

## Appreciation by Supervisors Buffers the Impact of Work Interruptions on Well-Being Longitudinally

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This study analyzed the effects of work interruptions as a stressor and appreciation of employees by supervisors as a resource with regard to four parameters of well-being, postulating main effects and interactions. Using latent moderated structural equation modeling, we analyzed longitudinal data on 208 employees at seven different companies who completed an online questionnaire twice. There were no main effects; however, the interactions between work interruptions and appreciation by supervisors were significant, and in the expected direction. Appreciation by supervisors moderated the effects of interruptions on the four parameters of employees' well-being: job satisfaction, self-efficacy, job-related depressive mood, and sleep problems. These results held after accounting for conceptually relevant control variables, namely, time pressure, job control, and social support by supervisors. There were no indications for reversed effects. The findings underscore the importance of contextual factors like appreciative leader behavior for handling difficult situations such as work interruptions and thus confirm the potential of feeling appreciated at work as a protective resource in stressful work situations.

*Keywords:* work interruptions, appreciation at work, leadership, longitudinal, well-being

Employee well-being is often predicted not only by job demands but also by job resources (Bakker, Demerouti, & Euwema, 2005; Karasek, 1979). Increasingly, dealing with interruptions has

become a job demand within the modern workplace (Jett & George, 2003). Work interruptions have been shown to have short-term detrimental effects (Baethge & Rigotti, 2013), long-term ef-

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fects have been suggested (Baethge, Rigotti, & Roe, 2015), but require more empirical support. Interruptions are likely to threaten one's self-image as a competent and high-performing person (Hair, Renaud, & Ramsay, 2007). Given the prevalence of work interruptions, it is important to consider ways to reduce them. However, because work interruptions are often unavoidable, it seems especially important to find resources to buffer their effects on well-being. Research suggests that appreciation is an important resource that satisfies basic human needs (Baumeister, 2012; Kemeny, 2009; Siegrist, 2000). Appreciation at work affects employee well-being and health (van Vegchel, De Jonge, Bakker, & Schaufeli, 2002) and should buffer the impact of stressors that may threaten one's reputation (which applies to interruptions, as we argue below). However, to the best of our knowledge, there is no empirical research testing the buffering effect of appreciation at work in connection with work interruptions. To fill this research gap, the present study aims to analyze the interplay of work interruptions and appreciation at work from one's supervisors.

Our research makes three key contributions. First, we examine the effects of two specific but important variables—work interruptions as a stressor and appreciation by supervisors as a resource—and their interaction with four different indicators of employee well-being: job satisfaction, self-efficacy, job-related depressive mood, and sleep problems. Second, we looked at these effects using a two-wave design, which makes it possible to control for the initial values of dependent variables and to investigate reversed effects. Finally, to demonstrate that our predictors are not redundant with regard to established predictors, we controlled for time pressure, which is a well-established task-related stressor (Sonnetag & FrESE, 2012), for job control as a well-established and task-related resource (Karasek, 1979), and for social support as a resource that is not only well-established (Viswesvaran, Sanchez, & Fisher, 1999) but also conceptually close to appreciation.

### **Stress-as-Offense Theory as the Guiding Framework for This Research**

Stress-as-offense-to-self (SOS) theory (Semmer, Jacobshagen, Meier, & Elfering, 2007) focuses on the individual's need to maintain high self-esteem, in terms of both personal and

social self-esteem (Alicke & Sedikides, 2009; Leary, 2012; Miller, 2001). The proponents of SOS theory claim that self-concerns are pervasive enough to likely play a greater role in stress and health than is typically assumed in the field of occupational health psychology and that threats and boosts to the self should receive more attention. SOS theory considers appreciation as a core resource with strong consequences because appreciation very directly communicates esteem, respect, and acknowledgment.

SOS theory not only focuses on direct communication of appreciation or derogation but also suggests that many subtler features of the work environment (e.g., autonomy and ergonomic design) may likewise communicate (lack of) appreciation (Semmer, Meier, & Beehr, 2016). Therefore, effects on self-esteem should be considered for a broad range of stressors beyond those that are associated with self-esteem in a rather obvious way (Pierce & Gardner, 2004; Pierce, Gardner, Cummings, & Dunham, 1989). We propose here that work interruptions are a candidate for such consideration.

### **Work Interruptions as a Modern-Day Stressor**

Following Brixey et al. (2007), we define "work interruptions" as intrusions by a secondary, unplanned, and unexpected task that cause discontinuity in work. Depending on the research questions, one may focus on internal or external triggers of interruptions (Brixey et al., 2007); our focus is on external triggers, that is, interruptions by other people or external events. With new developments in information technology and open office layouts, such work interruptions are increasingly omnipresent (Jett & George, 2003). Interruptions occur frequently in many professional environments, ranging from medicine (e.g., nursing units: Elfering, Grebner, & Ebener, 2015; surgery: Weigl, Müller, Vincent, Angerer, & Sevdalis, 2012) to a wide variety of office spaces (Banbury & Berry, 2005; Davis, Leach, & Clegg, 2011) and to aviation (Loukopoulos, Dismukes, & Barshi, 2001), including heterogeneous samples (Lin, Kain, & Fritz, 2013). Although interruptions may sometimes have positive consequences (e.g., providing helpful information: Grund-

geiger et al., 2016; Jett & George, 2003), they are mostly associated with strain (Baethge & Rigotti, 2013; Lin et al., 2013; see also Clarke, 2012, who considers interruptions as hindrance stressors).

