The effect of positive work reflection during leisure time on affective well-being: Results from three diary studies

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Summary   Previous research showed that psychological detachment from work during leisure time is beneficial and that reflecting on negative aspects of work is detrimental for employees' well-being. However, little is known about the role of positive reflection about work during leisure time. In the present research, we examined the effects of positive work reflection on affective well-being. Additionally, we tested the effectiveness of an intervention to increase positive work reflection and to improve well-being with a randomized controlled field experiment. Findings from three diary studies showed that positive work reflection was related to an increase in affective well-being with regard to both positive and negative moods. The results further indicated that the benefits of positive work reflection were incremental to that of psychological detachment and the absence of negative work reflection. Contrary to our expectation, no evidence was found for the effectiveness of the intervention. Theoretical implications of main findings as well as supplementary findings are further discussed. Copyright © 2015 John Wiley & Sons, Ltd.

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For many employees, work is not over when they leave the workplace in the evening. Instead, they keep thinking about work-related events at home, not only while they are finishing some work but also while watching television or spending time with family members. According to a recent report, about one out of every two employees either engages in work-related activities or reflects about work during their off time (American Psychological Association, 2013). Given the high prevalence of work reflection during leisure time, it is important to understand how work-related thoughts affect employee well-being. Cumulative evidence indicates that lack of psychological detachment from work has a negative impact on employees' well-being (e.g., Sonnentag, 2012a). Taken together, research to date suggests that reflecting about work during leisure time is common but thinking about work during off time might be detrimental for employee well-being.

Several studies have further explored the role of work-related thoughts in employee health by investigating the valence of work-related thoughts. Considering the valence of thoughts is important because the impact of positive and negative work reflections on well-being is likely to differ. On the one hand, cross-sectional studies (e.g., Berset, Elfering, Lüthy, Lüthi, & Semmer, 2011; Querstret & Cropley, 2012) and diary studies (e.g., Cropley, Rydstedt, Devereux, & Middleton, 2015; Wang et al., 2013) have consistently demonstrated that negative work reflection is harmful for well-being. On the other hand, only a handful of studies have investigated positive work reflection (e.g., Daniel & Sonnentag, 2014; Fritz & Sonnentag, 2005, 2006), although scholars noted that positive work reflection is likely to have beneficial effects (e.g., Sonnentag & Fritz, 2015). Furthermore, findings from previous studies have been mixed, and most of the studies have focused on between-individual differences using cross-sectional or longitudinal designs. As an exception, Sonnentag and Grant (2012) examined whether daily fluctuations of positive

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work reflection are related to fluctuations of positive mood. This study demonstrated intriguing results such that positive work reflection increased only certain types of positive affect (e.g., enthusiasm and joviality), highlighting the need to study further the different aspects of positive affect. In sum, more research about the impact of positive work reflection on well-being is warranted.

The goal of the present research is to examine the effect of positive work reflection during leisure time on well-being. We focused on affective well-being because affective experiences serve as key mechanisms by which the work and nonwork domains are linked (Greenhaus & Powell, 2006) and have implications for various work behaviors (Grandey, 2008). Furthermore, we sought to examine the effectiveness of an intervention that facilitates well-being via promoting positive work reflection during leisure time given the potential benefit of positive work reflection.

Our research makes four key contributions to the literature. First, we advance the knowledge on the impact of positive work reflection during leisure time on well-being by conducting a series of diary study, focusing on intraindividual variations of work reflection and well-being. Various scholars have argued that most psychological processes and mechanisms reflect intraindividual fluctuations of states (e.g., cognition and affect) rather than interindividual differences in chronic conditions or traits (e.g., Curran & Bauer, 2011; Dalal, Bhave, & Fiset, 2014; Hamaker, 2012). Furthermore, daily diary approach links different states closely in time because of relatively shorter time intervals that it adopts (e.g., a few hours to a day), which helps to show the unfolding of a temporal process (Bolger & Laurenceau, 2013). Such an examination of the microprocesses related to positive work reflection complements prior studies that have focused on interindividual differences in positive work reflection (e.g., Daniel & Sonnentag, 2014; Fritz & Sonnentag, 2005, 2006), thereby providing us with a more holistic picture of the relationship between positive work reflection and well-being. Second, the current study extends our understanding on the potential consequences of positive work reflections by examining a wider range of affective experiences than did previous studies. Previous studies on affective outcomes of positive work reflection have mainly focused on positive affect (Daniel & Sonnentag, 2014; Sonnentag & Grant, 2012), although research suggests that affective experiences represent an integral blend of two primary attributes (e.g., Russell, 2003; Warr, Bindl, Parker, & Inceoglu, 2014), namely pleasure and arousal. Pleasure reflects affective valence and differentiates positive and negative affects; arousal concerns the degree of readiness for action or energy expenditure and differentiates low-activation and high-activation affects. In the present study, we consider affective experiences that encompass the four quadrants: serenity as low-activation positive affect, joviality as high-activation positive affect, depressive mode as low-activation negative affect, and anger as high-activation negative affect. Third, we address the call to study the temporal dynamics in organizational research (e.g., Sonnentag, 2012b) by examining the duration of the effect with various time lags. Specifically, we test whether positive work reflection during leisure time impacts well-being in the evening of the same day as well as the next morning. Finally, we examine the effectiveness of an intervention to promote positive work reflection during leisure time by conducting a randomized controlled experiment, which helps elucidate the effect of interventions (Goldenhar, LaMontagne, Katz, Heaney, & Landsbergis, 2001). Furthermore, our study on the positive work reflection intervention expands the extant literature given that the majority of previous intervention research in the field of occupational health has focused on job stressors and strain (e.g., stress intervention programs; Semmer, 2011).

Positive Work Reflection and Affective Well-Being

Positive work reflection refers to thinking about the positive aspects of one's job and may include thoughts about pleasurable events such as successful task accomplishment and supportive work relationships. A number of theories substantiate the benefits of positive work reflection on well-being. Recalling positive events triggers positive emotions (Morris, 1989) and prolongs and amplifies positive consequences of the event (i.e., savoring; Bryant, 1989). Positive emotions are also known to accelerate recovery from negative emotional arousal (Fredrickson &

Levenson, 1998; Fredrickson, Mancuso, Branigan, & Tugade, 2000), suggesting that positive work reflection may result in less negative affect. In line with this, reflecting on positive aspects of one's job may act as a form of reappraisal of a possibly stressful work situation, which should lead to a reduction in stress (Lazarus, 1991). In sum, positive work reflection can be regarded as a recovery process (Fritz & Sonnentag, 2006) that generates psychological and affective personal resources (Ten Brummelhuis & Bakker, 2012).

Some longitudinal investigations have tested the role of positive work reflection in employee well-being, yielding somewhat inconsistent results. Fritz and Sonnentag (2005) showed that positive work reflection during the weekend predicted lower exhaustion and disengagement the following week. In a study about vacations experiences, positive work reflection during vacations resulted in short-term benefit on disengagement, but had no effect on health complaints and exhaustion (Fritz & Sonnentag, 2006). In a longitudinal study with a time lag of three months, Daniel and Sonnentag (2014) found prospective effect of positive work reflection on work–family enrichment. Moreover, positive work reflection was cross-sectionally related to positive affect; however, it did not predict change in positive affect over time (S. Daniel, 2014, personal communication, 17 June 2014). Thus, previous research focusing on between-person differences seems to suggest that positive work reflection is potentially beneficial for well-being although the effect might not be long-lasting. The transient nature of work reflection and affective experiences also points that studying daily within-person fluctuation might better capture the effect of positive work reflection. Indeed, a positive relationship of positive work reflection with high-activation positive affect at bedtime was reported in a diary study (i.e., enthusiasm and joviality; Sonnentag & Grant, 2012).

