simple slope analysis and depicted the form of interaction (see Figure 1). Specifically, the interaction of academic and job-related SCDs was more pronounced when trait self-control was high. That is, in cases of high trait self-control, the relation of one stressor to irritation was insignificant, when the other stressor was also low, whereas the positive relationship was stronger in the presence of the other stressor. In contrast, in cases of low trait self-control, the positive relations of one stressor to irritation were positive and significant regardless of the level of the other stressor.

## Discussion of Study 1 and Hypotheses Development for Study 2

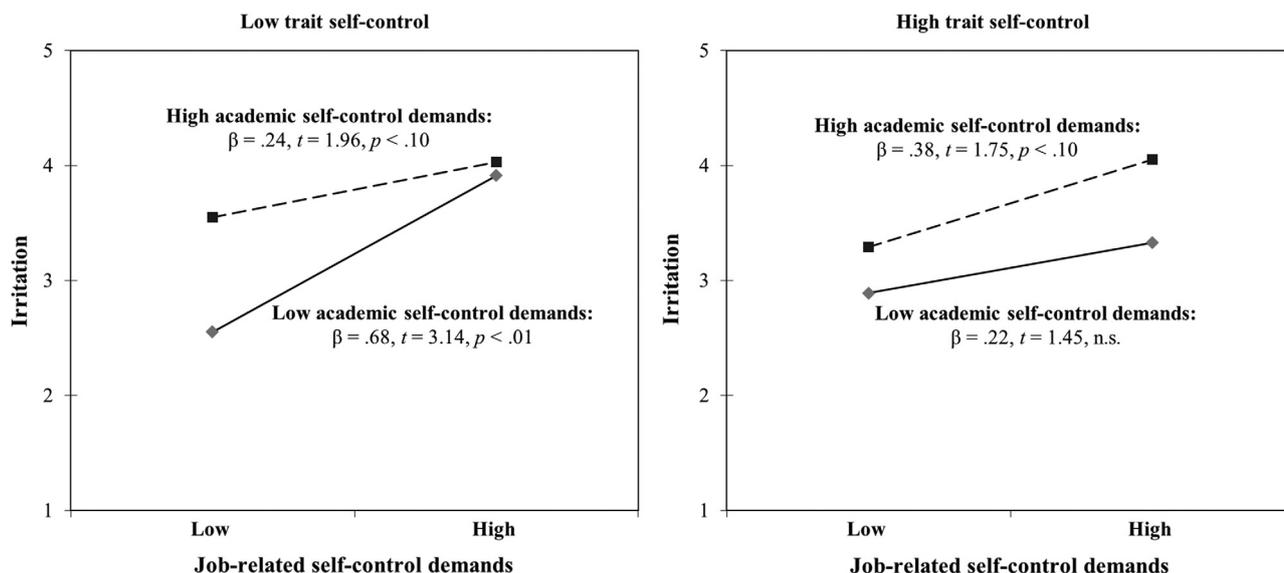
According to our findings in Study 1, trait self-control will moderate the positive relationship between one source of

**Table 2.** Results of multiple regression analysis for predicting irritation (Study 1)

Model	$\beta$	<i>t</i>
Step 1 – Predictors		
Gender	.05	0.71
Age	–.09	–1.26
Job-related self-control demands	.28	3.19**
Academic self-control demands	.23	2.52*
Trait self-control	–.02	–0.21
$R^2$	.24	
<i>F</i>	10.09**	
Step 2 – Two-way interaction		
Job-Related Self-Control Demands × Academic Self-Control Demands	–.10	–0.95
Job-related Self-Control Demands × Trait Self-Control	–.08	–0.71
Academic Self-Control Demands × Trait Self-Control	.02	0.17
$\Delta R^2$	.01	
$\Delta F$	0.37	
Step 3 – Three-way interaction		
Job-Related Self-Control Demands × Academic Self-Control Demands × Trait Self-Control	.23	2.16*
$\Delta R^2$	.02	
$\Delta F$	4.67*	

Note. Gender: 1 = male, 2 = female; age: 1 = 18–21 years, 2 = 22–25 years, 3 = 26–29 years, 4 = 30–33 years, 5 = 34–36 years, 6 = 37+ years. \* $p < .05$ , \*\* $p < .01$ .

SCDs and strain, if and only if the other demand is low. Put differently, in cases of simultaneous coping with two stressors, trait self-control fails to prevent one from feeling strained. We thereby identified boundary conditions of the protective function of trait self-control. From a perspective of ISCT, the present interaction pattern is in line with the mechanistic notion that the trait component of the control capacity is only able to stabilize well-being when coping with one stressor. In other words, the trait component determines whether strain disproportionately increases only in cases of two stressors (high trait self-control) or even in



**Figure 1.** Three-way interaction of trait self-control and academic and job-related SCDs on irritation ( $N = 163$ ).

the presence of one stressor (low trait self-control), whereas, however, two stressors overtax the overall capacity during self-control exertion and inevitably result in disproportionately high strain.