Work interruptions are likely to be stressful for several reasons. First, they induce additional effort, such as redirecting attention from the initial task to the interruption, often leading to new tasks. Obvious consequences of interruptions are increases in workload and time pressure (Elfering, Grebner, & Haller, 2012; Jett & George, 2003; Weigl et al., 2012). Because the initial task is not yet completed, cognitive resources likely remain associated with the initial task, which increases the load on working memory (Speier, Valacich, & Vessey, 1999). Furthermore, incomplete or interrupted tasks are linked to task-specific tension (the Zeigarnik effect: Zeigarnik, 1927). This tension spurs intrusive thoughts and focuses memory more on unfinished than on finished tasks (Zeigarnik, 1938). After interruptions, employees must return to their initial task, which again consumes mental resources, thus triggering lapses in attention and causing errors (Pereira, Müller, & Elfering, 2015; Westbrook, Coiera, et al., 2010). To complete their initial task, people must use additional effort by, for instance, switching attention between their initial task and the source of the interruption (see the concept of compensatory effort in Meijman & Mulder, 1998). This process induces fatigue and drains resources. Interruptions occurring frequently over extended periods may lead to exhaustion and endanger the attainment of goals in the long run.

The consequence is that frequent interruptions make it more likely that certain tasks are not completed as planned (Baethge et al., 2015; Westbrook, Coiera, et al., 2010). People tend to particularly remember unfinished tasks, which continue to occupy cognitive resources (Syrek, Weigelt, Peifer, & Antoni, 2017) and thus may impair detachment from work, which itself is valuable to the recovery process (Geurts & Sonnentag, 2006). Indeed, decreases in ability to detach following uncompleted tasks have been demonstrated (Smit, 2016), implying that employees stay engaged with work and maintain a state of heightened arousal even after leaving the workplace. Interruptions and the inability to detach deplete personal resources, causing

strain and impairing well-being (through, e.g., poor sleep quality, Syrek & Antoni, 2014).

To the extent that interruptions require additional effort and undermine resources, goal attainment is likely to be impaired in the long run, implying that one's self-image and reputation as a competent and dependable employee may suffer, which may in turn impair self-esteem, including self-esteem that relates to being a respected member of one's organization (organization-based self-esteem; Bowling, Eschleman, Wang, Kirkendall, & Alarcon, 2010; Pierce & Gardner, 2004), and induce an "identity threat" (Gollwitzer, Marquardt, Scherer, & Fujita, 2013; Thoits, 1991). For some tasks, even immediate goal attainment may be undermined when, for example, even small lapses in attention induce serious problems such as clinical errors (Elfering, Nützi, Koch, & Baur, 2014; Westbrook, Woods, Rob, Dunsmuir, & Day, 2010). Such events are likely to represent identity-relevant stressors as well.

In addition to threatening goal attainment, interruptions often are stressful by themselves. Interrupting an ongoing action cycle that is running smoothly can be very irritating (Keller et al., 2016; Li, Magrabi, & Coiera, 2012; Mitchell et al., 2011; Weigl et al., 2018). The irritation associated with disrupted action cycles may be aggravated by attribution processes that involve blaming others for being inconsiderate, rendering the interruption an illegitimate stressor (Semmer et al., 2007). Such attributions are especially likely if the interruption seems to lack a legitimate purpose (such as conveying information needed to finish an ongoing project; Grundgeiger et al., 2016) or is not introduced legitimately, that is, in a way that takes into account the already-in-process work of the person being interrupted (Rivera, 2014).

In sum, interruptions tend to induce additional effort, which over time may cause exhaustion and threaten the attainment of goals. Furthermore, interruptions may be perceived as illegitimate stressors. Both these characteristics are likely to threaten the self. Overall, interruptions should make people less *satisfied*, and they should threaten individuals' self-image as being competent (*self-efficacy*) and confident (*depressive mood*). Furthermore, interruptions should induce concerns about unfinished tasks, which makes it more difficult to relax after work and may induce *sleep problems* due to sustained

arousal. (For elaboration as to why we chose these four outcome variables, see the section “Outcome variables and control variables” in the following text.) We therefore hypothesize that interruptions are associated with job satisfaction, self-efficacy, job-related depressive mood, and sleep problems in the following way:

*Hypothesis 1:* Work interruptions predict job satisfaction (Hypothesis 1a) and self-efficacy (Hypothesis 1b) negatively and job-related depressive mood (Hypothesis 1c) and sleep problems (Hypothesis 1d) positively over time.

### **Appreciation at Work as a Resource**

We define “appreciation” as communicating that one values someone else; the term may refer to (a) unconditionally acknowledging the person as an individual or (b) acknowledging his or her performance, behavior, or qualities (Grover, 2014; van Quaquebeke & Eckloff, 2010). Both aspects can be combined into an assessment of appreciation in general (Bakker, Hakanen, Demerouti, & Xanthopoulou, 2007), which corresponds to the measure of appreciation used in the current study.

Appreciation communicates respect, recognition, or esteem, all of which contribute to positive experiences at work (Alicke & Sedikides, 2009; Dickerson, 2008; Semmer, McGrath, & Beehr, 2005). Because appreciation implies a social evaluation, it relates directly to the self (Leary, 2007, 2012; Kemeny, 2009). Though few people would doubt the importance of social messages that contain threats, or boosts, to the self, research on their effects has not been very systematic in the work context, especially on the positive side (appreciation and acknowledgment; for experimental research on the negative side, see Dickerson, 2008; Kemeny, 2009). Rather, such topics are usually folded into research with a broader focus, such as feedback (London, 2003), social exclusion (Pereira, Meier, & Elfering, 2013), fairness as a sign of one’s social standing (Cohen-Charash & Spector, 2001; de Cremer & Tyler, 2005), or performance evaluation (Stajkovic & Luthans, 2003). Appreciation is one of several rewards in Siegrist’s effort–reward imbalance model (Siegrist, 2005) and is often mentioned as an aspect of leadership. van Quaquebeke and Eck-

loff (2010) discussed respectful leadership, Judge, Piccolo, and Ilies (2004) referred to appreciation as an element of consideration, and Kuoppala, Lamminpää, Liira, and Vainio (2008) mentioned recognition as part of “good leadership,” which is positively related to employee well-being in their meta-analysis.