The review of the extant literature on positive reflection points out two important considerations. First, previous research focused mainly on positive affect despite theoretical arguments that reflecting on positive aspects of one's job not only increases positive affect (Lazarus, 1991; Morris, 1989) but also decreases negative affect (Fredrickson et al., 2000). Lack of studies that consider both positive and negative affects is a critical gap in the literature because the recovery process entails not only increased positive states but also decreased negative states (Geurts & Sonnentag, 2006). Second, previous literature has ignored an in-depth investigation of the role of arousal while studying positive affective experiences although recent findings suggest that antecedents and outcomes of low-activation versus high-activation affects might differ (e.g., Sonnentag & Grant, 2012; Warr et al., 2014). To address these limitations, we examine negative as well as positive affects in both low and high activations. Noteworthy, some scholars have argued that processes responsible for positive and negative affects are independent of each other, suggesting that positive events (or reflections) are related only to positive affect but not negative affect (e.g., Carver, Sutton, & Scheier, 2000; Gable, Reis, & Elliot, 2003). Empirical findings, however, have been inconclusive; some studies have shown that everyday positive events were only related to positive affect (e.g., Gable, Reis, & Elliot, 2000), whereas others reported beneficial effects of positive events on negative affect (e.g., Nezlek & Plesko, 2003) and stress outcomes (Bono, Glomb, Shen, Kim, & Koch, 2013). By examining both positive and negative affects as potential outcomes of positive work reflection, our research may help inform the theory about the source of affective well-being.

Based on the theoretical reasoning and existing empirical evidence, we propose the following hypothesis:

Hypothesis 1: Within individuals, positive work reflection positively relates to serenity and joviality and negatively relates to depressive mood and anger, both at bedtime and in the next morning.

Intervention to promote positive work reflection

Previous interventions to enhance employee well-being have been largely based on the stress perspective. That is, prior scholastic endeavors have aimed to eliminate or reduce job stressors (e.g., Israel, Baker, Goldenhar, Heaney, & Schurman, 1996) or to minimize strain (e.g., Van der Doef & Maes, 1999). This is a critical gap in the literature because employee well-being reflects not just the absence of negative experiences but also the presence of positive

experiences (Cameron, Dutton, & Quinn, 2003). Therefore, further research on interventions that promote positive feelings, behaviors, or thoughts is necessary to advance our knowledge on how to enhance employee well-being.

Several intervention techniques introduced in the positive psychology literature have beneficially influenced well-being (e.g., meditating and mindfulness; for an overview, see Sin & Lyubomirsky, 2009). Of particular interest for the present study, Seligman and colleagues showed that individuals who were asked to write about three good things that happened during the day reported improved well-being (e.g., Seligman, Rashid, & Parks, 2006; Seligman, Steen, Park, & Peterson, 2005). The three-good-things intervention is thought to help individuals fight against the tendency to ruminate negative events. Although both positive and negative events happen in daily life, people tend to think more about negative events than positive ones (e.g., Abele, 1985; Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001). To intentionally think of positive events, for example, by writing about them, might be an effective way to counteract this asymmetry. Also, guided reflecting and writing about positive events were proposed to make the events more accessible in memory, which facilitates savoring and capitalization (Bryant, 1989; Gable, Reis, Impett, & Asher, 2004). Lastly, recalling positive events leads to increased positive affect (Morris, 1989). In sum, guided reflecting and writing about positive events are expected to trigger positive cognitions and emotions, thereby improving individual well-being.

Benefits of these interventions on well-being, however, have rarely been examined in the work context. Most studies on guided reflection (i.e., reflection that is triggered by an intervention such as the instruction to think and write about an event) about positive work events have investigated learning and performance improvement as outcomes, finding that guided reflection is an effective tool that facilitates learning from experiences (Ellis, Carette, Anseel, & Lievens, 2014). As an exception, Bono and colleagues (2013) tested the effectiveness of the three-good-things intervention using a within-person design. Participants reported better psychological well-being (less stress, fewer health complains, and more psychological detachment) on days that they wrote about three good things that happened that day compared with days without writing. In another study, teachers reported three things they were grateful for each week for two months (Chan, 2010). After the intervention, participants reported higher life satisfaction and more positive affect although no change was observed in negative affect. It is important to note that no control condition existed in Chan's study.

Our study extends the previous research on guided reflection interventions in two important ways. First, we examine the effect of writing about three positive things that are related to work. In both studies (Bono et al., 2013; Chan, 2010), participants were asked to report about positive or grateful things in general, which did not have to be related to work. By focusing on positive work events, we aim to elucidate the salutary effect of positive work reflection. Second, to reduce demand characteristics that are associated with a within-person design (Withley & Kite, 2013), we used a between-person design in which one group of participants wrote about three good things (intervention condition), while another group did not (control condition).

Based on the theoretical reasoning and evidence from the previous studies, we postulate the following hypothesis:

Hypothesis 2: Compared with participants in the control condition, participants in the intervention condition report (a) more positive work reflection during leisure time and (b) better well-being (higher serenity, higher joviality, lower depressive mood, and lower anger) at bedtime and in the next morning.

Present Research

The present research consists of three diary studies, focusing on within-person variabilities in work reflection and affective well-being. In all three studies, we examined the impact of positive work reflection on affective well-being in the evening of the same day as well as in the morning of the next day (Hypothesis 1).[1] In Study 1, we focused only

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[1]High-activation positive affect (joviality) was measured only in Studies 2 and 3.

on positive work reflections. In Studies 2 and 3, we also included negative work reflection, psychological detachment, and neuroticism to rule out alternative explanations and to examine whether the effect of positive work reflection provides incremental prediction over and above the well-established predictors of affective well-being. In Study 3, we tested the effectiveness of an intervention that facilitates well-being via promoting positive work reflection during leisure time (Hypothesis 2).

Study 1

Method

Participants and procedure

Using student-recruiting sampling, employees from several Swiss organizations who work in a variety of jobs (e.g., sales person, commercial agent, secretary, consultant, controller, lawyer, nurse, physician, social worker, engineer, and software developer) were recruited. The employees were asked to participate in a diary study about organizational well-being. Participants had to work at least 50 percent of a full-time equivalent (about 21 hours per week). As compensation, the participants received individual feedback about their work situation and well-being at the end of the study.

The sample consisted of 131 employees. Their ages ranged from 16 to 62 years ($M = 33.4$, $SD = 12.6$). The majority of participants were female (64 percent); 13 percent had completed regular school (nine years) or an apprenticeship, 61 percent had completed college, and 26 percent had a masters degree. On average, they worked 36.1 hours per week ($SD = 7.1$), and organizational tenure ranged from 0.1 to 30 years ($M = 3.2$; $SD = 5.9$).

Participants first completed a one-time questionnaire to assess demographic variables. At the beginning of the following week (Monday), participants began completing two to three paper-and-pencil surveys per day for two weeks (including weekends). On a working day, participants filled in a morning survey (before they started working), an end-of-work survey, and a bedtime survey. On a nonworking day, participants filled in a morning and a bedtime survey only. Overall, participants completed 1811 morning surveys, 1092 end-of-work surveys, and 1791 bedtime surveys, corresponding to a response rate of 99 percent for the morning surveys and 98 percent for the bedtime surveys. Because the end-of-work survey had to be taken only on workdays and not all participants worked full-time, calculating an accurate response rate for the end-of-work survey was not possible. However, participants had to indicate whether it was a workday in the morning survey, and based on this information, the response rate for the end-of-work survey was 95 percent. Furthermore, participants indicated if a survey had been filled out with a delay of more than 15 minutes from the prescribed time point. For the subsequent analyses, we used only the surveys that had been filled out on time (1702 morning surveys, 988 end-of-work surveys, and 1683 bedtime surveys, corresponding to an average of 13.0 ($SD = 1.6$) morning surveys, 7.5 ($SD = 2.3$) end-of-work surveys, and 12.8 ($SD = 1.7$) bedtime surveys per person).

Measures

Positive work reflection. At bedtime, positive work reflection during leisure time was assessed with a four-item scale from Binnewies, Sonnentag, and Mojza (2009), which is based on the work of Fritz and Sonnentag (2005, 2006). An example is 'Today after work, I thought about the good sides of my work'. The response format ranged from *completely disagree* (1) to *completely agree* (5).

Serenity. At all three measurement occasions per day, serenity was assessed with a scale from Abele-Brehm and Brehm (1986) (see also Sonnentag & Grant, 2012). Participants had to indicate how they felt at the moment, using four items (calm, relaxed, laid-back, and placid). The response format ranged from *not at all* (1) to *very much* (5).

Depressive mood. At all three measurement occasions per day, depressive mood was assessed with a shortened version of the Profile of Mood States (McNair, Lorr, & Droppleman, 1992). Participants had to indicate how they felt at the moment. Following Cranford et al. (2006), we used three items (sad, hopeless, and discouraged). The response format ranged from *not at all* (1) to *very much* (5).

Angry mood. At all three measurement occasions per day, angry mood was assessed with a shortened version of the Profile of Mood States (McNair et al., 1992). Participants had to indicate how they felt at the moment. Following Cranford et al. (2006), we used three items (angry, resentful, and annoyed). The response format ranged from *not at all* (1) to *very much* (5).