Despite initial evidence for our proposition, our results are subject to several methodological limits. First, complex interactions are often contingent upon specific contextual circumstances and may not materialize in different samples (Shieh, 2007). Thus, we cannot rule out that the present interaction results from specific distributional characteristics of our sample. Second, and related to the first issue, our sample was exclusively restricted to fully employed students whose objective SCDs are probably quite homogeneous, because all of them hold full-time employment and are enrolled in an occupational study program. That is, our findings may not be generalizable to other populations, which involve full-time students with part-time jobs also facing different sources of stress. Third, although well-established measures of SCDs discriminate between occupational roles, work tasks, and professional groups with different levels of job requirements (Schmidt & Neubach, 2010), an indicator, which is largely unaffected by self-report biases and directly assesses the amount of workload, may improve our design and provide more valid findings about the hypothesized interaction patterns.

To address these limitations, we conducted a second study with a more heterogeneous sample, which consists of students without parallel employment, with part-time employment and those who are fully employed. We introduced average study and working time per week (in hours) as more objective indicators (as compared to perceptual indicators of SCDs) for the degree of demands in both spheres (Valcour, 2007). According to a meta-analysis (Sparks, Cooper, Fried, & Shirom, 1997), working hours

are positively related to strain and thus reflect the extent to which employees are potentially faced with stressful events at work and required to regulate themselves according to job demands. In addition, working hours have been found to impair work-life balance and interfere with duties in other life domains (Valcour, 2007). In a similar vein, we argue that study time per week indicates the degree of one's entanglement in tasks, processes, and duties related to academic studies.

Consequently, we conceptualized study and working time per week as potential sources of SCDs, which tax the control capacity and thus interact with each other, and directly assessed SCDs as well as trait self-control in predicting psychological strain. In particular, regardless of the level of trait self-control, those with high study and working time per week should experience disproportionately high strain, when they are faced with high SCDs in the other domain. In contrast, in cases of low study and working time per week, trait self-control should attenuate the positive relationship of SCDs to strain. Thus, we propose the following additional hypotheses:

*Hypothesis 2:* Trait self-control, job-related SCDs, and study time per week (in hours) interact in predicting psychological strain: The relationship of job-related SCDs to strain is weakest when the study time per week is low and trait self-control is high. In comparison, in all other cases (the study time per week is high and/or trait self-control is low), SCDs are stronger and positively related to strain.

*Hypothesis 3:* Trait self-control, academic SCDs, and working time per week (in hours) interact in predicting psychological strain: The relationship of academic

SCDs to strain is weakest when the working time per week is low and trait self-control is high. In comparison, in all other cases (the working time per week is high and/or trait self-control is low), SCDs are stronger and positively related to strain.

*Hypothesis 4:* Trait self-control, study times per week, and working time per week (in hours) interact in predicting psychological strain: The relationship of study times per week to strain is weakest when the working time per week is low and trait self-control is high. In comparison, in all other cases (the working time per week is high and/or trait self-control is low), study times per week are stronger and positively related to strain.

## Study 2

### Method

Again, we recruited participants from two German universities of applied sciences via mailings and during lectures. In contrast to Study 1, the participants were either fully employed (39.1%) or partially employed (32.3%) or not formally employed, but may have a side job (28.6%). In sum, a final sample of 135 students who were studying for a bachelor or master degree provided data for all relevant study variables. Participants were between 18 and 35 years of age ( $M = 23.73$ ,  $SD = 3.68$ ), and 67.4% were women.

We assessed *irritation*, *trait self-control*, *job-related* and *academic SCDs* on the basis of the same measures as in Study 1. Again, according to CFA, both measures of SCDs seem to reflect different constructs [2-factor model:  $\chi^2(34) = 95.63$ ,  $p < .01$ , RMSEA = .116, CFI = .916, SRMR = .047; 1-factor model:  $\chi^2(35) = 781.08$ ,  $p < .01$ , RMSEA = .397, CFI = .000, SRMR = .187]. In addition, to assess *study and working time per week*, we asked the participants the following questions: “On average, how many hours do you study in a typical week?” and “On average, how many hours do you work in a typical week?” (see also Valcour, 2007).

## Results

Drawing from the analytical procedure in Study 1, we applied moderated regression analyses to test the three-way interactions between academic and job-related SCDs, trait self-control, and study time per week, as well as working time per week. That is, for each of the three hypotheses, we introduced the main effect variables (gender, age, job-related and academic SCDs, as well as trait self-control) in the first step, whereas all two-way interactions and the three-way interaction were integrated in the second and third steps, respectively.

