

## **DOING GOOD AT WORK FEELS GOOD AT HOME, BUT NOT RIGHT AWAY: WHEN AND WHY PERCEIVED PROSOCIAL IMPACT PREDICTS POSITIVE AFFECT**

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When and why does the experience of helping others at work spill over into positive affect at home? This paper presents a within-person examination of the association between perceived prosocial impact at work and positive affect at home, as well as the psychological mechanisms that mediate this relationship. Sixty-eight firefighters and rescue workers completed electronic diaries twice a day over the course of 1 working week. Random-coefficient modeling showed that perceived prosocial impact predicted positive affect at bedtime. This relationship was mediated by perceived competence at the end of the working day and positive work reflection during after-work hours but not by positive affect at the end of the working day. The findings demonstrate that the experience of helping others at work has delayed emotional benefits at home that appear to be channeled through the cognitive mechanisms of perceived competence and reflection rather than through an immediate affective boost.

Helping others can have beneficial effects, not only for help recipients but also for helpers themselves (Batson, 1990; Penner, Dovidio, Piliavin, & Schroeder, 2005). Laboratory studies have shown that helping others increases one's own positive affective states (Dunn, Aknin, & Norton, 2008; Lyubomirsky, Sheldon, & Schkade, 2005; Williamson & Clark, 1989), and field studies have shown that volunteering to help others is associated with positive affect (Hecht & Boies, 2009; Thoits & Hewitt, 2001). Recently, researchers have begun to study the emotional benefits of

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helping others through one's job. Evidence suggests that employees who perceive their jobs as helping others experience more energy and positive affect (e.g., Saavedra & Kwun, 2000).

Despite this general evidence on the affective benefits of helping, little is known about how the affective experience of helping as part of one's job unfolds during the day and how it influences life beyond work. This is an important oversight, as research on spillover processes provides evidence that employees' experiences on the job have a substantial impact on their affective states and behaviors at home (e.g., Eby, Maher, & Butts, 2010; Greenhaus & Powell, 2006; Rothbard, 2001). For example, studies have shown that daily experiences at work spill over into the home domain (Ilies et al., 2007; Story & Repetti, 2006). This day-level research has focused primarily on negative job events such as heavy workloads and negative social interactions, largely neglecting positive experiences (for a recent exception, see Ilies, Keeney, & Scott, 2011). Negative experiences, however, are often more influential than positive ones (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001; Rozin & Royzman, 2001). Therefore, it should not be taken for granted that the spillover processes that have been documented for negative experiences can be also observed for positive experiences. Moreover, research has emphasized short-term affective reactions as the core mechanism underlying spillover (Greenhaus & Powell, 2006). The literature on the effects of helping (Williamson & Clark, 1989) and on the predictors of affect (Morris, 1989), however, suggests that other processes—particularly positive self-evaluations and positive recollections—might play a role as well. As such, we compare cognitive and emotional mechanisms through which the experience of helping others at work is associated with positive affect at home.

Our research makes two key contributions to applied psychological and organizational scholarship. First, we extend beyond existing research on how helping in one domain enhances positive affect in that domain by examining whether the experience of helping others at work has spillover effects in predicting positive affect at home. Our theoretical arguments and empirical evidence inform knowledge about the consequences of positive work events for affect outside work. Second, we shed light on the underlying processes that explain these effects, exploring immediate positive affect, perceived competence, and reflection about work as mechanisms that may mediate these spillover effects. In doing so, we investigate immediate and more delayed mediators. Our focus on the within-person level enables a closer look at the microprocesses through which the experience of helping others influence employees' functioning (Dalal & Hulin, 2008), shedding light on the delayed impact of work experiences on affect at home.

### Hypothesis Development

To understand employees' experiences of helping others at work, we focus on perceived prosocial impact. Perceived prosocial impact is the perception that one's actions on the job are beneficial to others (Grant & Campbell, 2007). Previous research has examined employees' global experiences of prosocial impact—their general evaluations of their actions as benefiting others—as predictors of their affective states (Grant & Campbell, 2007; Grant & Sonnentag, 2010). However, employees' perceptions of prosocial impact may not only differ between jobs and people but may also fluctuate within persons from day to day. For example, firefighters will be more likely to perceive prosocial impact on a day when they succeed in rescuing a family from a burning house than when spending the day at the station waiting for emergency calls or arriving at a site too late to provide help.