Results and discussion

Data were analyzed with a multilevel random coefficient model, using the program HLM 6.06 (Raudenbush, Bryk, Cheong, & Congdon, 2004). The main focus of the analyses was on the within-person relationship of positive work reflection during leisure time with well-being at bedtime and the next morning. To model change in the outcome (i.e., well-being) and to rule out that the effect of positive work reflection can be explained by the affective tone of the workday, we controlled for well-being at the end of work. These predictors were group mean-centered, implying that the coefficients for these variables reflect the effect of a person being high or low (e.g., many or few positive reflection) relative to his or her own mean for that variable across days. Thus, between-person variance in these variables was removed, and an interpretation of the results in terms of stable differences between persons can be ruled out (Ilies, Schwind, & Heller, 2007). Average level of positive work reflection is neglected by group-mean centering. To take into account the effect of the average level of positive work reflection on well-being, we additionally used the aggregated daily measures of positive work reflection as a between-person variable, which was grand mean-centered. To obtain correct estimates of the within-person and the between-person relationships, we created separate within-person and between-person versions of our predictor, following the steps outlined by Bolger and Laurenceau (2013). Because relationships on the between-person level are not the main focus of the present study, we will briefly discuss findings that are related to the effect of average level of positive work reflection at the end of the Results and discussion section. We also included 'day of study' in the model to control for time trends in the data (e.g., Beal & Weiss, 2003; Bolger & Laurenceau, 2013). We used the restricted maximum-likelihood procedure in HLM for estimating the fixed and random parameters, and because of the non-normal distribution of the outcome variables, we used the robust standard errors for the significance tests (Hox, 2010).

Means, standard deviations, intraclass correlations, and zero-order correlations for the daily measures are shown in Table 1. Table 2 presents results from the multilevel analyses. Results generally supported Hypothesis 1. Within person, positive work reflection during leisure time predicted serenity and depressive mood at bedtime and depressive mood in the next morning. The effects on angry mood were in the predicted direction but marginally significant. In sum, daily positive work reflection was found to be beneficial for well-being.

A limitation of Study 1 is that only positive work reflection was examined; hence, the effect of negative work reflection was not accounted for. Previous research that measured both positive and negative work reflections reported a positive correlation between the two variables (Binnewies et al., 2009; Fritz & Sonnentag, 2006). This suggests that between-person differences may exist with regard to a general tendency to either think about positive as well as negative aspects of the job during the leisure time or not to think about work. However, on the within-person level, a negative association between positive and negative work reflections is reasonable to assume such that positive work reflection triggers positive emotions, which block the accessibility of negative thoughts about work. The only existing study on within-person fluctuations of positive work reflection did not measure negative work reflection (Sonnentag & Grant, 2012), providing little information about associations between positive and negative work reflections. Importantly, by not controlling for negative work reflection, we cannot rule out a possibility that the benefit of positive work reflection merely reflects the absence of negative work reflection.

Table 1. Sample sizes, means, standard deviations, and correlations of the measures (Study 1).

Variables	N	M	SD_{b-p}	SD_{w-p}	ICC	1	2a	2b	2c	3a	3b	3c	4a	4b	4c
1. Positive work reflection	1602	1.71	0.67	0.80	.42	(.94)	.01	.10*	.09*	.00	−.07*	−.06*	.04	−.05*	−.06*
2. Serenity															
a. Morning	1702	3.27	0.76	0.71	.53	.13	(.92)	−.20*	.19*	−.32*	−.07*	−.09*	−.30*	.04	−.08*
b. End of work	987	3.10	0.77	0.69	.53	.19*	.85*	(.91)	.25*	−.01	−.26*	−.11*	.00	−.30*	−.09*
c. Bedtime	1681	3.19	0.79	0.75	.53	.16	.85*	.85*	(.92)	−.06*	−.14*	−.26*	−.07*	.09*	−.28*
3. Depressive mood															
a. Morning	1702	1.11	0.19	0.27	.32	.14	−.31*	−.20*	−.18*	(.77)	.09*	.12*	.38*	.04	.00
b. End of work	987	1.13	0.20	0.30	.30	.12	−.28*	−.20*	−.14	.48*	(.77)	.26*	.06	.38*	.28*
c. Bedtime	1682	1.16	0.22	0.44	.23	.14	−.26*	−.18*	−.24*	.82*	.81*	(.82)	.00	.08*	.45*
4. Angry mood															
a. Morning	1702	1.07	0.10	0.28	.10	.20*	−.16	−.08	−.10	.53*	.48*	.46*	(.84)	.05	.11*
b. End of work	987	1.14	0.12	0.41	.08	.03	−.18*	−.18*	−.05	.39*	.50*	.32*	.52*	(.89)	.27*
c. Bedtime	1682	1.10	0.12	0.27	.11	.17*	−.18*	−.15	−.23*	.57*	.43*	.60*	.60*	.51*	(.90)

Note: SD and ICC are based on variance estimates of unconditional (null) models. Correlations above the diagonal reflect the within-person associations of the constructs. Correlations below the diagonal reflect the between-person associations of the aggregated measures. Reliability estimates (ω, calculated according to Shrout and Lane, 2012) are shown in parentheses in the diagonal of the table.

SD_{b-p} = between-person standard deviation; SD_{w-p} = within-person standard deviation; ICC = intraclass correlation (proportion of the between-person variance compared with the total variance).

*p < .05. Two-tailed tests.

Table 2. Multilevel analyses predicting well-being at bedtime and in the next morning (Study 1).

| | Serenity | | | | Depressive mood | | | | Angry mood | | | |
| | Bedtime | | Next morning | | Bedtime | | Next morning | | Bedtime | | Next morning | |
	B	T	B	T	B	T	B	T	B	T	B	T
Intercept	3.26*	43.81	3.18*	39.08	1.16*	34.11	1.14*	37.52	1.12*	46.79	1.08*	59.20
Between-person effect												
Positive thoughts	0.21*	2.44	0.18†	1.77	0.07*	2.27	0.04	1.26	0.06*	2.42	0.02	1.24
Within-person effects												
Day	−0.02*	−2.39	0.01*	2.02	<0.01	0.03	−0.01†	−1.88	<0.01	0.21	<0.01	−1.15
DV at the end of work	0.23*	6.01	0.17*	4.38	0.23*	3.02	0.10*	2.18	0.20*	3.63	0.07	1.53
Positive thoughts	0.06*	2.13	0.04	1.42	−0.04*	−2.56	−0.04*	−3.53	−0.03†	−1.94	−0.02†	−1.69

Note: DV = dependent variable.
*$p < .05$; †$p < .10$. Two-tailed tests.

Study 2

Study 2 was conducted to cross-validate and extend Study 1. The main objective of Study 2 was to address the limitation of Study 1, by simultaneously investigating positive and negative work reflections. We also controlled for psychological detachment to examine whether positive work reflections have a positive effect on well-being that goes over and above the well-established recovery effect of psychological detachment (Sonnentag & Fritz, 2015). Moreover, we included neuroticism as a person-level control variable. A number of researchers have discussed that negative affectivity and neuroticism affect the experience and/or measurement of stressors and well-being, which might yield biased estimates of their association (e.g., Watson, Pennebaker, & Folger, 1987). Given the possibility that negative affectivity/neuroticism affects the frequency and/or measurement of work reflection, we included neuroticism in the analyses of the effects of the average level of positive work reflection on well-being. Although controlling for neuroticism does not affect the within-person results because the day-specific predictors were group mean-centered (see previous discussion), it may affect the between-person effects. We also extended our outcome measures by including joviality to assess all four quadrants of affective well-being.

Method

Participants and procedure
Participants were recruited via sending advertising emails to a university-wide listserv of a large university in the USA and posting flyers around the community. To be eligible, participants had to be 18 years or older and working full-time (at least 40 hours per week). As compensation, participants received an $80 gift card after completion of the study.

Among 89 individuals who filled in a one-time questionnaire, three did not participate in the diary study and were removed from the sample. Thus, the final sample consisted of 86 employees. Their ages ranged from 22 to 70 years ($M = 42.1$, $SD = 12.7$). The majority of participants were female (84 percent); 9 percent had completed high school or vocational school, 24 percent had some college experience, 48 percent had a college degree, and 17 percent had a masters degree. Most of the participants worked as office and administrative support (28 percent), in the domain of education, training, or library (22 percent), in sales (9 percent), or management (8 percent). On average, they worked 41.9 hours per week ($SD = 3.8$), and organizational tenure ranged from 0.1 to 30 years ($M = 7.3$; $SD = 6.7$).