Table 3 displays descriptive statistics, intercorrelations, and reliabilities, while the results of the moderated regression analyses are depicted in Table 4. Whereas job-related SCDs and trait self-control were significantly associated with irritation with signs corresponding to expectations, academic SCDs failed to exhibit positive relations to irritation. In line with prior studies, both study and working time per week significantly predicted irritation. In the final steps, only the interaction between job-related SCDs, study time per week, and trait self-control explained significant proportions in variance of irritation over and beyond that accounted for by the main and two-way interaction effects (Hypothesis 2). The incremental amount of explained variance was 7% ( $p < .01$ ). The other three-way interactions were insignificant in predicting irritation (Hypotheses 1, 3, and 4).

As in Study 1, on the basis of the simple slope method, we analyzed the form of the significant three-way interaction between job-related SCDs, study time per week, and trait self-control (Figure 2): When trait self-control was high, the positive relations of SCDs to irritation were amplified as a function of study time per week, whereas in cases of low trait self-control, study time per week attenuated the positive relation of job-related SCDs to irritation. In particular, SCDs were significantly and positively associated with irritation, when either trait self-control and study time per week were high or both were low. In conclusion, and consistent with Hypothesis 2, those with high trait self-control did not report an increase in irritation with increasing

**Table 3.** Descriptive results,  $\alpha$  reliabilities, and intercorrelations (Study 2)

	<i>M</i>	<i>SD</i>	$\alpha$	1.	2.	3.	4.	5.	6.	7.
1. Irritation	3.30	1.34	.90							
2. Gender	1.67	0.47	–	.07						
3. Age	23.73	3.68	–	–.04	–.07					
4. Job-related self-control demands	2.86	1.00	.91	.36**	–.01	.13				
5. Academic self-control demands	3.29	0.96	.89	.15	–.10	.04	.35**			
6. Trait self-control	3.11	0.63	.83	–.32**	.07	.06	–.41**	–.41**		
7. Working time per week (in hr)	24.51	17.36	–	.04	–.13	.40**	–.01	.16	.03	
8. Study time per week (in hr)	22.33	15.99	–	.20*	.05	–.39**	.00	–.07	.05	–.52**

Note. Gender: 1 = male, 2 = female. \* $p < .05$ , \*\* $p < .01$ .

**Table 4.** Results of multiple regression analysis for predicting irritation (Study 2)

Model	Hypothesis 1		Hypothesis 2		Hypothesis 3		Hypothesis 4	
	$\beta$	<i>t</i>	$\beta$	<i>t</i>	$\beta$	<i>t</i>	$\beta$	<i>t</i>
Step 1 – Predictors								
Gender	.10	1.29	.11	1.41	.11	1.36	.13	1.62
Age	-.02	-0.16	-.03	-0.31	-.02	-0.18	-.03	-0.35
Working time per week (in hr)	.24	2.42**	.30	3.16**	.28	2.52**	.33	3.17**
Study time per week (in hr)	.32	3.35**	.46	4.64**	.33	3.49**	.40	3.70**
Job-related self-control demands	.31	3.19**	.24	2.76**	.25	2.70**	.27	3.02**
Academic self-control demands	-.10	-1.06	-.10	-1.09	-.07	-0.76	-.08	-0.81
Trait self-control	-.22	-2.31**	-.21	-2.40**	-.25	-2.72**	-.35	-2.86**
$R^2$	.26		.26		.26		.26	
<i>F</i>	6.22**		6.22**		6.22**		6.22**	
Step 2 – Two-way interaction								
Job-Related Self-Control Demands × Academic Self-Control Demands	-.18	-1.68						
Job-Related Self-Control Demands × Trait Self-Control	-.02	-0.23	-.03	-0.36				
Academic Self-Control Demands × Trait Self-Control	-.13	-1.18			-.06	-0.66		
Working Time Per Week × Academic Self-Control Demands					-.09	0.93		
Working Time Per Week × Trait Self-Control					.04	0.45	.03	.29
Study Time Per Week × Job-Related Self-Control Demands			.02	0.24				
Study Time Per Week × Trait Self-Control			-.06	-0.72			-.04	-.30
Working Time Per Week × Study Time Per Week							.13	1.30
$\Delta R^2$	.02		.02		.00		.01	
$\Delta F$	0.87		0.86		0.11		0.80	
Step 3 – Three-way interaction								
Job-Related Self-Control Demands × Academic Self-Control Demands × Trait Self-Control	-.09	-0.85						
Job-Related Self-Control Demands × Study Time Per Week × Trait Self-Control			.32	3.56**				
Academic Self-Control Demands × Working Time Per Week × Trait Self-Control					-.01	-0.10		
Study Times Per Week × Working Time Per Week × Trait Self-Control							-.16	-1.22
$\Delta R^2$	.004		0.07		.00		.01	
$\Delta F$	0.729		13.70**		0.00		1.48	

Note. Gender: 1 = male, 2 = female. \* $p < .05$ , \*\* $p < .01$ .