Our interest is in examining the relationship between perceived prosocial impact at work and positive affect at home. Because our study addresses within-person fluctuations, we focus on positive affect as a state. Positive affect is a pleasant emotional state characterized by positive valence (Watson, Clark, & Tellegen, 1988). Positive affect at home is not only a pleasurable experience in and of itself; it matters for affective states and behaviors on the job. Research has shown that affect at home spills over into affect experienced at work (Song, Foo, & Uy, 2008; Williams & Alliger, 1994). Moreover, affective states can influence on-the-job behavior not only on the same day but also on subsequent days (Amabile, Barsade, Mueller, & Staw, 2005).

Although researchers have often studied positive affect as a unitary state, it can be characterized on a continuous dimension of activation. At the high end of the continuum, activated positive affect corresponds to feelings of being active, energetic, elated, excited, and enthusiastic (Watson, 1988). At the low end of the continuum, deactivated positive affect corresponds to feelings of calmness and serenity (Russell & Carroll, 1999). In our study, we assess both activated and deactivated positive affect, answering calls to adopt a more nuanced perspective on positive affective states, rather than lumping different types of positive affect together (Brief & Weiss, 2002; Fredrickson, 2001).

Our overarching prediction is that perceived prosocial impact at work will be related to higher positive affect at bedtime. Based on research on the sources of mood (Morris, 1989) and on the immediate effects of helping (Williamson & Clark, 1989), we posit that this benefit of prosocial impact can be explained by immediate and more delayed mediators.

Morris (1989) argued that events of affective significance constitute the major sources of mood. Based on a review of studies examining different

antecedents of affect, he concluded that mildly pleasant and unpleasant events, as well as the recollection (and imagination) of emotional events, are empirically supported sources of mood (Morris, 1989).<sup>1</sup> Thus, events themselves and recollection of these events are prime candidates for influences on mood. Building on this evidence, we focus on perceived prosocial impact as a positive affective event and on positive work reflection as the recollection of positive work-related events as sources of positive affective states. Examining events as immediate precursors of affective states is also consistent with affective events theory (Weiss & Cropanzano, 1996, p. 31), which emphasizes “the role of events as proximal causes of affective reactions.” Thus, experiencing an event of affective significance should be rather immediately reflected in the person’s affective state at the end of the working day, whereas the recollection of such an event should predict affective states later on the day during reflection. Important, according to research on affective spillover (Edwards & Rothbard, 2000), the more immediate affective reaction can also result in a spillover of affect from work to the home domain (Ilies et al., 2007; Song et al., 2008).

Helping others is a specific event that should not only result in positive affect, either immediately when experiencing the event itself or later when remembering the event. In addition to an increase in positive affect, previous research on the benefits of helping has identified a second core proximal outcome of helping: an increase in positive self-evaluations (Williamson & Clark, 1989). In a series of experiments, Williamson and Clark (1989) found that positive self-evaluations increased after acts of helping. In particular, helping others is an experience of success that can boost feelings of competence (Grant, 2007; Penner et al., 2005). Perceived competence is a core motive in life (Ryan & Deci, 2000) and at work (Spreitzer, 1995). When employees help others, they feel that they have effectively contributed to other people’s lives (Caprara & Steca, 2005). Therefore, when examining the day-to-day benefits of prosocial impact, we will include perceived competence as an important self-evaluation.

In summary, we examine positive affect and perceived competence as proximal mediators and positive work reflection as a more distal mediator. Building on Morris (1989), we propose that perceived prosocial impact—as an actual event of affective significance—predicts relatively short-term affective states at the end of the working day, whereas the recollection

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<sup>1</sup>Morris (1989) originally differentiated between four categories of affective events: (a) experiencing a mildly negative or mildly positive event, (b) the offset of an event that has produced an emotion, (c) recalling or imagining an emotional event, and (d) the inhibition of an emotional reaction following an emotion-inducing event. He identified studies providing support for the influence of (a) mildly pleasant and unpleasant events and (b) the recollection or imagination of emotional events, but indicated that evidence for the affect-inducing effects of the other two sources is limited.