SOS theory argues that implications for the self constitute a central dimension in the stress experience and therefore deserve more systematic attention (Semmer et al., 2007). The concept implies that appreciation is a “vehicle” to fulfill elementary human needs (Stocker, Jacobshagen, Krings, Pfister, & Semmer, 2014) and should therefore be a candidate for a powerful resource at work. We therefore postulate that appreciation as a “boost” to the self enhances well-being and health and potentially buffers stressors (Semmer et al., 2005, 2007). The few studies that specifically investigate appreciation do point toward its importance. For example, Stocker and colleagues (2014) showed in a diary study that appreciation by supervisors predicted serenity at the end of the workday, Grant and Gino (2010) showed experimentally that thanking people for their effort (an important part of appreciation; Stocker et al., 2014) had an impact on prosocial behavior via feelings of social worth, van Vegchel et al. (2002) identified esteem as the central element of rewards in Siegrist’s (2005) effort–reward imbalance model, and Kube, Maréchal, and Puppe (2012) demonstrated that nonmonetary gifts had a stronger impact on performance than monetary gifts did.

Given that appreciation entails a distinct boost to the self by affirming one’s personal and professional identity (Semmer et al., 2007), and given the positive results of the few studies that investigated appreciation more specifically (Grant & Gino, 2010; Stocker et al., 2014; van Vegchel et al., 2002), we argue that appreciation should be investigated not only within a larger context but also as a resource in its own right. We hypothesize that appreciation is associated with the four outcome variables we specified earlier in the following way:

*Hypothesis 2:* Appreciation by supervisors predicts job satisfaction (Hypothesis 2a) and self-efficacy (Hypothesis 2b) positively and job-related depressive mood

(Hypothesis 2c) and sleep problems (Hypothesis 2d) negatively over time.

## Outcome Variables and Control Variables

### Outcome Variables

Our selection of outcome variables was based on the studies by Warr (2007) and Van Horn, Taris, Schaufeli, and Schreurs (2004). Our aim to include each axis of Warr's (2007) concept of subjective well-being, which itself builds on the emotional circumplex (Cropanzano, Weiss, Hale, & Reb, 2003), led us to look at job satisfaction, self-efficacy, job-related depressive mood, and sleep problems. The first outcome variable, job satisfaction, involves an overall judgment of one's work situation and thus should be sensitive to the stressor (interruptions) and the resource (appreciation) we studied. The second, self-efficacy, which reflects competence (Bandura, 1997; Warr, 2007; Van Horn et al., 2004), should also be relevant in our context, given the threat interruptions pose to reaching one's goals. Threatened or failed goal attainment should be reflected in lower self-efficacy; conversely, appreciation, which is often related to an acknowledgment of one's performance (Stocker et al., 2014) should increase self-efficacy. The third, depressive mood, should increase when goals are missed and thus should be included among the negative feelings associated with interruptions (Baethge et al., 2015); conversely, depressive mood should decrease when one feels appreciated. The fourth, sleep problems, represents a psychosomatic indicator of high-arousal negative affect; these should increase in response to concerns about unfinished tasks and the threats that interruptions pose to goal attainment (for a recent examination of the Zeigarnik effect, see Syrek et al., 2017) and should decrease due to one's being appreciated (Stocker et al., 2014).

### Control Variables

Recent literature cautions against using control variables indiscriminately (Spector & Brannick, 2011). We restricted our use of control variables to three variables that we feel to be especially important: time pressure, job control, and social support. Regarding time pressure, we account for the argument that interruptions of-

ten induce time pressure (Elfering et al., 2012; Jett & George, 2003; Weigl et al., 2012). It therefore is important to ensure that interruptions are not simply a proxy for time pressure but rather constitute an independent predictor of outcome variables. Regarding control, interruptions represent an external intrusion that disregards the focal person's ongoing actions and plans. Therefore, interruptions may, to some extent, be a proxy for lack of control, and we wanted to ensure that they are more than that. As for the third, social support is a variable that substantially overlaps with appreciation; it is specifically emotional support that conveys appreciation (often referred to as "esteem" in this literature), but even the instrumental type of support entails an element of appreciation as well (Semmer et al., 2008). Appreciation and support therefore correlate quite strongly, to the point where concerns have emerged about whether appreciation is merely a proxy for social support (Thoits, 1982). Therefore, we wanted to demonstrate that it is important to assess appreciation directly and that it predicts outcome variables beyond social support.

### Appreciation at Work as a Buffer in the Stress Process

The job demand-control model (Karasek, 1979) is one of the first models suggesting that resources (i.e., control, and, later also, support; Johnson & Hall, 1988) buffer the effects of job demands. More recently, the job demands-resources model (Bakker & Demerouti, 2007) has postulated a more general interaction between job demands and job resources. In this tradition, appreciation at work not only may be considered relevant for job satisfaction and well-being per se (main effect) but also has the potential to buffer the outcome of stressful job demands. If appreciation is as strong a resource as postulated here, it should buffer a wide variety of stressors, as has been shown in several cross-sectional studies (Apostel, Syrek, & Antoni, 2018; Bakker, Hakanen, et al., 2007; Stocker, Jacobshagen, Semmer, & Annen, 2010). There are more specific reasons that appreciation should buffer the outcome variables used in the current study. Job satisfaction is an overall evaluation that is influenced by the degree to which one feels valued and accepted (Pierce & Gardner, 2004). Self-efficacy and job-

related depressive mood relate to one's self-image as competent, confident, and worthy; therefore they should be particularly sensitive to receiving communication about oneself. Sleep problems may arise from concerns about unfinished tasks and unmet goals; such concerns are highly self-relevant and therefore should be sensitive to positive counterinformation contained within appreciation. Because appreciation at work can strengthen a positive professional identity, it may counter such effects of interruptions and protect oneself. Note that the specific content of an appreciative communication need not correspond to the specific content of the threat to self that it attenuates; mechanisms affirming the self can to quite some degree be substituted for one another (Tesser, 2001), which makes appreciation a potential buffer against many different kinds of offense to the self. Furthermore, appreciation is likely to induce a good mood, which may buffer the emotional effects of interruptions such as annoyance and irritation (Fredrickson, Mancuso, Branigan, & Tugade, 2000). We therefore hypothesize as follows:

*Hypothesis 3:* Appreciation at work by supervisors buffers the detrimental effect of work interruptions on job satisfaction (Hypothesis 3a), self-efficacy (Hypothesis 3b), job-related depressive mood (Hypothesis 3c), and sleep problems (Hypothesis 3d) over time.