Data were collected using online questionnaires. Participants first completed a one-time questionnaire to assess demographic variables and neuroticism. At the beginning of the following week (Monday), participants began completing three surveys per day (excluding weekends). Participants filled in a morning survey (before they started working), an end-of-work survey (before they left the workplace), and a bedtime survey. Invitation and reminder emails were sent for each survey at the times that were chosen by the participants to best match their work and bedtime hours. Participants were asked to continue taking the daily survey until they completed the study (defined as having 10 days of data with at least two surveys filled in). The surveys had to be filled in within a time frame of 90 minutes. Eighty-three participants (97 percent) completed the study, but data from all 86 participants were included in the analyses. On average, participants filled in 28.1 surveys ($SD = 1.9$) and finished the study within 11.3 days ($SD = 2.2$). Overall, participants completed 819 morning surveys (91 percent response rate), 814 end-of-work surveys (90 percent response rate), and 780 bedtime surveys (87 percent response rate), corresponding to an average of 9.5 ($SD = 1.1$) morning surveys, 9.5 ($SD = 0.9$) end-of-work surveys, and 9.1 ($SD = 1.5$) bedtime surveys per person.

Measures
Positive work reflection. At bedtime, positive work reflection during leisure time was assessed with the same four-item scale as in Study 1. The response format ranged from *completely disagree* (1) to *completely agree* (5).

Table 3. Sample sizes, means, standard deviations, and correlations of the measures (Study 2).

Variables	N	M	$SD_{b\text{-}p}$	$SD_{w\text{-}p}$	ICC	1	2	3	4a	4b
1. Positive work reflection	780	2.84	0.59	0.73	.40	(.93)	.47*	−.07	−.01	.09*
2. Negative work reflection	780	2.78	0.53	0.79	.31	.28*	(.94)	−.23*	−.07	.00
3. Psychological detachment	780	3.40	0.58	0.77	.36	.10	−.36*	(.88)	.02	.04
4. Serenity										
a. Morning	819	2.48	0.81	0.56	.68	.20	−.30*	.19	(.71)	.25*
b. End of work	814	2.36	0.79	0.54	.59	.24*	−.27*	.20*	.90*	(.65)
c. Bedtime	780	2.61	0.70	0.58	.59	.15	−.28*	.21	.86*	.89*
5. Joviality										
a. Morning	819	2.15	0.87	0.51	.75	.34*	−.19	.23*	.83*	.82*
b. End of work	814	2.21	0.83	0.59	.66	.32*	−.24*	.23*	.82*	.89*
c. Bedtime	780	2.16	0.80	0.54	.69	.30*	−.20	.30*	.76*	.80*
6. Depressive mood										
a. Morning	819	1.27	0.39	0.36	.54	−.37*	.32*	−.28*	−.36*	−.34*
b. End of work	814	1.28	0.37	0.40	.47	−.34*	.36*	−.29*	−.34*	−.38*
c. Bedtime	780	1.27	0.37	0.36	.51	−.38*	.30*	−.28*	−.29*	−.29*
7. Angry mood										
a. Morning	819	1.27	0.39	0.38	.51	−.37*	.31*	−.29*	−.31*	−.26*
b. End of work	814	1.32	0.38	0.46	.42	−.39*	.35*	−.33*	−.33*	−.40*
c. Bedtime	780	1.25	0.34	0.42	.40	−.34*	.33*	−.31*	−.29*	−.28*
8. Neuroticism	86	2.72	0.61	—	—	−.21	.28*	−.04	−.46*	−.48*

Notes: SD and ICC are based on variance estimates of unconditional (null) models. Correlations above the diagonal reflect the within-person associations of the constructs. Correlations below the diagonal reflect the between-person associations of the aggregated measures. Reliability estimates (ω, calculated according to Shrout and Lane, 2012) are shown in parentheses in the diagonal of the table.
$SD_{\text{b-p}}$ = between-person standard deviation; $SD_{\text{w-p}}$ = within-person standard deviation; ICC = intraclass correlation (proportion of the between-person variance compared with the total variance).
*p < .05. Two-tailed tests.

Negative work reflection. At bedtime, negative work reflection during leisure time was assessed with a four-item scale based on the work of Fritz and Sonnentag (2005, 2006). An example is 'Today after work, I thought about the negative sides of my work.' The response format ranged from *completely disagree* (1) to *completely agree* (5).

Psychological detachment. At bedtime, psychological detachment during leisure time was assessed with a four-item scale of Sonnentag and Fritz (2007). An item example is 'Today after work, I distanced myself from my work.' The response format ranged from *completely disagree* (1) to *completely agree* (5).

Joviality. At all three measurement occasions per day, joviality was assessed with a shortened version of the Positive Affect and Negative Affect Schedule-Expanded Form (Watson & Clark, 1994). Participants had to indicate how they felt at the moment, using three items (joyful, happy, and delighted). The response format ranged from *not at all* (1) to *extremely* (5).

Serenity. At all three measurement occasions per day, serenity was assessed with a scale from Warr (1990). Participants had to indicate how they felt at the moment, using three items (calm, relaxed, and contented). The response format ranged from *not at all* (1) to *extremely* (5).

Depressive and angry mood. At all three measurement occasions per day, depressive and angry moods were assessed with the same three-item scales as in Study 1. The response format ranged from *not at all* (1) to *extremely* (5).

Table 3. (Continued)

Variables	4c	5a	5b	5c	6a	6b	6c	7a	7b	7c	8
1. Positive work reflection	.04	−.01	.03	.07*	.00	−.07	−.13*	.02	−.10*	−.15*	—
2. Negative work reflection	−.14*	−.06	−.08*	−.07*	.06	.12*	.18*	.03	.14*	.28*	—
3. Psychological detachment	.17*	.03	.06	.16*	−.04	−.10*	−.24*	−.08*	−.13*	−.23*	—
4. Serenity											
a. Morning	.16*	.60*	.24*	.11*	−.19*	−.07	−.03	−.24*	−.07	−.01	—
b. End of work	.22*	.18*	.57*	.24*	−.06	−.27*	−.11*	−.04	−.29*	−.13*	—
c. Bedtime	(.68)	.15*	.25*	.55*	−.11*	−.13*	−.24*	−.08*	−.14*	−.37*	—
5. Joviality											
a. Morning	.71*	(.75)	.31*	.17*	−.23*	−.08*	−.03	−.23*	−.04	−.04	—
b. End of work	.79*	.94*	(.79)	.31*	−.11*	−.30*	−.15*	−.06	−.31*	−.17*	—
c. Bedtime	.81*	.86*	.91*	(.71)	−.03	−.09*	−.24*	−.03	−.18*	−.28*	—
6. Depressive mood											
a. Morning	−.36*	−.37*	−.34*	−.30*	(.70)	.25*	.17*	.56*	.13*	.06	—
b. End of work	−.36*	−.31*	−.35*	−.30*	.91*	(.66)	.36*	.17*	.59*	.31*	—
c. Bedtime	−.33*	−.26*	−.27*	−.25*	.92*	.92*	(.59)	.09*	.31*	.64*	—
7. Angry mood											
a. Morning	−.28*	−.34*	−.28*	−.27*	.91*	.80*	.84*	(.71)	.12*	.07	—
b. End of work	−.34*	−.34*	−.37*	−.31*	.79*	.89*	.82*	.80*	(.73)	.35*	—
c. Bedtime	−.30*	−.24*	−.24*	−.23*	.84*	.79*	.88*	.90*	.83*	(.74)	—
8. Neuroticism	−.42*	−.41*	−.45*	−.34*	.47*	.48*	.41*	.43*	.46*	.44*	(.78)

Neuroticism. In the one-time questionnaire, neuroticism was assessed with the eight-item scale of the Big Five Inventory from John, Donahue, and Kentle (1991). An example is 'I see myself as someone who worries a lot.' The response format ranged from *strongly disagree* (1) to *strongly agree* (5).