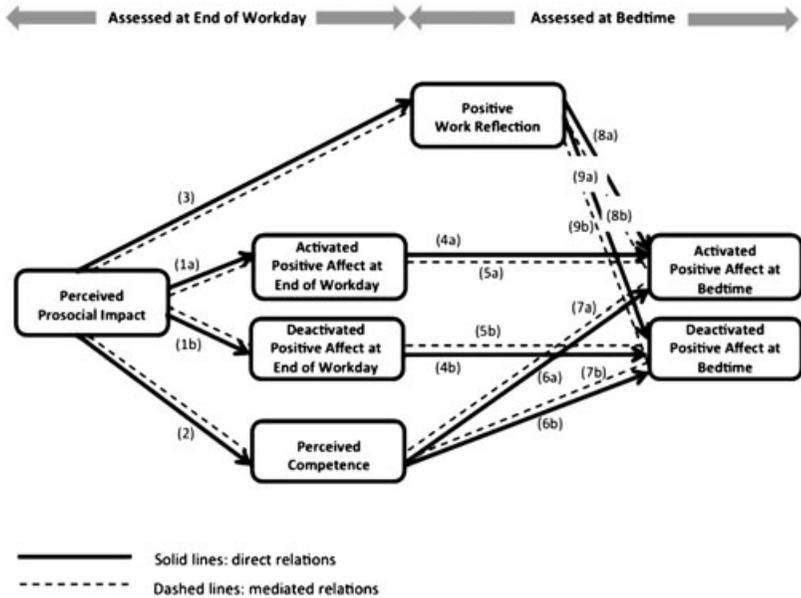


Figure 1: Conceptual Model.

of past events predicts affective states later on the day when being at home. These arguments are summarized in Figure 1, which displays our conceptual model.

*Perceived Prosocial Impact as Predictor of Positive Affect at the End of the Working Day*

Perceived prosocial impact is likely to foster positive affect at the end of the working day. Perceived prosocial impact at work can be seen as a positive event—a positive event that the employee's actions have influenced or caused (Grant, 2007, 2008)—which has the potential to stimulate positive affect. Indeed, research has shown that when employees perceive their actions as helping others, they experience positive affect, manifested in positive affective states such as positive mood (Glomb, Bhawe, Miner, & Wall, 2011), happiness (Dunn et al., 2008; Williamson & Clark, 1989), and empathic joy (Batson, 1990; Smith, Keating, & Stotland, 1989). We expect to find this association both for activated and deactivated positive affect.

Perceived prosocial impact is likely to increase activated positive affect. In a helping profession, benefiting others is an important

job-related goal and a relevant aspect of employees' professional identity (Halpern, Gurevich, Schwartz, & Brazeau, 2009). Research has shown that goal accomplishment and progress in goal attainment predict activated positive affect (Harris, Daniels, & Briner, 2003; Scott, Colquitt, Paddock, & Judge, 2010). Because helping increases activated positive affect when helping is personally relevant and valued (Weinstein & Ryan, 2010), particularly in settings in which helping is an inherent part of the job, employees' experience of having a prosocial impact will be relevant for their subsequent activated positive affect. Employees experience activated positive affect when they succeed in promoting a positive outcome (Brockner & Higgins, 2001). When employees perceive prosocial impact, they feel that they have achieved meaningful gains for others, which is likely to lead to strong positive feelings of joy and enthusiasm. Consistent with this logic, a recent day-level study demonstrated that the more nurses felt that they had accomplished their core nursing tasks to their satisfaction, the more positive activated emotions such as "excited" or "proud" increased from preshift to postshift (Gabriel, Diefendorff, & Erickson, 2011).

Perceived prosocial impact will also increase deactivated positive affect, in the form of feelings of contentment and relief. When employees perceive prosocial impact, they are able to avoid harming others (Molinsky & Margolis, 2005) or letting them down (Brockner & Higgins, 2001), which will be reflected in increased levels of deactivated positive affect at the end of the working day. For example, perceiving prosocial impact as a firefighter or rescue worker implies that a dangerous and uncertain process has come to a good end. This, according to Ellsworth and Smith (1988), makes states of deactivated positive affect most likely, as employees have prevented or avoided a negative outcome (Brockner & Higgins, 2001). Indeed, Gabriel et al. (2011) found that nurses experienced an increase from pre- to postshift in affective states such as "calm" and "relaxed" when they were satisfied with completing core nursing tasks. Thus, we propose that experiencing prosocial impact during the day at work will be positively related to activated and deactivated positive affect at the end of the working day.

*Hypothesis 1:* Perceived prosocial impact at work will be positively related to (a) activated and (b) deactivated positive affect at the end of the working day.

#### *Perceived Prosocial Impact as Predictor of Perceived Competence*

Perceived prosocial impact should not only be relevant for subsequent affect but also for perceived competence. Perceived competence

is the judgment of oneself as capable of acting effectively (Spreitzer, 1995). Important, perceptions of competence do not only differ between employees but also fluctuate within employees from day to day. Laboratory studies have demonstrated that perceptions of competence and self-efficacy vary substantially within persons over time (Seo & Ilies, 2009; Yeo & Neal, 2006). Similarly, field studies using a daily survey approach showed that perceptions of competence show substantial variability from day to day (Reis, Sheldon, Gable, Roscoe, & Ryan, 2000; Sheldon & Niemeic, 2006).