### Reversed Effects

Although some reviews suggest that reversed effects tend to be found less frequently than effects from conditions at work on well-being (de Lange, Taris, Kompier, Houtman, & Bongers, 2003; Sonnentag & Frese, 2012), the relationship between conditions at work and well-being is not unidirectional, as confirmed by recent meta-analytical findings (Ford et al., 2014). Well-being can influence conditions at work (e.g., people with high self-efficacy perform better and get more appreciative feedback) and one's perception of these conditions (e.g., happy people see the same phenomena more positively). de Lange, Taris, Kompier, Houtman, and Bongers (2005) and Spector, Zapf, Chen, and Frese (2000) have outlined such mechanisms, and many authors (Ford et al.,

2014; Zapf, Dormann, & Frese, 1996) therefore emphasize the need to investigate such effects. In our context, we see reasons that well-being should affect appreciation by supervisors over time: It is usually more pleasant to interact with people high in well-being than with people low in well-being (Boehm & Lyubomirsky, 2008). Furthermore, people high in well-being seem efficient and in control. All these factors might induce supervisors to show more appreciation. Things are different for our second predictor, interruptions. We see little reason why people low in well-being should be interrupted more than those high in well-being. If people high in well-being are more pleasant to deal with, people should enjoy being with them, and therefore they should be interrupted more, not less, than people low in well-being; in contrast, contact with people low in well-being should be avoided. The only reason for more interruptions would be that lack of respect for people low in well-being may render others indifferent to the effect of interrupting those persons, thus inducing them to be think less carefully about possible negative effects of interrupting them; however, it is unclear if this aspect would override the avoidance tendency due to less pleasant interactions. Based on these considerations, we tested the following two research questions:

*Research Question 1:* Do job satisfaction (Research Question 1a) and self-efficacy (Research Question 1b) predict appreciation by supervisors positively, and do job-related depressive mood (Research Question 1c) and sleep problems (Research Question 1d) predict work interruptions negatively over time?

*Research Question 2:* Do job satisfaction (Research Question 2a) and self-efficacy (Research Question 2b) predict interruptions negatively, and do job-related depressive mood (Research Question 2c) and sleep problems (Research Question 2d) predict appreciation by supervisors positively over time?

### Method

#### Participants and Procedure

A legally mandated and publicly funded non-profit foundation in Switzerland offers compa-

nies a free web-based tool to assess stress and resources at work. Participants in the present study are 208 employees at seven different companies who participated twice, with a mean time lag of 13.8 months ( $SD = 5.8$ ), which was individually chosen. The companies operate in several sectors, namely, transportation and storage, financial and insurance activities, landscape service activities, information and communication, and retail. The mean age of participants was 43.4 years ( $SD = 10.4$ ; range = 18 to 66); 37% were women; 7% of participants had completed compulsory schooling, 49% had completed an apprenticeship, 10% had completed high school, and 33% had a university degree. Mean job tenure was 11.2 years ( $SD = 8.8$ ); 35% had a supervisory position. About three-quarters of the participants (76%) worked full time, working an average of 41.4 hr per week ( $SD = 9.4$ ).

## Measures

**Work interruptions.** Work interruptions were assessed with a four-item measure from the Instrument for Stress-Related Job Analysis (ISTA) by Semmer, Zapf, and Dunckel (1995). A sample item is, "How often are you interrupted by colleagues during your work?" Responses were measured on a 5-point scale (1 = *very rarely/never*; 5 = *very often/always*).

**Appreciation by supervisors.** Appreciation by supervisors was assessed with a single item based on the Appreciation at Work Scale by Jacobshagen, Oehler, Stettler, Liechti, and Semmer (2008): "Overall, how satisfied are you with the appreciation of your person shown by your line manager?" The response format ranged from 1 (*extremely unsatisfied*) to 7 (*extremely satisfied*).

**Job satisfaction.** Job satisfaction was assessed with a single item by Semmer, Baillod, and Ruch (1990; Wanous, Reichers, & Hudy, 1997): "How satisfied are you with your work in general?" Responses ranged from 1 (*extremely dissatisfied*) to 7 (*extremely satisfied*).

**Occupational self-efficacy.** Occupational self-efficacy was assessed using the four items of the six-item measure by Rigotti, Schyns, and Mohr (2008) that had the highest item-total correlations. A sample item is, "I can remain calm when facing difficulties in my job because I can rely on my abilities." Responses were

measured on a 6-point scale (1 = *not at all true*; 6 = *completely true*).

**Job-related depressive mood.** Job-related depressive mood was assessed with a three-item measure by Warr (1990). The instruction asks, "Thinking of the past few weeks, how much of the time has your job made you feel each of the following?" The items are "depressed," "gloomy," and "miserable." Responses were measured on a 5-point scale (1 = *never*; 5 = *all of the time*).

**Sleep problems.** Sleep problems were assessed using three items from the Insomnia Severity Index by Bastien, Vallières, and Morin (2001). The instruction asks, "Please rate the current (i.e., last 2 weeks) severity of your possible sleep-related problem(s)." A sample item is, "Difficulty falling asleep." Responses were measured on a 5-point scale (0 = *none*; 4 = *very*).