Confirmatory factor analysis. To examine whether positive work reflection, negative work reflection, and psychological detachment are distinct constructs, we conducted multilevel confirmatory analyses using the program MPLUS 7 (Muthén & Muthén, 2012). Results supported that the three measures reflect different constructs in that a three-factor model fitted well ($\chi^2(105) = 422.07$, comparative fix index = 0.96, Tucker–Lewis index = 0.95, root mean square error of approximation = 0.06, standardized root mean residual (SRMR) $SRMR_{within} = 0.05$, $SRMR_{between} = 0.07$), whereas all two-factor models and the one-factor model did not fit the data adequately. Detailed results of the various models can be obtained from the first author.

Results and discussion

We used the same statistical procedure to analyze the data as in Study 1. Means, standard deviations, intraclass correlations, and zero-order correlations are shown in Table 3. Within person, positive and negative work reflections were positively correlated. Positive work reflection was unrelated to psychological detachment, whereas negative work reflection was negatively related to psychological detachment. Table 4 presents results from the multilevel analyses. Within person, positive work reflection predicted serenity, depressive mood, and angry mood at bedtime, but it was unrelated to joviality. There were no lagged effects on well-being in the following morning. The same result pattern was found for negative work reflection (with reversed signs) and psychological detachment.

In sum, the results supported Hypothesis 1, showing that positive work reflection had a beneficial effect on well-being. Importantly, these findings were consistent with the findings from Study 1 for the most part. Furthermore,

Table 4. Multilevel analyses predicting well-being at bedtime and in the next morning (Study 2).

| | Serenity | | | | Joviality | | | |
| | Bedtime | | Next morning | | Bedtime | | Next morning | |
	B	*T*	*B*	*T*	*B*	*T*	*B*	*T*
Intercept	2.68*	37.37	2.49*	27.98	2.15*	24.51	2.16*	22.88
Between-person effects								
Neuroticism	−0.41*	−2.69	−0.51*	−3.43	−0.35[†]	−1.90	−0.49	−2.81
Psychological detachment	0.13	1.20	0.11	0.88	0.27[†]	1.85	0.21	1.23
Negative work reflection	−0.20	−1.55	−0.29[†]	−1.92	−0.18	−1.16	−0.21	−1.25
Positive work reflection	0.11	1.07	0.25*	2.19	0.34*	3.15	0.41*	3.26
Within-person effects								
Day	−0.02*	−2.37	−0.01	−0.97	<0.01	0.05	−0.01	−0.93
DV at the end of work	0.21*	4.36	0.05	1.10	0.27*	6.41	0.13*	2.85
Psychological detachment	0.09*	2.77	0.01	0.38	0.08*	2.96	0.03	1.06
Negative work reflection	−0.08*	−2.29	<0.01	0.10	−0.03	−0.90	−0.02	−0.50
Positive work reflection	0.09*	2.05	0.01	0.25	0.07	1.59	0.04	1.04

Note: DV = dependent variable.
*$p < .05$; †$p < .10$. Two-tailed tests.

extending Study 1, we showed that the effect of positive work reflection explained changes in well-being over and above the effects of negative work reflection and psychological detachment.

Study 3

The main objective of Study 3 was to test the effectiveness of an intervention that is designed to increase positive work reflection. To this end, we conducted a randomized controlled experiment. Also, we provide a replication of Study 2 by including the same constructs.

Method

Participants and procedure

Employees in a large university in the USA were recruited through the same procedure in Study 2. Participants had to be 18 years or older and work full-time (at least 40 hours per week). Eighty individuals filled in the one-time questionnaire; however, six of them did not participate in the diary study and were dropped from the sample. Thus, the final sample consisted of 74 employees. Their ages ranged from 23 to 66 years ($M = 40.4$, $SD = 12.1$). The majority of participants were female (85 percent); 4 percent had completed high school or vocational school, 24 percent had some college experience, 41 percent had a college degree, and 30 percent had a masters or PhD degree. Most of the participants worked as office and administrative support (42 percent), in the domain of education, training, or library (34 percent), or in the domain of business and financial, computer and mathematical, or health care support (each 5 percent). On average, they worked 41.9 hours per week ($SD = 3.9$), and organizational tenure ranged from 0.1 to 34 years ($M = 7.8$; $SD = 8.0$).

The data collection procedure was the same as Study 2. Of the 74 participants, 71 (96 percent) completed the study. On average, the participants filled in 27.7 surveys ($SD = 2.3$) and finished the study within 13.1 days ($SD = 3.5$). Overall, participants completed 729 morning surveys (92 percent response rate), 684 end-of-work surveys (86 percent response rate), and 639 bedtime surveys (80 percent response rate), corresponding to an average of 9.9 ($SD = 1.3$) morning surveys, 9.2 ($SD = 1.4$) end-of-work surveys, and 8.6 ($SD = 1.7$) bedtime surveys per person.

Table 4. (Continued)

	Depressive mood				Angry mood			
	Bedtime		Next morning		Bedtime		Next morning	
	B	T	B	T	B	T	B	T
Intercept	1.28*	32.99	1.25*	26.70	1.22*	33.70	1.27*	35.54
Between-person effects								
Neuroticism	0.15*	2.65	0.14*	2.58	0.16*	3.23	0.19*	3.31
Psychological detachment	−0.08	−1.08	−0.07	−1.12	−0.09	−1.13	−0.10	−1.43
Negative work reflection	0.20*	2.59	0.23*	3.36	0.17*	2.05	−0.21*	2.70
Positive work reflection	−0.22*	−3.06	−0.29*	−3.84	−0.18*	−2.26	−0.22*	−2.92
Within-person effects								
Day	<0.01	0.50	<.01	0.24	0.01	1.16	<0.01	0.21
DV at the end of work	0.22*	3.99	0.10*	2.00	0.16*	3.57	0.14*	2.50
Psychological detachment	−0.06*	−3.44	0.01	0.57	−0.06*	−3.29	<0.01	−0.06
Negative work reflection	0.05*	2.22	0.03	1.00	0.09*	3.04	0.03	1.12
Positive work reflection	−0.06*	−2.57	−0.02	−0.62	−0.08*	−3.06	−0.03	−1.09

Control and intervention conditions

Participants were randomly assigned to either the control or the intervention condition (each 40 participants; final sample size: $N_{\text{control group}} = 38$, $N_{\text{intervention group}} = 36$). In the morning and at bedtime, participants of the control and the intervention conditions filled in the same surveys. At the end of the end-of-work survey, however, participants in the intervention condition were requested to write three good work-related things that had happened at work that day and an explanation as to why they thought these events had occurred. Participants were told to focus exclusively on work-related events rather than events relevant to their personal lives. As noted earlier, reporting three good things is an intervention introduced by Seligman and colleagues (e.g., Seligman et al., 2005, 2006) that has been successfully implemented in the work context (Bono et al., 2013). We checked whether the participants had taken the task seriously by reading their answers and observed no systematic lack of effort. Accordingly, data from all participants in the intervention group were used for the analyses.[2] Participants of the control condition had no additional task to complete at the end of the end-of-work survey.

Measures

We used the same measures as in Study 2.

Confirmatory factor analysis. As in Study 2, we conducted various multilevel confirmatory analyses to test whether positive work reflection, negative work reflection, and psychological detachment are distinct constructs. Results supported that the three measures reflect different constructs in that a three-factor model fitted well ($\chi^2(105) = 451.07$, comparative fix index = 0.95, Tucker–Lewis index = 0.94, root mean square error of approximation = 0.07, $SRMR_{\text{within}} = 0.05$, $SRMR_{\text{between}} = 0.05$), whereas all two-factor models and the one-factor model did not show adequate fit. Detailed results of the various models can be obtained from the first author.

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[2]Although we found no systematic lack of compliance, there were both interindividual differences and intraindividual variability (i.e., daily fluctuations) regarding participants' compliance. We conducted additional analyses using two different indicators of compliance, namely number of reported events and number of words used to describe the events. Findings from these analyses indicated that the effectiveness of the intervention did not depend on participants' compliance, both on the interindividual and intraindividual levels.

Table 5. Sample sizes, means, standard deviations, and correlations of the measures (Study 3).