Previous mastery experiences and past successful performances influence an individual's perceptions of competence (Reis et al., 2000; see also Bandura, 1997). Perceived prosocial impact can be seen as such a mastery experience and should therefore be beneficial to subsequent perceptions of competence. The experience of helping involves contributing successfully to others' health and well-being, and is likely to boost employees' judgments of their own capabilities of doing their work effectively. Indeed, several studies have shown that the experience of helping others effectively in volunteering is associated with higher perceptions of competence and self-efficacy (for a review, see Penner et al., 2005). In contrast, failing to help successfully has been linked with lower perceptions of competence. As Rosen, Mickler, and Collins (1987, p. 288) summarize, "Such disconfirmed expectations might reflect negatively on the helper's self-image by inducing self-doubt. . . about. . . his or her own control over the impersonal environment (task-relevant competence)" and "own efficacy in exerting interpersonal control." Particularly in helping occupations, the experience of benefiting others should contribute to the belief that one is capable and effective. However, also in other kinds of jobs, helping others should increase confidence in one's ability to bring about change, such as alleviating suffering or increasing meaning. Experimental and intervention studies with students and people who are chronically ill demonstrate that helping others increases positive self-evaluations (Schwartz & Sendor, 1999; Williamson & Clark, 1989). Based on these arguments and findings, we propose that when employees perceive prosocial impact they will experience higher day-specific competence.

*Hypothesis 2:* Perceived prosocial impact at work will be positively related to perceived competence on that working day.

#### *Perceived Prosocial Impact as a Predictor of Positive Work Reflection*

Momentary affective states originate from multiple sources. In addition to events themselves, the recollection of past emotional experiences is a major influence on affective states (Morris, 1989). Whereas events

can have immediate effects on affective states, recollections influence processes that may unfold over a comparably longer period of time (Morris, 1989). This perspective implies that perceived prosocial impact might be related to affect at home via recollection as a delayed psychological process.

Positive work reflection is a form of recollection that refers to contemplating the favorable features of one's job during nonwork time and remembering positive events encountered during the working day (Fritz & Sonnentag, 2005). Positive work reflection is not necessarily an in-depth elaboration of the job's positive features but can be a rather short reappraisal episode of work events and experiences (Lazarus & Folkman, 1984). Positive work reflection can be seen as a job-specific form of savoring, or recalling and reminiscing about positive events in ways that amplify, prolong, or rekindle the feelings that they elicited (Bryant, 1989).

In general, experiences in the workplace influence job-related cognitions during after-work hours. For example, employees who face stressful conditions at work tend to ruminate negatively about their jobs and find it difficult to detach mentally from work when at home (Cropley, Dijk, & Stanley, 2006; Sonnentag & Fritz, 2007). However, employees may not only take home negative experiences; positive experiences can influence job-related thoughts when at home (Rothbard, 2001). The perception of prosocial impact is a positive, meaningful experience that can prompt reflection about how one's past actions mattered, imbuing them with significance in the social world (Elliott, Colangelo, & Gelles, 2005; Rosenberg & McCullough, 1981). There are at least two reasons why employees will engage in more positive work reflection after having experienced prosocial impact at work: First, after a positive experience at work, employees will be less inclined to look for mental distraction from work. Studies have shown that people have a stronger tendency to distract themselves from an event when it was negative and undesirable than when it was positive and desirable (Langston, 1994; Marco, Neale, Schwartz, Shiffman, & Stone, 1999). Thus, perceived prosocial impact is a positive work-related event that will attract and maintain employees' attention. Second, based on the account of fundamental differences between the behavioral approach versus inhibition system (Sutton & Davidson, 1997), the content of the reflection itself will be more positive (Gable, Reis, & Elliot, 2000). Research demonstrates that the experience of positive events triggers positive evaluations. For instance, positive events are related to more positive evaluations of the self (Nezlek & Gable, 2001) and of one's life (Gable, Reis, Impett, & Asher, 2004). Accordingly, the evaluation of one's job will be more positive after positive events marked by perceived prosocial impact.

*Hypothesis 3:* Perceived prosocial impact at work will be positively related to positive work reflection during after-work hours.

*Mediators of the Relationship Between Perceived Prosocial Impact and Positive Affect at Bedtime*

Positive affect at the end of the working day may spill over into positive affect at home. Affect experienced in one life domain (e.g., work) tends to influence affect experienced in another life domain (e.g., home) so that the affective experiences in both domains become similar (Edwards & Rothbard, 2000). For example, when an employee is in a positive affective state at work during the day, it is likely that he or she will also be in a positive affective state when being at home in the evening. Edwards and Rothbard (2000) suggested that spillover of affect between two life domains occurs via enhanced cognitive functioning, increased task activity and persistence, and improved social interactions that all enhance performance and reward in the receiving domain and, in turn, increase positive affect in this domain. Research has provided empirical evidence for such affective spillover processes, both at the between-person level (e.g., Greenhaus & Powell, 2006; Rothbard, 2001) and the within-person level (e.g., Ilies et al., 2007; Judge & Ilies, 2004). For instance, using an experience-sampling strategy, Song et al. (2008) found that positive affect at work predicted positive affect at home during the evening, even after controlling for trait positive affect. We expect arousal-specific spillover processes and propose:

*Hypothesis 4a:* Activated positive affect at the end of the working day will be positively related to activated positive affect at bedtime.