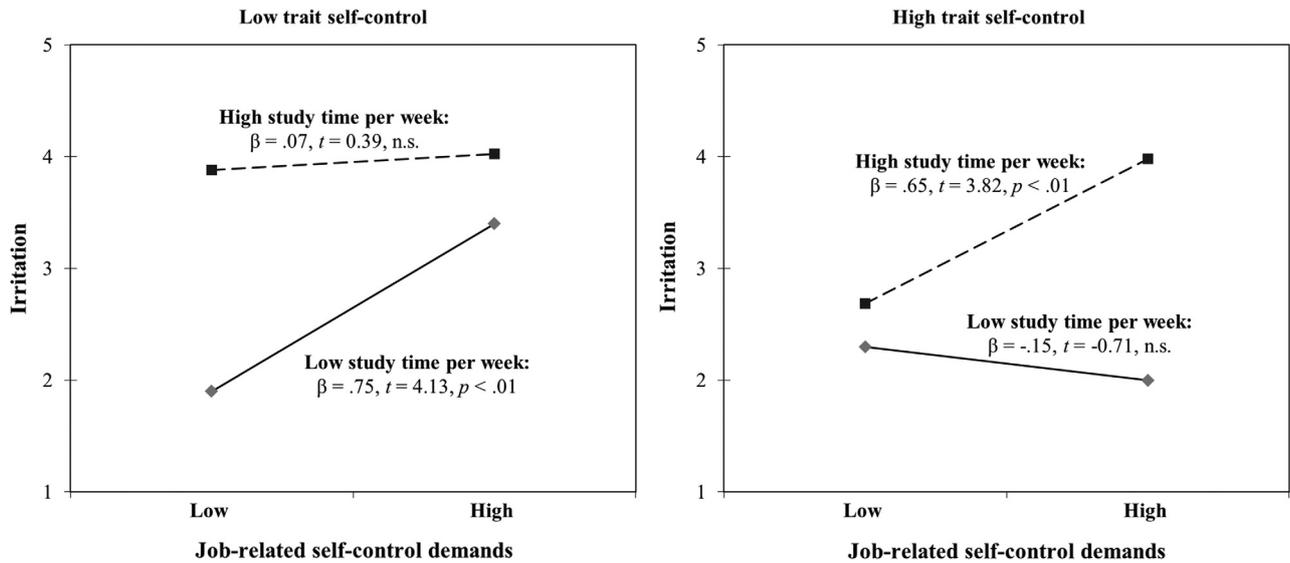
job-related SCDs, when they did not spend much time in academic study. In all other cases, job-related SCDs resulted in strain or strain was constantly high.

## General Discussion

In the present research, we examined the interplay of different kinds of stressors and trait self-control in predicting psychological strain. In exploring the boundary conditions of the protective function of trait self-control, we tested moderating effects of trait self-control on the positive

relationships of two different simultaneously occurring stressors to irritation. Drawing from ISCT (Kotabe & Hofmann, 2015), we proposed that trait self-control enables successful coping with only one stressor, whereas in cases of multiple stressors even those with high trait self-control will experience disproportionately high strain. On the basis of our proposition, we derived hypotheses on interaction effects of trait self-control with job-related and academic SCDs as well as study and working times per week as potential sources of stress.

In the first sample which consisted of occupational students enrolled in an occupational study program, trait



**Figure 2.** Three-way interaction between job-related SCDs, study time per week, and trait self-control ( $N = 135$ ).

self-control buffered the positive relationship of job-related SCDs to strain when academic SCDs were low, whereas in cases of low trait self-control or high academic SCDs, job-related SCDs were strongly and positively related with strain. In the second sample which was more heterogeneous and involved students who were fully or partially or not formally employed, we sought to replicate the interaction of both SCDs and trait self-control on strain. In addition, we extended the spectrum of potential stressors by including study and working times per week as demands, which are less contaminated by self-report biases. We found an interaction of trait self-control, job-related SCDs, and study hours per week in predicting irritation: For individuals with low trait self-control, job-related SCDs were positively associated with irritation when study times per week were low, whereas in cases of high study times per week, irritation was constantly high. In contrast, under conditions of high trait self-control, both stressors mutually amplified each other in their effects on irritation. However, the other interaction effects – even the interaction of both SCDs and trait self-control of Study 1 – failed to reach significance. In sum, given that two of five analyses were in line with our hypotheses, our data thus provided mixed support for our propositions.