Variables	N	M	SD_{b-p}	SD_{w-p}	ICC	1	2	3	4a	4b	4c
1. Positive work reflection	639	2.76	0.69	0.74	.46	(.94)	.44*	−.03	−.08	.14*	.10*
2. Negative work reflection	639	2.62	0.66	0.80	.41	.14	(.94)	−.22*	−.07	−.03	−.10*
3. Psychological detachment	639	3.55	0.67	0.82	.40	.05	−.39*	(.88)	.04	.09	.11*
4. Serenity											
a. Morning	729	2.49	0.72	0.57	.61	.09	−.13	.34*	(.70)	.27*	.17*
b. End of work	684	2.42	0.71	0.57	.55	.16	−.14	.33*	.92*	(.72)	.33*
c. Bedtime	639	2.60	0.66	0.61	.54	.08	−.10	.37*	.86*	.87*	(.68)
5. Joviality											
a. Morning	729	2.16	0.75	0.64	.58	.14	−.26*	.22	.73*	.62*	.61*
b. End of work	684	2.19	0.71	0.59	.59	.22	−.20	.22	.66*	.66*	.65*
c. Bedtime	639	2.07	0.66	0.57	.58	.16	−.19	.26*	.68*	.62*	.67*
6. Depressive mood											
a. Morning	729	1.33	0.51	0.41	.60	−.11	.23	−.46*	−.42*	−.36*	−.44*
b. End of work	684	1.28	0.45	0.36	.61	−.07	.24*	−.48*	−.41*	−.38*	−.46*
c. Bedtime	639	1.33	0.48	0.42	.56	−.04	.24*	−.43*	−.37*	−.32*	−.42*
7. Angry mood											
a. Morning	729	1.29	0.43	0.40	.54	−.08	.41*	−.39*	−.35*	−.29*	−.28*
b. End of work	684	1.30	0.35	0.46	.38	−.09	.46*	−.39*	−.33*	−.33*	−.30*
c. Bedtime	639	1.28	0.42	0.42	.50	.02	.43*	−.41*	−.29*	−.24*	−.31*
8. Neuroticism	74	2.64	0.56	—	—	−.08	.17	−.12	−.35*	−.30*	−.36*
9. Group[a]	74	0.49	—	—	—	.11	.03	.11	.08	.14	−.01

Note: SD and ICC are based on variance estimates of unconditional (null) models. Correlations above the diagonal reflect the within-person associations of the constructs. Correlations below the diagonal reflect the between-person associations of the aggregated measures. Reliability estimates (for daily measures: ω, calculated according to Shrout and Lane, 2012; for trait measure: α) are shown in parentheses in the diagonal of the table. SD_{b-p} = between-person standard deviation; SD_{w-p} = within-person standard deviation; ICC = intraclass correlation (proportion of the between-person variance compared with the total variance).
[a]0 = *control condition* and 1 = *intervention condition*.
*$p < .05$. Two-tailed tests.

Results and discussion

We used the same statistical procedure to analyze the data as in Study 1 and Study 2. To test the effect of the intervention, we additionally included group (0 = *control condition* and 1 = *intervention condition*) as an uncentered Level 2 predictor. Means, standard deviations, intraclass correlations, and zero-order correlations are shown in Table 5. On the within-person level, positive work reflection was positively correlated with negative work reflection. Furthermore, positive work reflection was unrelated to psychological detachment, whereas negative work reflection was negatively related to psychological detachment. Table 6 presents results from the multilevel analyses. Within person, positive work reflection predicted joviality, depressive mood, and angry mood at bedtime as well as in the next morning. However, no significant relationship was detected with serenity. Thus, Hypothesis 1 was supported for the most part. The pattern of relationships was similar for negative work reflection (with reversed signs); psychological detachment, however, was unrelated to changes in well-being.

Concerning the effect of the intervention, the intervention group did not differ from the control group regarding positive work reflection ($B = 0.15$, $T = 1.03$, $p = .31$), negative work reflection ($B = 0.03$, $T = 0.19$, $p = .85$), and psychological detachment ($B = 0.15$, $T = 0.92$, $p = .36$) during leisure time. Thus, Hypothesis 2a was not supported. Contrary to Hypothesis 2b, the two groups did not differ with regard to well-being at bedtime and in the next

Table 5. (Continued)

Variables	5a	5b	5c	6a	6b	6c	7a	7b	7c	8
1. Positive work reflection	.04	.14*	.14*	.04	−.02	−.11*	.06	−.05	−.14*	—
2. Negative work reflection	−.03	−.03	−.11*	.00	.16*	.13*	.04	.17*	.13*	—
3. Psychological detachment	.05	.07	.11*	−.04	−.09	−.06	−.06	−.12*	−.12*	—
4. Serenity										
a. Morning	.61*	.23*	.13*	−.25*	−.11*	−.04	−.27*	−.10*	−.05	—
b. End of work	.19*	.52*	.26*	−.10*	−.30*	−.20*	−.10*	−.33*	−.20*	—
c. Bedtime	.13*	.25*	.51*	.00	−.17*	−.33*	−.03	−.09	.35*	—
5. Joviality										
a. Morning	(.83)	.42*	.22*	−.27*	−.07	−.03	−.26*	−.13*	−.05	—
b. End of work	.89*	(.79)	.40*	−.14*	−.28*	−.15*	−.10*	−.30*	−.11*	—
c. Bedtime	.91*	.93*	(.75)	−.10*	−.19*	−.27*	−.10*	−.19*	−.26*	—
6. Depressive mood										
a. Morning	−.36*	−.33*	−.33*	(.73)	.32*	.21*	.62*	.20*	.16*	—
b. End of work	−.30*	−.32*	−.29*	.96*	(.66)	.41*	.28*	.64*	.34*	—
c. Bedtime	−.28*	−.30*	−.28*	.91*	.94*	(.72)	.19*	.26*	.64*	—
7. Angry mood										
a. Morning	−.34*	−.27*	−.23	.78*	.74*	.70*	(.71)	.27*	.14*	—
b. End of work	−.26*	−.25*	−.18*	.67*	.68*	.67*	.88*	(.75)	.36*	—
c. Bedtime	−.27*	−.23*	−.20	.77*	.79*	.85*	.87*	.86*	(.71)	—
8. Neuroticism	−.37*	−.32*	−.33*	.23	.22	.13	.18	.16	.14	(.76)
9. Group[a]	−.04	−.05	−.08	.10	.05	.08	.13	.08	.10	.06

morning. As post hoc analyses, we tested whether the intervention effect depends on individual characteristics (neuroticism and aggregated measures of well-being; Froh, Kashdan, Ozimkowski, & Miller, 2009) as well as whether the intervention effect unfolded over time (e.g., group differences may exist only in the second week). All additional tests were non-significant. Results of the post hoc analyses can be obtained from the first author.

In sum, consistent with findings from Study 1 and Study 2, positive work reflection during leisure time had positive effects on daily fluctuations in well-being. However, the three-good-things intervention had no impact on participants' work reflections and well-being during leisure time.

Meta-Analytical Summary

Although similar patterns of relationship were observed between positive work reflection and affective well-being across the three studies, some inconsistencies were found, and the effects associated with positive work reflections were not always significant. To gauge the reliability of this effect, we conducted a meta-analysis. Following Rosenthal (1978, see also Edgington, 1972), we used the method of adding probabilities (i.e., combining the probabilities of the three (independent) studies), which has good power and is applicable when the number of studies is small. Results indicated that positive work reflection significantly predicted all four facets of affective well-being in the evening (serenity: $p < .001$; joviality: $p = .002$; depressive mood: $p < .001$; angry mood: $p < .001$) as well as in the next morning (serenity: $p = .021$; joviality: $p = .011$; depressive mood: $p = .004$; angry mood: $p = .001$). In sum, Hypothesis 1 was supported.

Table 6. Multilevel analyses predicting well-being at bedtime and in the next morning (Study 3).

	Serenity				Joviality			
	Bedtime		Next morning		Bedtime		Next morning	
	B	T	B	T	B	T	B	T
Intercept	2.51*	25.59	2.46*	23.34	2.18*	20.79	2.24*	17.57
Between-person effects								
Neuroticism	−0.38*	−3.10	−0.43*	−3.05	−0.27*	−2.32	−0.42*	−2.85
Psychological detachment	0.32*	3.54	0.31*	2.81	0.22*	2.79	0.12	0.10
Negative work reflection	0.12	1.29	0.03	0.12	−0.10	−1.04	−0.18	−1.36
Positive work reflection	0.10	1.20	0.01	0.07	0.14	1.51	0.16	1.36
Group[a]	−0.03	−0.25	0.12	0.75	−0.19	−1.33	−0.01	−0.04
Within-person effects								
Day	<0.01	0.02	<0.01	0.76	<0.01	0.52	−0.01	−1.15
DV at the end of work	0.29*	5.29	0.11*	2.81	0.33*	6.94	0.10	1.29
Psychological detachment	0.04	0.87	0.05	1.31	0.02	0.69	0.01	0.16
Negative work reflection	−0.08*	−2.08	−0.05	−1.21	−0.12*	−3.71	−0.09*	−2.13
Positive work reflection	0.08	1.63	0.10[†]	1.95	0.11*	3.25	0.16*	4.26

Note: DV = dependent variable.
[a]0 = *control condition* and 1 = *intervention condition*.
*$p < .05$; †$p < .10$. Two-tailed tests.