*Hypothesis 4b:* Deactivated positive affect at the end of the working day will be positively related to deactivated positive affect at bedtime.

Based on our prior reasoning that perceived prosocial impact should be related to positive affect at home, we predict the following:

*Hypothesis 5a:* Activated positive affect at the end of the working day will mediate the relationship between perceived prosocial impact at work and activated positive affect at bedtime.

*Hypothesis 5b:* Deactivated positive affect at the end of the working day will mediate the relationship between perceived

prosocial impact at work and deactivated positive affect at bedtime.

Perceived competence should be positively related to positive affective states. This effect should not be only an immediate one but should spill over into employees' nonwork lives and become evident later in the day (Edwards & Rothbard, 2000; Greenhaus & Powell, 2006). There is extensive evidence that feeling competent promotes positive affect (Ryan & Deci, 2000). We expect this association between perceived competence at work and affect at home both for activated positive affect and for deactivated positive affect. Feeling competent at the end of the working day implies a sense of progress, which is energizing (Harris et al., 2003). In addition, perceived competence signals that one feels capable of mastering the tasks and challenges that one might face during subsequent days (Bandura, 1997). This confidence that one will be able to address future challenges successfully can generate enthusiasm and comfort (Bandura, 1997). Day-level studies show that people experience higher levels of activated positive affect on days when they feel competent (Reis et al., 2000; Sheldon & Niemeic, 2006). Moreover, perceived competence should also be related to feelings of calmness and serenity (i.e., deactivated positive affect): When employees feel competent, they can anticipate the next working day in a more relaxed state. Grebner, Elfering, and Semmer (2010) have argued that perceived competence and success lower the probability of ruminating about work. Thereby, negative affective states such as anger and anxiety are reduced (McCullough, Bono, & Root, 2007; Segerstrom, Tsao, Alden, & Craske, 2000) and feelings of calmness and serenity become more likely.

*Hypothesis 6:* Perceived competence will be positively related to (a) activated and (b) deactivated positive affect at bedtime.

Linking Hypotheses 2 and 6, we propose the following mediation hypothesis:

*Hypothesis 7:* Perceived competence will mediate the relationship between perceived prosocial impact at work and (a) activated and (b) deactivated positive affect at bedtime.

In addition to positive affect at the end of the working day and perceived competence, positive work reflection during after-work hours is likely to contribute to subsequent positive affect. Recalling positive events leads to increases in positive affect (Morris, 1989). Moreover, positive affective outcomes of savoring everyday events and experiences outside

work are well-documented in the literature (Emmons & McCullough, 2003; Tugade & Fredrickson, 2007). Specifically, when employees look back on the past working day during after-work hours and remember the positive and meaningful moments, positive affect will increase. When employees reflect positively on work, they focus on the favorable aspects of their work and interpret what they have encountered during the day in a positive light (Bryant, 1989). Such reflection, in turn, will increase positive affect by enabling employees to relive and reexperience the positive events (Gable et al., 2004). As a result, positive experiences will become more salient, enhancing positive affect (Hicks & Diamond, 2008). Indeed, research in the broader context of savoring and gratitude has shown that reflecting on positive events and experiences adds to the prediction of positive affect, beyond the effect of the event itself (Bryant, 1989, 2005; Emmons & McCullough, 2003). We expect these findings both for activated and deactivated positive affect: Positively reflecting about the past work day may instigate enthusiasm and excitement but may also lead to a content and relaxed feeling of having fulfilled one's core responsibilities.

*Hypothesis 8:* Positive work reflection during after-work hours will be positively related to (a) activated and (b) deactivated positive affect at bedtime.

Linking Hypotheses 3 and 8, we predict that positive work reflection at home mediates the relationship between prosocial impact and positive affect at bedtime.

*Hypothesis 9:* Positive work reflection during after-work hours will mediate the relationship between perceived prosocial impact at work and (a) activated and (b) deactivated positive affect at bedtime.