In an attempt to interpret the significant interactions, we believe that in general, in cases of low trait self-control, the control capacity should be more rapidly depleted when one (occupational or academic) domain is demanding. That is, regardless of one or two stressors, strain increases with increasing levels of demands. In comparison, in cases of high trait self-control, the capacity is only depleted by two sources of stress, while those with high trait self-control are able to put high effort into coping with one stressor

when the other is low. Thus, the relationship of one stressor to strain is amplified by the other stressor when trait self-control is high. In our studies, such an interaction pattern did not emerge for all combinations of SCDs and study or working times per week. To some extent, both significant interactions indicate that even those who are well able to resist distractions, override their response tendencies or overcome inner motivational resistances and thus exhibit high self-discipline experience high psychological strain in the presence of multiple stressors. While most empirical evidence indicates that trait self-control prevents strain and self-control deficits in cases of high stress, we were able to identify the limits of the protective function of trait self-control in coping with sources of stress. In the following, we elaborate on the implications of our findings.

## Theoretical Implications

We see two main theoretical implications. Firstly, past research repeatedly revealed interactions of two stressors, which are hypothesized to put high demands on self-control and mutually amplified each other in their deleterious effects on psychological strain (e.g., Diestel & Schmidt, 2011; Zapf, Seifert, Schmutte, Mertini, & Holz, 2001). According to ISCT, given that the control capacity is limited, simultaneous coping with two stressors, which draw on the same capacity, produces higher levels of strain than the sum of their main effects. In extending our knowledge about the effects of multiple stressors, the present interaction patterns show that multiple stressors may not only lead to disproportionately high strain, but also impede the usage of protective resources for coping with stress. In line with

the job demands-resources model (Bakker & Demerouti, 2007), which disentangles processes of strain, as well as motivation, and proposes that demands can attenuate the beneficial effects of resources on well-being, the simultaneous occurrence of multiple stressors can constitute a boundary condition under which personal resources fail to reduce strain.

Secondly, as noted above, we could not replicate the interaction effect between trait self-control, job-related SCDs, and academic SCDs on irritation in the second sample. In addition, the two other interactions with different combinations also did not emerge. Therefore, the present findings from both studies are not consistent and should be interpreted tentatively. On the one hand, the presence of two high SCDs in different contexts might have been differentially experienced: that is, whereas occupational students (Sample 1) may have suffered more from SCDs because of, for example, dysfunctional or straining time schedules (e.g., lectures after working time, working and studying in the evening, more complicated coordination with others), regular students probably benefit from more autonomy and thus are better able to cope with overcoming inner resistances. On the basis of additional subgroup analyses in Sample 2, we found a stronger (but insignificant) three-way interaction of both SCDs and trait self-control with signs corresponding to expectations for those who have at least a part-time job (as compared to those who were not formally employed). We interpret this finding as an indication for the argument that the perception of two simultaneously occurring SCDs may somewhat differ between types of employment.

On the other hand, study time per week does not directly reflect the extent to which individuals are required to engage in volitional self-control. However, Prem et al. (2016) have revealed mediating effects of SCDs in the positive relations of workload, as well as time pressure, to indicators of strain, and thus demonstrated that dysfunctional conditions such as quantitative demands exert their deleterious effects on strain through exerting volitional self-control, which taxes the control capacity. That is, at least to some extent, study or working time per week can put high demands on volitional self-control. In light with the strong relationship of job-related SCDs to irritation in Study 2, study times per week may have caused employees to engage in volitional self-control (even more than academic SCDs or working times per week), because they had to cope with SCDs at work, were already depleted or strained, and thus perceived high study times as a SCD, which interact other SCDs and trait self-control. Since the form of both significant interaction effects is somewhat similar, we argue that the same underlying psychological mechanism, which relies on a dysfunctional interplay between the limited control capacity and additional enactment constraints, materi-

alizes in both interactions. The extent to which potential sources of stress require high volitional self-control might depend upon the specific occupational setting. Whereas the present results are somewhat strongly suggestive, but not highly convincing in terms of an exact replication, however, both significant interactions indicate that trait self-control can fail to prevent irritation when coping with two stressors.

## Limitations

Our study has limitations. Firstly, previous research has manipulated state self-control in laboratory settings by varying (more or less objectively) SCDs. Field experiments on academic SCDs use examination periods as a dichotomous indicator for high SCDs and therefore may suffer from variance restrictions. In contrast, we measured academic and job-related SCDs as continuous variables, because such measures capture natural variation in perceptions of demands.

Secondly, our results are based upon cross-sectional self-report data and do not allow causal conclusions in a strict sense. However, because our analyses draw from two samples and we employed different operationalizations of the stress variables, we can provide some confidence in our findings. Notably, in Study 2, we used more objective indicators of sources of stress (compared to the self-report SCDs-measures), which reflect the amount of time spent in the academic and job domains and thus strengthen our design. Notwithstanding, experience event sampling or longitudinal studies may provide additional evidence for our propositions.