**Control variables.** *Time pressure* was measured using four items from the ISTA (Semmer et al., 1995). A sample item is, "How often is a fast pace of work required of you?" Responses ranged from 1 (*very rarely/never*) to 5 (*very often/always*). *Job control* was measured using six items from the ISTA. A sample item is, "Considering your work activity in general, how much opportunity is there for you to make your own decisions?" Responses ranged from 1 (*very little*) to 5 (*very much*). *Social support by the supervisor* was assessed with a single item by Frese (1989). Participants had to rate how much they could rely upon their supervisor when things get tough, using a 5-point scale (1 = *not at all*; 5 = *very much*).

## Analytical Approach

We performed structural equation modeling analyses using Mplus Version 8 (Muthén & Muthén, 1998–2017). The latent moderated structural equation models (LMS; Klein & Moosbrugger, 2000) were estimated with the XWITH command. For all models, full-information maximum likelihood with robust standard errors were used. We specified single-item measures by fixing the error variances and used the estimates of Fisher, Matthews, and Gibbons (2016) to calculate the error variances of the three single items.

To assess model fit, we used the root mean squared error of approximation (RMSEA) and

comparative fit index (CFI). Values below .08 for RMSEA and above .95 for CFI are considered to indicate good model fit (Hu & Bentler, 1999). As we had directional hypotheses, one-tailed tests of significance are appropriate (Cho & Abe, 2013; Ludbrook, 2013). The time lag between the two measurements was not identical for all participants; however, controlling for time lag did not yield a significant effect for time lag; variables that were significant without time lag were also significant with time lag included, and no variable was significant that was not significant in a model without time lag. Time lag is therefore not included in the analyses. For the same reason, leadership position is not included in the analyses.

**Results**

Before testing the structural models, we tested for measurement invariance over time. For our multi-item constructs, we constrained factor loadings to be equal over time. Comparing the two models did not reveal significant differences between the unconstrained model, (Satorra–Bentler [SB]  $\chi^2(308) = 368.2$ , RMSEA = .03 (95% confidence interval (CI) [.02, .04]), CFI = .98), and the constrained model (SB  $\chi^2(322) = 376.9$ , RMSEA = .03 (95% CI [.01, .04]), CFI = .98;  $\Delta SB \chi^2 = 7.928$ ,  $\Delta df = 14$ ,  $p = .89$ ).

Descriptive statistics, correlations, and Cronbach’s  $\alpha$  of all measures are shown in Table 1, and the results of the regression LMS analyses in Table 2. Model 0 includes the outcome variables t1 and the main effects of work interruptions and appreciation. Model 0 fit the data well,  $\chi^2(290) = 321.6$ , RMSEA = .02 (95% CI [.00, .04]), CFI = .99. In terms of main effects, no significant effect of work interruptions and appreciation by supervisors on any of the four outcome variables was found (Table 2, Model 0). Thus, Hypotheses 1 and 2 were not supported.

To test Hypothesis 3, Model 1 was estimated (Table 2). The relative fit of Model 1 compared with Model 0 was determined by using a log-likelihood ratio test comparing the log-likelihood values of the two models, resulting in a log-likelihood difference value of  $D = 15.7$ ,  $\Delta df = 4$ ,  $p \leq .01$ , indicating that Model 1 fit the data significantly better than Model 0 did (Gerhard et al., 2015; Maslowsky, Jager, & Hemken,

**Table 1**  
*Means, Standard Deviations, Cronbach’s Alphas, and Correlations Among Study Variables*

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Work interruptions t1	3.41	0.79	(.77)												
2. Appreciation at work by supervisors t1	5.23	1.37	-.19**												
3. Time pressure t1	3.23	0.78	.49**	-.19**											
4. Job control t1	3.83	0.69	.05	.29**	-.14*	(.82)									
5. Social support by supervisors t1	4.10	1.11	-.18*	.70**	-.23**	.26**									
6. Job satisfaction t1	5.18	1.05	-.19**	.55**	-.26**	.32*	.47**								
7. Job satisfaction t2	5.08	1.18	-.19**	.39**	-.15*	.14*	.33**	.55**							
8. Self-efficacy t1	4.51	0.77	-.11	.27**	-.07	.23**	.08	.34**	.23**	(.84)					
9. Self-efficacy t2	4.65	0.76	-.11	.27**	.02	.20**	.06	.35**	.38**	.58**	(.85)				
10. Job-related depressive mood t1	1.74	0.75	.17*	-.36**	.30**	-.20**	-.40**	-.61**	-.43**	-.28**	-.27**	(.85)			
11. Job-related depressive mood t2	1.74	0.74	.16*	-.29**	.16*	-.11	-.24**	-.44**	-.65**	-.25**	-.35**	.55**	(.84)		
12. Sleep problems t1	0.98	0.82	.17*	-.20**	.27**	-.29**	-.16*	-.22**	-.17*	-.15*	-.16*	.31**	.14*	(.71)	
13. Sleep problems t2	1.00	0.84	.10	-.18*	.16*	-.21**	-.16*	-.26**	-.32**	-.07	-.26**	.34**	.65**	.34**	(.76)

*Note.*  $N = 208$ ; For job satisfaction t1, job-related depressive mood t1 and sleep problems t1  $N = 206$ . t1 = time 1; t2 = time 2. Values in parentheses in the diagonal show Cronbach’s  $\alpha$  of the scales.  
\*  $p \leq .05$ . \*\*  $p \leq .01$ .