Supplementary Analyses: Between-Person Effects of Positive Work Reflection

So far, we have reported results of the within-person effect of positive work reflection on well-being. Although it was not the main focus of the present study, we examined the effect of between-person differences. According to various authors (e.g., Dalal et al., 2014; Hamaker, 2012), it is critical to consider within-person and between-person relationships simultaneously because the relationship between two constructs at within-person level may differ from the relationship between the analogous constructs at the between-person level in size or sign. In our case, however, we expected a positive relationship between positive work reflection and well-being at between-person level building on the previous research (Daniel & Sonnentag, 2014; Fritz & Sonnentag, 2005, 2006).

In Study 1, positive work reflection was positively associated with serenity, depressive mood, and angry mood at bedtime (Tables 1 and 2). Thus, individuals who engage in higher levels of positive work reflection reported not only higher serenity but also more negative mood at bedtime than people who engage in lower positive work reflection. In contrast, positive work reflection was uniformly associated with better well-being (higher serenity and joviality, lower depressive mood and anger) in Study 2 (Tables 3 and 4).[3] In Study 3, positive work reflection was not significantly related to well-being (Tables 5 and 6).

We also examined the reliability of the between-person effects with a meta-analysis using the method of adding probabilities (Rosenthal, 1978). Results indicated that positive work reflection was positively related to positive affect in the evening (serenity: $p = .003$; joviality: $p = .002$) and in the next morning (serenity: $p = .011$; joviality: $p = .004$). However, it was unrelated to negative affect (for depressive mood: evening: $p = .311$; morning: $p = .222$; for angry mood: evening: $p = .521$; morning: $p = .422$), which is not unexpected considering the opposite results in Studies 1 and 2.

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[3]Additional analyses without neuroticism, negative work reflection, and psychological detachment as Level 2 predictors revealed similar patterns, suggesting that the difference between the mixed findings from Study 1 and the consistent findings from Study 2 cannot be explained by the control variables.

Table 6. (Continued)

| | Depressive mood | | | | Angry mood | | | |
| | Bedtime | | Next morning | | Bedtime | | Next morning | |
	B	T	B	T	B	T	B	T
Intercept	1.29*	19.20	1.27*	17.30	1.24*	26.55	1.24*	26.40
Between-person effects								
Neuroticism	0.03	0.07	0.08	0.85	<0.01	0.01	0.05	0.81
Psychological detachment	−0.20*	−2.60	−0.26*	−3.04	−0.13	−1.60	−0.11	−0.09
Negative work reflection	0.06	0.07	0.04	0.39	0.13[†]	1.88	0.21*	2.10
Positive work reflection	−0.06	−0.70	−0.08	−0.83	−0.01	0.92	−0.05	0.08
Group[a]	0.09	0.84	0.11	1.04	0.12	1.63	0.11	1.20
Within-person effects								
Day	−0.01	−0.90	−0.01[†]	−1.81	−0.01	−1.61	−0.01	−1.32
DV at the end of work	0.41*	4.98	0.12	1.43	0.22*	3.83	0.05	0.84
Psychological detachment	0.02	0.78	0.01	0.26	−0.01	−0.26	−0.01	0.76
Negative work reflection	0.06*	2.06	0.05[†]	1.72	0.05*	2.16	0.06*	2.37
Positive work reflection	−0.08*	−2.27	−0.06*	−2.41	−0.07*	−2.49	−0.08*	−3.31

General Discussion

The objective of the present research was to examine the effect of positive work reflection during leisure time on affective well-being at bedtime and the next morning. Evidence from multiple diary studies generally supported the notion that positive thoughts about work during leisure time are beneficial for employee well-being (Sonnentag & Fritz, 2015). Furthermore, we tested the effectiveness of an intervention to increase positive work reflection and to improve well-being. Given the dearth of research that focuses on interventions that target positive behaviors (Semmer, 2011), our randomized controlled experiment to evaluate the three-good-things intervention (Seligman et al., 2005, 2006) in the work context makes a unique contribution to the literature.

Effects of work reflection on well-being

In line with our assumption, positive work reflections were positively related to well-being. While not all effects across three diary studies were significant, the meta-analytical findings provided support that positive work reflection was associated with an increase in affective well-being, with regard to both positive and negative moods. By demonstrating that positive work reflection reduces negative mood, our findings expand the extant literature that suggests positive work reflection increases positive mood (Daniel & Sonnentag, 2014; Sonnentag & Grant, 2012). Of theoretical importance, this pattern contradicts the notion that independent processes underlie the origin and regulation of positive and negative emotions (e.g., Carver et al., 2000; Gable et al., 2003). Considering that other empirical studies (e.g., Bono et al., 2013; Nezlek & Plesko, 2003) have also reported that a similar process might underlie for positive and negative emotions, we call for further scrutiny on the assumption of independent origin of positive and negative affects.

Extending previous research (Sonnentag & Grant, 2012) that focused on affective reactions in the evening, our meta-analytical summary showed that positive work reflection predicted well-being in the next morning, indicating that the salutary effects of positive work reflection are lasting. This lasting effect of positive work reflection is important for two reasons. First, the improved well-being in the morning may result in more proactive behaviors during the

work day (Fritz & Sonnentag, 2009), which likely triggers further positive work reflection later that day (Sonnentag & Grant, 2012). Thus, a virtuous cycle between work behavior and work-related thoughts during leisure time might exist. Second, the prospective effects on well-being in the following morning provide some confidence in the causal order of the proposed effects. Scholars (e.g., Ohly, Sonnentag, Niessen, & Zapf, 2010; Podsakoff, MacKenzie, & Podsakoff, 2012) have suggested to temporally separate predictor and outcome variables to avoid artificial inflations of the relationship and to gain information about the direction of the effect. In line with that, Sonnentag and Grant (2012) noted that their study design (work reflection and mood have been collected concurrently at bedtime) did not allow them to rule out the possibility that positive mood led to positive reflection. Our lagged effects of work reflection in the evening on affective well-being in the next morning, while controlling for well-being at the end of work as a baseline suggest that work reflection contributes to an improvement of mood. Notably, this does not exclude the possibility that mood has an impact on positive work reflection as well.[4] In sum, future research is warranted that examines the reciprocal relationship between work reflection and affective well-being.

Although the main objective of the current paper was to understand the effects of positive work reflection on well-being, the findings for negative work reflection and psychological detachment are also noteworthy. Regarding the effects of negative work reflection on well-being, the results were similar to that of positive work reflection. This finding supports previous research that has linked negative reflections about work with impaired well-being (e.g., Cropley et al., 2015). We also found that psychological detachment predicted well-being at bedtime after controlling for work reflections (Study 2), which suggests that the beneficial effect of psychological detachment reflects more than a lack of rumination and worries about work during the off-job time. To the best of our knowledge, no previous research has examined whether psychological detachment has positive effects that go over and above negative work-related thoughts, although the two may coexist depending on the degree of psychological detachment. The benefit of psychological detachment on affective well-being that is independent of work-related cognitions might be explained by reduced physiological activation. Geurts and Sonnentag (2006) noted that prolonged cognitive activation (i.e., work reflection) and ongoing work demands (i.e., job-related activities) may negatively affect the recovery process by sustaining physiological activation. It is possible that individuals who are working during off time (i.e., low detachment) stay physiologically activated without necessarily having positive or negative cognitions about their work. Importantly, ongoing physiological arousal results in exhaustion, which is often related to impaired mood (e.g., McNair et al., 1992; Michielsen, De Vries, & Van Heck, 2003). Taken together, failing to psychologically detach might impair affective well-being via sustained physiological arousal and feelings of exhaustion, which are independent of the affective valence of work reflection during leisure time.