Thirdly, we only focused on irritation as an indicator of psychological strain, which is typically more broadly conceptualized compared to emotional and cognitive symptoms (Sonnentag & Frese, 2013). However, we believe that irritation particularly indicates deficits in the enactment phase of exercising self-control (Lian et al., 2017), because its symptoms refer to perceived deficits in detachment and behavioral failures in exerting self-control (e.g., anger). Nevertheless, future research may also consider other indicators of strain, such as exhaustion or even physiological measures (Ilies, Aw, & Lim, 2016).

Fourthly, given the complexity of our results, the present sample sizes do not seem large enough to have strong confidence in them. However, in light of simulation studies (Dawson & Richter, 2006), our sample sizes provide a sufficient basis for taking our results seriously.

Fifthly, our measures and results do not necessarily show whether the level of experienced strain is accounted for by two different kinds of stressors, which require volitional self-control, in both settings or might be due to an additional source of stress in the same setting. For example,

in Sample 1, some of the participants might have high job-related SCDs at a level that would be experienced if they were working a second job in the evening (instead of studying). Such distributional patterns imply quadratic effects of SCDs on strain: In both studies, however, additional analyses failed to provide evidence of nonlinear relations of SCDs to irritation. Nevertheless, the question of perceptual biases in self-report assessments of specific demands still remains somewhat methodologically unanswered (Spector, Fox, & Van Katwyk, 1999).

## Practical Implications

The present findings may have good applicability in advising individuals about whether or not they can handle two large commitments (work and study) simultaneously. We see self-regulation as a central issue for career counseling of occupational students. Universities, for example, may provide support for students who are working parallel to their academic studies through stress-reduction programs, psychological counseling, or self-management trainings.

Additionally, online-based self-assessments, which provide differential feedback about one's psychological well-being, could include SCDs, trait self-control, and other relevant occupational characteristics (e.g., workload). Based on such feedback, employees can better decide whether they are capable of enrolling in an occupational study program without taking much risk of psychological strain. Conversely, students may also benefit from such self-assessments when they face multiple demands due to (side) jobs. An example for such self-assessments is provided by Kallus and Kellmann (2015) who developed and validated a questionnaire for recovery and stress.

Finally, to prevent high SCDs in the academic context, structural support may be facilitated by blended learning, flexible scheduling, and autonomy in selecting subjects, as well as examinations. Integrated learning methods (such as blended learning) may facilitate self-regulation and well-being through the usage of various online and offline tools, which reduce time pressure and enlarge autonomy (Rossett, 2002).

In sum, our findings accentuate the importance of focusing on potentially stressful conditions for those who are faced with multiple demands in different life domains. Individual characteristics or personal resources may not always provide sufficient protection, especially when demands exceed one's capacity for self-control.

## References

- Bakker, A. B., & Demerouti, E. (2007). The job demands-resources model: State of the art. *Journal of Managerial Psychology*, 22, 309–328. <https://doi.org/10.1108/02683940710733115>
- Beedie, C.J., & Lane, A.M. (2012). The role of glucose in self-control: Another look at the evidence and an alternative conceptualization. *Review Personality and Social Psychology*, 16, 143–153. <https://doi.org/10.1177/1088868311419817>
- Bertrams, A., & Dickhäuser, O. (2009). Messung dispositioneller Selbstkontroll-Kapazität [Measuring dispositional self-control capacity]. *Diagnostica*, 55, 2–10. <https://doi.org/10.1026/0012-1924.55.1.2>
- Carter, E. C., Kofler, L. M., Forster, D. E., & McCullough, M. E. (2015). A series of meta-analytic tests of the depletion effect: Self-control does not seem to rely on a limited resource. *Journal of Experimental Psychology: General*, 144, 796–815. <https://doi.org/10.1037/xge0000083>
- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). Mahwah, NJ: Erlbaum.
- Dang, J. (2018). An updated meta-analysis of the ego depletion effect. *Psychological Research*, 82, 645–651. <https://doi.org/10.1007/s00426-017-0862-x>
- Dawson, J., & Richter, A. W. (2006). Probing three-way interactions in moderated multiple regression. *Journal of Applied Psychology*, 91, 917–926. <https://doi.org/10.1037/0021-9010.91.4.917>
- de Ridder, D. T., Lensvelt-Mulders, G., Finkenauer, C., Stok, F. M., & Baumeister, R. F. (2012). Taking stock of self-control: A meta-analysis of how trait self-control relates to a wide range of behaviors. *Personality and Social Psychology Review*, 16, 76–99. <https://doi.org/10.1177/1088868311418749>
- Diestel, S., & Schmidt, K.-H. (2011). Costs of simultaneous coping with emotional dissonance and self-control demands at work. *Journal of Applied Psychology*, 96, 643–653. <https://doi.org/10.1037/a0022134>
- Diestel, S., Rivkin, W., & Schmidt, K.-H. (2015). Sleep quality and self-control capacity as protective resources in the daily emotional labor process. *Journal of Applied Psychology*, 100, 809–827. <https://doi.org/10.1037/a0038373>
- Hagger, M. S., Wood, C., Stiff, C., & Chatzisarantis, N. L. D. (2010). Ego depletion and the strength model of self-control: A meta-analysis. *Psychological Bulletin*, 136, 495–525. <https://doi.org/10.1037/a0019486>
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis*. New York, NY: Guilford Press.
- Hülshager, U. R., & Schewe, A. F. (2011). On the costs and benefits of emotional labor: A meta-analysis of three decades of research. *Journal of Occupational Health Psychology*, 16, 361–389. <https://doi.org/10.1037/a0022876>
- Ilies, R., Aw, S. S., & Lim, V. K. (2016). A naturalistic multilevel framework for studying transient and chronic effects of psychosocial work stressors on employee health and well-being. *Applied Psychology*, 65, 223–258. <https://doi.org/10.1111/apps.12069>
- Kallus, K. W., & Kellmann, M. (2015). *Recovery-stress questionnaires*. Frankfurt am Main, Germany: Pearson.
- Kotabe, H. P., & Hofmann, W. (2015). On integrating the components of self-control. *Perspectives on Psychological Science*, 10, 618–638. <https://doi.org/10.1177/1745691615593382>
- Lian, H., Yam, K. C., Ferris, D. L., & Brown, D. (2017). Self-control at work. *Academy of Management Annals*, 11, 703–732. <https://doi.org/10.5465/annals.2015.0126>
- Lian, H., Brown, D. J., Ferris, D. L., Liang, L. H., Keeping, L. M., & Morrison, R. (2014). Abusive supervision and retaliation: A self-control framework. *Academy of Management Journal*, 57, 116–139. <https://doi.org/10.5465/amj.2011.0977>
- Miyake, A., Friedman, N. P., Emerson, M. J., Witzki, A. H., How- ertter, A., & Wager, T. D. (2000). The unity and diversity of executive functions and their contributions to complex “frontal