Table 2  
Coefficients of Well-Being Predictors

Predictors	Predicting job satisfaction t2			Predicting occupational self-efficacy t2			Predicting job-related depressive mood t2			Predicting sleep problems t2		
	Model			Model			Model			Model		
	0	1	2	0	1	2	0	1	2	0	1	2
Outcome variable t1	.66**	.59**	.58**	.60**	.63**	.45	.46**	.47**	.48**	.84**	.78**	.80**
Interruptions t1	-.12	-.09	-.10	<-.01	-.04	-.14	.11	.10	.13	-.09	-.06	-.02
Appreciation by supervisors t1	.08	.08	.28	.09	.08	.76	-.10	-.14	-.59	-.02	-.03	.13
Interruptions t1 × Appreciation by Supervisors t1		.15*	.16**		.23**	.24**		-.13*	-.16*		-.13*	-.14*
Time pressure t1			.02			.10			-.03			-.07
Job control t1			-.10			.07			.01			.02
Social support by supervisors t1			-.18			-.73			.50			-.17

Note. N = 208. t1 = time 1; t2 = time 2. Standardized coefficients are shown.  
\* p ≤ .05. \*\* p ≤ .01 (one-tailed).

2015). Supporting Hypothesis 3, the Work Interruptions × Appreciation by Supervisor interaction was significant for all four outcome variables (Table 2, Model 1); these results did not change when control variables were included (Table 2, Model 2).

Figure 1 plots the interaction effects (Stride, Gardner, Catley, & Thomas, 2015). The interaction patterns reveal that appreciation is a protective resource in the case of all four outcome variables (Figure 1). Simple slope analyses showed that job interruptions had no effect on job satisfaction when appreciation by supervisors was high ( $b = .13, SE = .21, p = .27$ ), whereas the effect was significant ( $b = -.56, SE = .30, p = .03$ ) when appreciation was low. For self-efficacy and job-related depressive mood, the patterns were very similar; the effect of interruptions was significant only when appreciation by supervisors was low (self-efficacy:  $b = -.65, SE = .27, p = .01$ ; depressive mood:  $b = .41, SE = .20, p = .02$ ) but not when it was high (self-efficacy:  $b = .18, SE = .22, p = .21$ ; depressive mood:  $b = -.04, SE = .15, p = .39$ ). For sleep problems, the pattern was similar to that for depressive mood, but none of the simple slopes for interruptions was significant (low appreciation:  $b = .13, SE = .14, p = .18$ ; high appreciation:  $b = -.17, SE = .13, p = .10$ ), implying that only very high levels of appreciation could attenuate the effects of interruptions. Hence, in terms of simple slopes, the buffering effect of appreciation was fully supported for job satisfaction, self-efficacy, and job-related depressive mood, but not for sleep problems.

To ensure that the contribution of appreciation was due to its role as a predictor in its own right, and not due only to its association with social support, we conducted further analyses, controlling for the interaction of interruptions and social support by supervisors. In the first set of additional analyses, we replaced the interaction term “Interruptions × Appreciation” with the interaction term “Interruptions × Social Support” in Model 2. Results revealed significant interaction effects for job satisfaction ( $\beta = .17, p < .05$ ), self-efficacy ( $\beta = .24, p < .01$ ), and job-related depressive mood ( $\beta = -.16, p < .05$ ), but not for sleep problems ( $\beta = -.12, p = .11 ns$ ), suggesting that social support also buffers the negative effect of work interruptions.

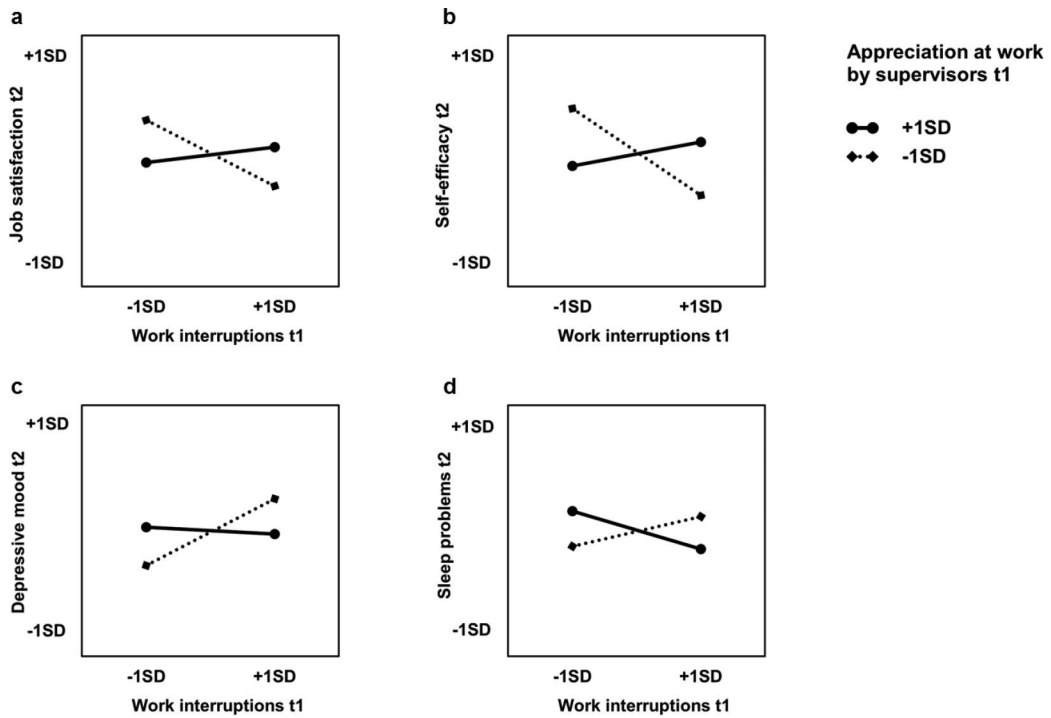


Figure 1. Buffering effects of appreciation by supervisors on the relationship between work interruptions and a) job satisfaction, b) occupational self-efficacy, c) job-related depressive mood, and d) sleep problems. Control variables were included when plotting the interactions. t1 = time 1; t2 = time 2.