Effectiveness of an intervention to increase positive work reflection

In contrast to our expectation, the three-good-things intervention (Seligman et al., 2005, 2006) did not change participants' level of positive work reflection and affective well-being. This finding also contradicts previous research that used this intervention in the work context, which documented lower stress, fewer health complaints, and greater psychological detachment (Bono et al., 2013) and higher life satisfaction and more positive affect (Chan, 2010) among employees who participated in the intervention. Several differences with regard to the study design might help understanding the inconsistent findings. First, Bono et al. (2013) used a within-person study design (i.e., participants completed the intervention during the second week of the study, but not during the first week), whereas we used a between-person study design. While a between-person study design has an advantage of decreased demand characteristics (i.e., participants are exposed to only one condition), the statistical power to detect effects is lower. Second, as mentioned previously, participants of the two previous studies were instructed to reflect on good things that happened that day, which were not limited to work context (e.g., spouse calls and shares good news about their children). In contrast, participants in our study were instructed to reflect only on things that were work-related.

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[4]Additional analyses revealed that affective well-being at the end of work predicted positive work reflection during leisure time in all three studies.

Interestingly, Bono et al. noted that almost half of the entries for the positive daily reflection were related to the family context. The difference in the events that were reflected by participants might explain the discrepancy in findings across studies. Finally, the length of the intervention in Chan (2010) was two months, which is longer than our study. The meta-analyses showed that the effect sizes tend to be larger in studies that implemented interventions with longer durations (Sin & Lyubomirsky, 2009). It is also noteworthy that our study design does not allow us to examine whether a positive effect of the intervention can be attributed to writing about good things or to writing in general because we did not have a condition in which participants were required to write about neutral events. Research outside the work context (e.g., Seligman et al., 2005) suggests that it is not the writing per se that enhances well-being as participants in the placebo condition (writing about their early memories) reported no improvement in well-being, but more research in the work context is needed.

Practical implications

Findings from the current research offer several practical implications. First, positive reflection about work during off-job time is beneficial for employee well-being. Our results suggest that thinking about work during off-job time (i.e., lack of psychological detachment) is not necessarily harmful for employee well-being; rather, the impact of work reflection on employee health seems to be determined by its contents. This is encouraging given that positive work reflection is relatively easy and effortless compared with other interventions (e.g., stress management and mindfulness/meditation trainings; Poulin, Mackenzie, Soloway, & Karayolas, 2008). All in all, employees are advised to pay attention to their thoughts about work during off-job time and engage in positive thinking about work when possible. Second, the contents of positive reflections matter and positive reflection intervention focused exclusively on work-related thoughts may not be an effective strategy to enhance employee well-being. To maximize the benefits, interventions should guide employees to reflect on not only work environment but also to nonwork environment.

Between-person effects

In understanding the effects of positive work reflection on well-being, considering both within-person and between-person effects is important because they are informative for different research questions (Curran & Bauer, 2011; Dalal et al., 2014). Within-person effects in the context of a diary study focus on short-term changes within an individual, hence, are particularly well suited to test the psychological process (Hamaker, 2012) such as how fluctuations of positive work reflection and affective well-being are linked. Between-person effects, in contrast, focus on interindividual differences in more stable characteristics, thereby informing us on the relationship between more enduring experiences and states such as the relationship between general level of positive work reflection and chronic affective well-being.

   The results for the between-person effects from our studies are mixed. While the meta-analytical findings indicate a positive relationship between positive work reflection and positive affect, the relationship between positive work reflection and negative affect was not significant. These findings suggest that whereas specific instances of positive work reflections have salutary effects on momentary positive and negative affects (within-person effects), relatively stable differences in positive work reflection are only related to relatively chronic level of positive but not negative affective well-being (between-person effects). Thus, on the within-person level, the effects seem to be broader than on the between-person level. This might be because the effects of positive events tend to dissipate quickly (Baumeister et al., 2001), thereby having a significant short-term (within-person) effect. In contrast, in the long run, on a more general level, positive work reflection seems only to build up affect-congruent resources but not to eliminate strain.

Limitations and avenues for future research

One of the major limitations of the present research is that we exclusively focused on affective well-being as the outcome. Therefore, we propose that future research on work reflection should also examine the effects on additional well-being indicators as well as physiological markers as cortisol or blood pressure. Future studies should also test the role of time more explicitly by using longitudinal designs with different time lags. Although diary studies provide valuable information regarding short-term effects of work reflection by examining daily fluctuations of work reflection and well-being, they are mute on longitudinal effects. Both for theoretical and practical reasons, the knowledge about enduring effects of positive work reflection is critical. Previous studies have provided preliminary evidence that time is important in understanding the effect of positive work reflection. For instance, Fritz and Sonnentag (2005) investigated the longitudinal effects of positive work reflection with a relatively short time lag (weekend) and found significant effects on exhaustion. In contrast, a study that examined the effect of work reflection during vacations with a longer time lag (two weeks) found no effect (Fritz & Sonnentag, 2006).

Next, as noted by Sonnentag (2012a), some employees may benefit more from psychological detachment, whereas others may profit more from positive work reflection. Generally, little research exists on the role of inter-individual differences with regard to the effect of cognitions (e.g., work reflection and psychological detachment) during leisure time on well-being. The present research is no exception and does not address the moderating role of individual characteristics.[5] Future research should examine the role of personality variables such as positive affectivity (Watson, Clark, & Tellegen, 1998) and trait savoring (Bryant & Veroff, 2007) on the relationship between work reflection and well-being.

For deeper understanding of the effect of positive work reflection, future research should take a closer look at the concept of positive work reflection. Existing studies (including ours) did not examine the source, contents, and attribution of the reflection although these factors might qualify the effects of reflection on proximal and distal outcomes. As findings from Bono et al. (2013) and our study suggest, a systematic investigation of the source of positive reflection is warranted. For example, future research might want to compare interventions focusing solely on work-related positive reflections to other variations of positive reflections such as positive reflections on personal life domain and positive reflections on both work and nonwork domains. Regarding the content of reflection, perceived importance of positive work-related events might be critical to understand the implications of positive reflection. For example, we should not expect a pleasant conversation with a customer and a promotion to have the same impact on someone's well-being. Concerning attribution, internal attribution of a positive event (e.g., abilities) is likely to trigger feelings of pride, whereas external attribution (e.g., supervisor's support) is likely to evoke feelings of gratitude (Weiner, 1985). Investigating attribution is particularly important as previous research showed that how individuals attribute their positive work experiences affects their behavior at work. For example, gratitude is assumed to cause more contextual behavior such as interpersonal helping, whereas pride may lead to less contextual behavior (Hu & Kaplan, 2015).

Finally, previous research on the role of work reflection further shows that its effect on performance improvement also depends on the focus (Ellis et al., 2014); learning effects from positive reflection on one's successful performance were greatest for those individuals who focused on the actions that hindered goal progress (Ellis, Mendel, & Nir, 2006). Although it is not intuitive to expect that the same benefit holds for short-term effects on well-being because focusing on negative aspects might attenuate the beneficial effect of a personal success, research by Koo, Algoe, Wilson, and Gilbert (2008) suggests otherwise. A set of studies showed that people's mood improved more when they had to write about a positive event that might never have happened and was surprising than when they had to report an event that was unsurprising. It is reasonable to assume that focusing on one's erroneous actions when thinking about a successful experience triggers counterfactual thoughts ('Things could have been worse'); as a result, the fact that one was successful at the end may even come as a surprise ('Considering that I made these mistakes, it is actually a surprise that I succeeded'). Based on this rationale, it is possible that reflecting about

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[5]Exploratory analyses with neuroticism as a moderator variable showed no interaction effects.

erroneous actions after a successful experience may improve affective well-being. Moreover, considering erroneous actions may help increase well-being in the long run because of its positive effect on one's performance, which should be linked to improved well-being (Grebner, Elfering, & Semmer, 2010). In sum, we suggest that future research on guided reflection at work should build on the two lines of research and simultaneously consider well-being and performance as outcome.

Conclusion

In a series of diary studies, we investigated the effect of positive work reflection on well-being and tested the effectiveness of an intervention to promote positive work reflection. Findings suggest that reflecting on positive sides of work during nonwork time is beneficial for affective well-being and that the benefit is incremental to that of psychological detachment and the absence of negative work reflection. No support was found for the effectiveness of the three-good-things intervention in increasing positive work reflection and improving well-being. In sum, our research calls for further investigation for ways to promote positive work reflection.

Acknowledgements

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Laurenz L. Meier is a postdoctoral researcher at the University of Fribourg, Switzerland. The focus of his research lies in the intersection of organizational, social, and personality psychology, specifically in the fields of job stress, antisocial behavior at work, and work-family conflict. His methodological interests are multilevel and longitudinal data analysis.
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