## Method

### *Sample*

For our study, we selected a sample of firefighters and rescue workers. These jobs offer considerable opportunities to experience prosocial impact, but at the same time, they are highly stressful (Brough, 2004; Halpern et al., 2009) and therefore require that employees capitalize on the positive experiences they encounter in their daily work (see Folkman & Moskowitz, 2000). Our sample comprised 44 firefighters and 24 ambulance and other rescue workers working in Switzerland (63.2%), Germany (33.8%), and Austria (2.9%). The majority of the sample was

male (86.8%), with a mean age of 37.1 years ( $SD = 9.3$ ) and mean job tenure of 13.3 years ( $SD = 8.6$ ).

### *Procedures*

We recruited the participants from professional fire brigades and ambulance stations. We presented managers with a proposal, explained the procedures, and offered to deliver a feedback report at the end of the study. Upon obtaining agreement from managers at several fire brigades and ambulance stations, we distributed information packets to paid (not volunteer) ambulance workers and firefighters employed in these organizations. The information packets included a detailed description of the study objectives and procedures, as well as a return form for registration. The study was introduced as research on work experiences in firefighting and rescue work. After potential participants had registered, research assistants sent a general survey and scheduled dates for consigning handheld computers to collect daily survey data. During onsite face-to-face meetings, research assistants provided instruction about how to answer the daily surveys implemented on the handheld computer. Employees then completed our initial survey and daily measures.

Study participation required completing a general survey and two daily surveys per day (one after work and one at bedtime) over a period of 5 working days. In total, 113 employees agreed to participate and received the general survey. Of these employees, 97 returned the filled-in general survey, for a completion rate of 85.8%. Of these 97 employees, 84 responded to the daily after-work surveys on the handheld computers, providing data for a total of 397 days; and 81 responded to the daily bedtime surveys, providing data for a total of 371 days. The handheld computers recorded a time stamp indicating survey-completion time. Of the 397 after-work surveys, 324 (81.6%) were completed at the correct times. We excluded the remaining after-work surveys because they were completed at the wrong times (e.g., the next morning) or during shifts that included on-call duty, allowing for sleep at the worksite. Of the 371 bedtime surveys, 294 (79.2%) were completed at the correct times and were therefore considered for inclusion in further analyses. On average, participants responded to the bedtime items 217 minutes after they had responded to the after-work items. We matched after-work data with bedtime data answered on the same days, resulting in a total of 226 surveys from 68 participants.

Participants who answered the daily surveys did not differ significantly from those who did not answer the daily surveys with respect to job autonomy, sex, age, country, and other background data. In addition, we checked whether answering the after-work or bedtime survey at wrong

times was related to any of our day-level study variables (time pressure, emotional dissonance, time on accident or fire site, perceived prosocial impact, positive affect at the end of the working day, positive work reflection, positive affect at bedtime). We found no significant differences between days with wrong versus correct time stamps.

### *Measures*

We collected our data with an after-work and a bedtime survey, both implemented on handheld Palm Pilot computers and to be completed at home. In addition, we used a general paper-based survey, which was completed prior to starting the daily surveys, to assess person-level control variables. After work, on a daily basis, we assessed perceived prosocial impact, positive affect at the end of the working day, perceived competence, and a range of control variables (time pressure, emotional dissonance, and work at accident or fire site). At bedtime, also on a daily basis, we assessed positive work reflection during after-work hours and positive affect at bedtime. If not otherwise noted, participants responded to the items on a five-point Likert-type scale where 1 = *fully disagree* and 5 = *fully agree*.

*Perceived prosocial impact.* We assessed day-specific perceived prosocial impact immediately after the end of the working day with Grant's (2008) three-item scale, adapted for day-level assessment (e.g., "I feel that my work today made a positive difference in other people's lives"). Cronbach's alphas computed separately for the five days of data collection ranged between 0.91 and 0.95 ( $M = 0.93$ ).

*Positive affect at the end of the working day.* We assessed activated and deactivated affect at the extreme ends of the activation continuum. We asked respondents to answer the items with respect to how they felt "now, after work" using a five-point Likert-type response format with 1 = *not at all* and 5 = *fully*. We assessed activated positive affect at the end of the working day with six items from the PANAS: active, interested, excited, strong, inspired, and alert (Watson, Clark, & Tellegen, 1988). In line with earlier research (Sonnentag, Binnewies, & Mojza, 2008), we used this subset of items in order to keep the survey short. Cronbach's alphas ranged between 0.80 and 0.89 ( $M = 0.84$ ). To assess deactivated affect at the end of the working day, we used four items from the measure developed by Abele-Brehm and Brehm (1986): calm, relaxed, laid-back, and placid. Cronbach's alphas ranged between 0.81 and 0.88 ( $M = .86$ ).