In a second set of additional analyses, we tested the independent effects of appreciation and social support more directly. We regressed social support on appreciation at work and used the residuals (social support net of appreciation) as a moderator variable. In these analyses, there was no statistical interaction for any of the outcome variables (job satisfaction:  $\beta = .02$ ,  $p = .42$ ; self-efficacy:  $\beta = .02$ ,  $p = .41$ ; job-related depressive mood:  $\beta = .02$ ,  $p = .38$ ; sleep problems:  $\beta = -.02$ ,  $p = .35$ ). In contrast, after regressing appreciation on social support and entering the residuals, the interaction between interruptions and appreciation net of social support remained significant in three of the four cases (job satisfaction:  $\beta = .13$ ,  $p < .05$ ; self-efficacy:  $\beta = .17$ ,  $p < .05$ ; job-related depressive mood:  $\beta = -.12$ ,  $p < .05$ ), but missed statistical significance for sleep problems ( $\beta = -.09$ ,  $p = .07$ ). Overall, these results support the notion that the buffering effect of appreciation is not due simply to the kinship between

appreciation and social support. Rather, these results indicate that the buffering effects of social support are explained by the buffering effects of appreciation.

Research Questions 1 and 2 asked whether well-being might have a reversed effect on interruptions and on appreciation. No such effect was found - neither in analyses with single predictors nor with all well-being predictors entered simultaneously (the latter are shown in Table 3). Hence, our data reveal no evidence for reversed effects.

## Discussion

This study focused on two rather specific potential predictors of well-being: interruptions as a stressor that has become more and more characteristic of organizational life (Baethge & Rigotti, 2013; Jett & George, 2003), and supervisor appreciation as a resource that is especially suited to affirm the self (Semmer et al.,

Table 3  
*Reversed Effects: Prediction Interruptions and Appreciation by Outcome Variables*

Predictors	Predicting work interruptions t2	Predicting appreciation at work t2
Outcome variable t1	.67**	.99**
Job satisfaction t1	.03	-.19
Occupational self-efficacy t1	.07	-.06
Job-related depressive mood t1	.17	-.11
Sleep problems t1	-.01	.05

*Note.*  $N = 208$ . Standardized coefficients are shown. t1 = time 1; t2 = time 2.

\*  $p \leq .05$ . \*\*  $p \leq .01$  (one-tailed, to ensure comparability with the other analyses).

2016) but has so far mainly been discussed as an element within broader constructs (e.g., effort–reward imbalance: Siegrist, 2005; leadership: Judge et al., 2004; Kuoppala et al., 2008) rather than as a construct in its own right (Stocker et al., 2014). Furthermore, following the logic of the job demands-resources model (Bakker et al., 2005), we postulated an interaction between interruptions and supervisor appreciation. We investigated these effects over time, using a two-wave design.

Results underscore the relevance of research analyzing the interaction of job stressors and job resources longitudinally. Whereas there were no main effects, all four interactions between interruptions and appreciation were significant, and three of them fully conformed to the postulated pattern. The absence of main effects may seem surprising. Neither work interruptions nor appreciation by supervisors seemed strong enough to affect well-being over the observed time period. However, for three of the outcome variables (job satisfaction, self-efficacy, and job-related depressive mood), this lack of an effect held only as long as the relevant other factor was at a reasonably favorable level; but when negative circumstances collided, and employees had to withstand frequent work interruptions *and* a low level of supervisor appreciation, well-being was endangered. These results correspond to the more general finding by Gross et al. (2011) that positive events are especially important under adverse circumstances (Nezlek, Rusanowska, Holas, & Krejtz, 2017), and they are in line with the ability of positive emotions to downregulate negative emotions (undoing effect) postulated by Fredrickson et al. (2000; Tugade & Fredrickson, 2004). The interaction effects held when

control variables were entered, supporting our argument that interruptions are a stressor on their own rather than just a proxy for time pressure and control, and that appreciation is not simply a proxy for social support.

Our analysis using residuals for social support and appreciation from regressing one variable on the other showed that appreciation adjusted for support acted as a buffer, whereas support adjusted for appreciation did not. These results held for all outcome variables except sleep problems, for which the initial results already were weaker than those for the other three outcome variables. Possibly, effects on sleep depend on many more mediating and moderating variables that, for example, characterize the home situation. Overall, however, our results strongly support the impact of appreciation over and above social support at work, as has also been shown by Elfering, Gerhardt, Grebner, and Müller (2017). These results suggest that the positive effects of social support are largely due to its overlap with appreciation. Semmer et al. (2008) have shown that feeling accepted and respected was largely responsible for the perception that instrumental support is supportive. Conversely, some support is deemed unhelpful or unhelpful because it does not convey esteem (e.g., being combined with blame or with premature suggestions for solutions; Semmer, Amstad, & Elfering, 2006), or as being imposed, and thus seems not to take the recipient seriously (Deelstra et al., 2003; Fisher, Nadler, & Whitcher-Alagna, 1982).

Our results have several implications for theory. First, they imply that interruptions have predominantly negative effects, even if these effects are tied to appreciation being low. Under no conditions did positive effects arise from

work interruptions. This does not preclude the possibility that interruptions may sometimes yield positive results. However, positive effects must be much weaker or infrequent than negative ones, and they are likely to be tied to rather special conditions, such as the interruption yielding positive content (e.g., good news or helpful information).

Second, our findings corroborate the relevance of appreciation at work as a resource (Stocker et al., 2014; van Vegchel et al., 2002). Based on the individual's need to maintain a positive self-image (Alicke & Sedikides, 2009; Leary, 1999), SOS theory (Semmer et al., 2007) attributes an especially prominent role to stressors and resources that have implications for the self (Semmer et al., 2015, 2016). Appreciation implies a positive social evaluation, and thus a direct boost to the self. The importance of this self-affirming aspect is supported by the finding that the effect of appreciation consistently prevailed over the effect of social support, which also entails elements of appreciation and esteem (Sarason, Sarason, Brock, & Pierce, 1996), and accordingly was correlated with appreciation quite strongly, but never significantly predicted better well-being when appreciation was in the model. Appreciation therefore should not be investigated solely as part of broader constructs such as social support, or good leadership, but as a construct on its own.