- lobe" tasks: A latent variable analysis. *Cognitive Psychology*, 41, 49–100. <https://doi.org/10.1006/cogp.1999.0734>
- Mohr, G., Rigotti, T., & Mueller, A. (2005). Irritation – ein Instrument zur Erfassung psychischer Beanspruchung im Arbeitskontext. Skalen- und Itemparameter aus 15 Studien [Irritation – an instrument assessing mental strain in working contexts. Scale and item parameters from 15 studies]. *Zeitschrift für Arbeits- und Organisationspsychologie*, 49, 44–48. <https://doi.org/10.1026/0932-4089.49.1.44>
- Muraven, M., & Baumeister, R. F. (2000). Self-regulation and depletion of limited resources: Does self-control resemble a muscle? *Psychological Bulletin*, 126, 247–259. <https://doi.org/10.1037/0033-2909.126.2.247>
- Oaten, M., & Cheng, K. (2005). Academic examination stress impairs self-control. *Journal of Social and Clinical Psychology*, 24, 254–279. <https://doi.org/10.1521/jscp.24.2.254.62276>
- Oaten, M., & Cheng, K. (2006). Improved self-control: The benefits of a regular program of academic study. *Basic and Applied Social Psychology*, 28, 1–16. [https://doi.org/10.1207/s15324834basp2801\\_1](https://doi.org/10.1207/s15324834basp2801_1)
- Prem, R., Kubicek, B., Diestel, S., & Korunka, C. (2016). Regulatory job stressors and their within-person relationships with ego depletion: The role of state anxiety, self-control effort, and job autonomy. *Journal of Vocational Behavior*, 92, 22–32. <https://doi.org/10.1016/j.jvb.2015.11.004>
- Prem, R., Paškván, M., Kubicek, B., & Korunka, C. (2018). Exploring the ambivalence of time pressure in daily working life. *International Journal of Stress Management*, 25, 35–43. <https://doi.org/10.1037/str0000044>
- Rossett, A. (2002). *The ASTD e-learning handbook*. New York, NY: McGraw-Hill.
- Schmidt, K.-H., & Diestel, S. (2015). Self-control demands: From basic research to job-related applications. *Journal of Personnel Psychology*, 14, 49–60. <https://doi.org/10.1027/1866-5888/a000123>
- Schmidt, K.-H., Hupke, M., & Diestel, S. (2012). Does dispositional capacity for self-control attenuate the relation between self-control demands at work and indicators of job strain? *Work & Stress*, 26, 21–38. <https://doi.org/10.1080/02678373.2012.660367>
- Schmidt, K.-H., & Neubach, B. (2010). Selbstkontrollanforderungen bei der Arbeit – Fragebogen zur Erfassung eines bislang wenig beachteten Belastungsfaktors [Self-control demands – Questionnaire for measuring a job stressor largely neglected thus far]. *Diagnostica*, 56, 133–143. <https://doi.org/10.1026/0012-1924/a000015>
- Schmitt, A., Zacher, H., & Frese, M. (2012). The buffering effect of selection, optimization, and compensation strategy use on the relationship between problem solving demands and occupational well-being: A daily diary study. *Journal of Occupational Health Psychology*, 17, 139–149. <https://doi.org/10.1037/a0027054>
- Shieh, G. (2007). A unified approach to power calculation and sample size determination for random regression models. *Psychometrika*, 72, 347–360. <https://doi.org/10.1007/s11336-007-9012-5>
- Shoda, Y., Mischel, W., & Peake, P. K. (1990). Predicting adolescent cognitive and self-regulatory competencies from preschool delay of gratification. *Developmental Psychology*, 26, 978–986. <https://doi.org/10.1037/0012-1649.26.6.978>