*Perceived competence.* We measured day-specific perceptions of competence with five items from the scale developed and validated by Chen, Gully, and Eden (2001). Sample items are "When facing difficult tasks at work today, I was certain that I could accomplish them" and

"Today at work, I succeeded at most endeavors to which I set my mind." These items show substantial similarity to other items from instruments that assess perceived competence (Ilardi, Leone, Kasser, & Ryan, 1993; Reis et al., 2000), and they are consistent with the definition of competence as the psychological experience of effectiveness and success (Ryan & Deci, 2000; White, 1959). Cronbach's alpha for the 5 days ranged between 0.82 and 0.89 ( $M = 0.86$ ).

*Positive work reflection.* At bedtime, we assessed positive work reflection during after-work hours with four items from Binnewies, Sonnentag, and Mojza (2009). Again, we adapted these items for day-specific assessment (e.g., "Today after work, I thought about the good sides of my work"). Cronbach's alphas ranged between 0.72 and 0.88 ( $M = 0.81$ ).

*Positive affect at bedtime.* We measured bedtime affect with the same items and response format as used for the end-of-working-day assessment. This time, participants were instructed to report how they felt "now, before going to bed." Cronbach's alphas ranged between 0.71 and 0.87 ( $M = 0.81$ ) for activated positive affect and between 0.81 and 0.90 ( $M = 0.86$ ) for deactivated positive affect.

To examine whether the three variables assessed at bedtime (positive work reflection, activated positive affect, and deactivated positive affect) constituted three distinct constructs, we conducted a confirmatory factor analysis with person-mean centered scores as suggested by Bolger, Davis, and Rafaeli (2003). The hypothesized three-factor model showed good fit,  $\chi^2(74) = 136.99$ , CFI = 0.92; RMSEA = 0.06, and was superior to the best-fitting two-factor model,  $\chi^2(76) = 209.33$ , CFI = 0.86; RMSEA = 0.09,  $\Delta\chi^2(2) = 72.34$ ,  $p < 0.001$ , and to a one-factor model with all items loading on a common factor,  $\chi^2(77) = 331.07$ , CFI = 0.78; RMSEA = 0.12,  $p < 0.001$ ,  $\Delta\chi^2(3) = 194.08$ ,  $p < 0.001$ .

*Day-level control variables.* Because job stressors encountered during the day may be associated with our study variables, particularly with affect (Zohar, Tzischinski, & Epstein, 2003), we controlled for time pressure and emotional dissonance as two prominent stressors in emergency and human service work, and amount of time spent on accident or fire sites. Specifically, we assessed day-specific time pressure with three items adapted from the measure developed by Semmer (1984), which included the item "Today, I worked under time pressure," and achieved Cronbach's alphas ranging between 0.76 and 0.81 ( $M = 0.80$ ). We measured day-specific emotional dissonance with five items adapted from the measure suggested by Zapf, Vogt, Seifert, Mertini, and Isic (1999), which included the item "Today, I had to display emotions that did not correspond to my sincere inner feelings" and achieved Cronbach's alphas ranging between 0.87 and 0.92 ( $M = 0.89$ ). Because being actually present at an emergency

site (vs. doing maintenance work) might provide more opportunities to provide help and might also impact affective states, we controlled for time spent on accident or fire site (single item measure).

We tested whether the Likert-type measures assessed after work (perceived prosocial impact, perceived competence, activated positive affect at the end of the working day, deactivated positive affect at the end of the working day, time pressure, and emotional dissonance) could be appropriately modeled as distinct constructs. Confirmatory factor analyses based on person-mean centered scores (Bolger et al., 2003) revealed that a six-factor model with all items loading on their respective factors,  $\chi^2(284) = 535.53$ , CFI = 0.93, RMSEA = 0.052, fit the data better than alternative multiple-factor models ( $\chi^2(298) = 596.89$ , CFI = 0.92, RMSEA = 0.058,  $p < 0.001$ ;  $\Delta\chi^2(5) = 61.36$ ,  $p < 0.001$ , for the best-fitting five-factor model) and a one-factor model with all items loading on a common factor,  $\chi^2(350) = 2886.27$ , CFI = 0.61, RMSEA = 0.150,  $p < 0.001$ ;  $\Delta\chi^2(66) = 2350.92$ ,  $p < 0.001$ .

*Person-level control variables.* Because demographic and other background variables might influence how employees perceive their jobs and react to them, we controlled for gender, age, country of data collection (dummy coded), and type of job (rescue worker vs. firefighter). Moreover, because more autonomous jobs are associated with positive affective states (Humphrey, Nahrgang, & Morgeson, 2007) and might also offer more opportunities for providing help, we controlled for job autonomy, using the five-item measure developed by Semmer (1984), which included the item "Can you influence the way how you accomplish your tasks?" to be answered on a five-point Likert-type scale (1 = *very little*; 5 = *to a high degree*). Cronbach's alpha was 0.85.