Finally, interruptions may share this aspect of self-relevance with appreciation. Interruptions have implications that go beyond effort and attention; they are likely to make it difficult to reach performance-related goals; reaching such goals, in turn, is related to one's self-image as a competent employee. Thus, a high level of interruptions is likely to threaten one's self-image, rendering interruptions what Thoits (1991) calls an "identity-relevant stressor." From this perspective, appreciation seems to be a resource well-suited to buffering the ill effects of interruptions; both the stressor (interruptions) and the resource (appreciation) are related to the self (albeit in opposite directions) and thus fulfil the "double-match" criterion postulated by triple match theory (de Jonge & Dormann, 2006). At the same time, the third matching criterion (outcome) was not fulfilled, in that the interaction between interruptions pre-

dicted several different facets of well-being (job satisfaction, self-efficacy, and job-related depressive mood) when appreciation was low, suggesting that variables so connected to the self have a rather broad impact on well-being (Tesser, 2001).

### Limitations and Further Research

The main limitation of our research is that all measures are based on self-report, with the attendant risk of common method bias (Podsakoff, MacKenzie, & Podsakoff, 2012). This problem is further aggravated by using single items for assessing supervisor appreciation, supervisor support, and job satisfaction. Note, however, we focus on statistical interactions, which are especially difficult to detect in the presence of common method problems (Podsakoff et al., 2012). Longer questionnaires and more items tax participants' willingness to respond (Reis & Gable, 2000; Rogelberg & Stanton, 2007), and single-item measures have often been found acceptable (Bowling, 2005; Fisher et al., 2016; Postmes, Haslam, & Jans, 2013), with Postmes et al. (2013) concluding that the use of single-item measures is promising if they capture the essence of the construct in question. In addition, to the extent that single-item measures lower reliability, this would weaken the results and increase the difficulty of detecting interactions. More specifically with regard to the measures we used, there is research supporting the efficacy of single-item measures of job satisfaction (Nagy, 2002; Wanous et al., 1997). As for measuring the level of social support from the supervisor, our item is taken from the measure by Frese (1989), following a strategy recommended by Fisher et al. (2016). Finally, the item on appreciation represents an "uncomplicated operationalization" (Postmes et al., 2013, p. 598) of a concept that has intuitive meaning for most people. Furthermore, this item is very similar to the appreciation item successfully used in the study by Bakker, Hakanen, et al. (2007). Overall, we consider it unlikely that our results are seriously distorted by the use of single-item measures, justifying their use in light of the trade-off between psychometric considerations and the need to keep participants motivated. Nevertheless, we cannot exclude the possibility that the limited power associated with single items may have led to

Type II errors, mainly with regard to main effects. Therefore, future research should consider comparing the psychometric properties of a multi-item measure with a single-item measure of appreciation, and outcome variables should more ideally be assessed through means other than self-report (e.g., physiology and spouse reports).

Our two-wave design constitutes a strength. Nevertheless, designs with three and more waves would provide an opportunity to investigate cumulative effects (Baethge et al., 2015; Ford et al., 2014) and thus should be implemented in future research. Furthermore, although our results support conceptualizing interruptions as having predominantly negative effects, under special circumstances, they may have positive effects; future studies might explore such positive aspects (Jett & George, 2003) by focusing on the specific nature of interruptions. For instance, in interview and event-sampling studies, researchers might ask respondents to not only record their affective reactions to interruptions but also describe the nature of the interruptions, to allow some interruptions to be classified as positive. Examples of positive interruptions might include one's supervisor asking for advice or delivering positive feedback, or a welcome interruption to one's work on a boring task. Finally, although leaders have been shown to be especially important for employee well-being and health (Kuoppala et al., 2008), future research might also focus on appreciation by coworkers and customers (Stocker et al., 2014) or on different sources within a supportive network (Nordin, Westerholm, Alfredsson, & Åkerstedt, 2012). We should also mention, however, that our results are based on just one study. We can be reasonably certain that the effects we found represent robust and generalizable findings only when future research can replicate them.

### Practical Implications

Organizations are confronted with the never-ending challenge of developing strategies to manage work interruptions (Jett & George, 2003) to avoid negative long-term consequences (Baethge et al., 2015). Important options for alleviating problems caused by interruptions include reducing interruptions in general, better planning, agreements about com-

munication, providing "protected" times during which interruptions are generally forbidden, and sufficient manpower. Where these options are not possible, or where reducing interruptions endangers positive aspects such as information sharing (Jett & George, 2003), our findings highlight the potential of appreciative behavior by work leaders as a way to buffer the adverse effects of interruptions. Although the underlying processes need more investigation, strengthening employees' self-image by appreciating their contributions seems to support coping with stressful situations that may pose a threat to the self by threatening one's image as a competent and dependable employee. Expressing appreciation is a relatively easy but important tool to help employees handle work stressors. Positive effects of a culture of appreciation have been shown by a program called Civility, Respect, Engagement in the Workforce (Leiter, Day, Oore, & Spence Laschinger, 2012; Osatuke, Moore, Ward, Dyrenforth, & Belton, 2009). Appreciation can be shown in many ways, most obviously through praise and expressions of gratitude, but other ways include signaling trust, honoring competency, listening carefully, respecting individual needs, assigning interesting tasks, and the like (Stocker et al., 2014). Hence, appreciation in the workplace is more than a matter of using conspicuous tools like Employee of the Month programs. Rather, it requires paying attention and expressing simple messages about things that often go without saying in everyday life.

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