- Sonnentag, S., & Frese, M. (2013). Stress in organizations. In W. C. Borman, D. R. Ilgen, & R. J. Klimoski (Eds.), *Comprehensive handbook of psychology* (Vol. 12, pp. 453–491). Hoboken, NJ: Wiley.
- Sparks, K., Cooper, C., Fried, Y., & Shirom, A. (1997). The effects of hours of work on health: A meta-analytic review. *Journal of Occupational & Organizational Psychology*, 70, 391–408. <https://doi.org/10.1111/j.2044-8325.1997.tb00656.x>
- Spector, P. E., Fox, S., & Van Katwyk, P. T. (1999). The role of negative affectivity in employee reactions to job characteristics: Bias effect or substantive effect? *Journal of Occupational and Organizational Psychology*, 72, 205–218. <https://doi.org/10.1348/096317999166608>
- Stoeberl, J., Childs, J. H., Hayward, J. A., & Feast, A. R. (2011). Passion and motivation for studying: Predicting academic engagement and burnout in university students. *Educational Psychology*, 31, 513–528. <https://doi.org/10.1080/01443410.2011.570251>
- Stumm, S., Thomas, E., & Dormann, C. (2010). Selbstregulationsstärke und Leistung – Dualer Prädiktor im dualen Hochschulstudium [Self-regulatory strength and performance: Dual predictor in cooperative university education]. *Zeitschrift für Arbeits- und Organisationspsychologie A&O*, 54, 171–181. <https://doi.org/10.1026/0932-4089/a000029>
- Tangney, J. P., Baumeister, R. F., & Boone, A. L. (2004). High self-control predicts good adjustment, less pathology, better grades, and interpersonal success. *Journal of Personality*, 72, 271–322. <https://doi.org/10.1111/j.0022-3506.2004.00263.x>
- Thomas, J., & Mengel, T. (2008). Preparing project managers to deal with complexity – advanced project management education. *International Journal of Project Management*, 26, 304–315. <https://doi.org/10.1016/j.ijproman.2008.01.001>
- Valcour, M. (2007). Work-based resources as moderators of the relationship between work hours and satisfaction with work-family balance. *Journal of Applied Psychology*, 92, 1512–1523. <https://doi.org/10.1037/0021-9010.92.6.1512>
- Vohs, K. D., & Faber, R. J. (2007). Spent resources: Self-regulatory resource availability affects impulse buying. *Journal of Consumer Research*, 33, 537–547. <https://doi.org/10.1086/510228>
- Yam, K. C., Fehr, R., Keng-Highberger, F. T., Klotz, A. C., & Reynolds, S. J. (2016). Out of control: A self-control perspective on the link between surface acting and abusive supervision. *Journal of Applied Psychology*, 101, 292–301. <https://doi.org/10.1037/apl0000043>
- Zapf, D., Seifert, C., Schmutte, B., Mertini, H., & Holz, M. (2001). Emotion work and job stressors and their effects on burnout. *Psychology and Health*, 16, 527–545. <https://doi.org/10.1080/08870440108405525>
- Zettler, I. (2011). Self-control and academic performance: Two field studies on university citizenship behavior and counterproductive academic behavior. *Learning and Individual Differences*, 21, 119–123. <https://doi.org/10.1016/j.lindif.2010.11.002>

## History

Received April 30, 2017

Revision received May 21, 2018

Accepted June 6, 2018

Published online January 9, 2019

## Authorship

Kai Externbrink and Stefan Diestel contributed equally to the manuscript and share first authorship.

## ORCID

Kai Externbrink

 <https://orcid.org/0000-0001-9600-3393>

## Kai Externbrink

Department of Business and Psychology

FOM University of Applied Sciences

Lissaboner Allee 7

44269 Dortmund

Germany

[kai.externbrink@fom.de](mailto:kai.externbrink@fom.de)