### *Data Analysis*

To take the nonindependence of the day-level data nested within persons into account, we conducted our main analysis with random coefficient modeling, using MLwiN software (Rasbash et al., 2000). Before testing our hypotheses, we centered day-level predictor and day-level control variables at the respective person mean (i.e., averaged across all days of data collection) and the person-level control variables at the grand mean. Centering day-level variables at the person mean implies that between-person variance is removed from these data and that findings are not attributable to interindividual differences. We tested our mediator hypotheses with the bootstrap procedure implemented in Mplus, following a multilevel structural equation modeling (MSEM) approach as suggested by Preacher, Zyphur, and Zhang (2010).

## Results

Table 1 displays means, standard deviations, and correlations between study variables. Analysis of variance components at the day level (Level 1) and at the person level (Level 2)<sup>2</sup> revealed substantial variation in all core variables, both at the person and the day level, making multilevel modeling most suitable for data analysis.

### *Test of Hypotheses*

We tested our hypotheses with a set of multilevel models. For all sets, we started with a null model with the intercept as the only predictor. In Model 1, we included control variables at Levels 1 and 2. In Model 2, we entered our predictor variables of interest as fixed effects. We tested the improvement of each model over the previous one with a log-likelihood statistic ( $-2 \cdot \log$ ) and with the degrees of freedom corresponding to the number of predictors added to the model. We start with presenting the analyses in which we predict our four potential mediators (activated positive affect, deactivated positive affect, perceived competence, positive work reflection) and then present the analyses in which we predict activated and deactivated positive affect at bedtime.

Hypothesis 1 stated that perceived prosocial impact predicts positive affect at the end of the working day. Table 2 presents the findings for activated positive affect. Model 1, which added the control variables, fit the data better than the null model. Specifically, working in Switzerland (as compared to Austria), being younger, and having a high degree of job autonomy predicted activated positive affect at the end of the working day. Perceived prosocial impact, entered in Model 2, did not contribute to the prediction of activated positive affect at the end of the working day. Table 3 shows the findings for predicting deactivated positive affect at the end of the working day. Model 1, which included the control variables,

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<sup>2</sup>For activated positive affect at bedtime, the variance attributable to day-level variation was 44.3% (see null model in Table 6), and the variance attributable to person-level variation was 55.7%. For deactivated positive affect at bedtime, the variance attributable to day-level variation was 55.5% (see Table 7), and the variance attributable to person-level variation was 44.5%. For activated positive affect and deactivated positive affect at the end of the working day, the variance components attributable to the day level were 48.8 and 35.7%, respectively (see Tables 2 and 3), and the variance components attributable to the person level were 51.2 and 64.3%, respectively. For perceived competence, the variance attributable to day-level variation was 27.0% (see Table 4), and the variance attributable to person-level variation was 73.0%. For positive work reflection, the variance attributable to day-level variation was 49.6% (see Table 5), and the variance attributable to person-level variation was 50.4%. For perceived prosocial impact, the respective variance components were 51.6% ( $0.478 / [0.478 + 0.449] = 0.516$ ) at the day level and 48.4% ( $0.449 / [0.478 + 0.449] = 0.484$ ) at the person level (no table).

TABLE 1  
*Means, Standard Deviations, and Zero-Order Correlations Between Study Variables*

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Dummy Country 1	0.63	0.48																
2. Dummy Country 2	0.34	0.47	-0.94															
3. Job	1.65	0.48	-0.22	0.18														
4. Gender	1.87	0.34	0.06	-0.09	-0.28													
5. Age	37.12	9.35	0.36	-0.31	-0.44	0.37												
6. Job autonomy	3.51	0.76	0.05	-0.07	0.28	0.02	0.07											
7. Day-specific time pressure	2.25	0.75	-0.23	0.19	-0.23	0.03	-0.08	-0.10		0.33	0.25	0.12	-0.02	-0.18	-0.30	0.01	-0.06	-0.11
8. Day-specific emotional dissonance	1.95	0.87	-0.31	0.25	0.11	-0.14	-0.29	-0.31	0.39		0.28	0.18	-0.03	-0.38	-0.38	0.00	-0.21	-0.26
9. Day-specific time spent on accident or fire site	26.31	21.00	-0.33	0.32	0.31	-0.12	-0.36	-0.21	0.23	0.29		0.33	0.19	-0.12	-0.15	-0.20	-0.18	-0.04
10. Day-specific perceived prosocial impact	3.72	0.81	-0.27	0.26	0.34	-0.24	-0.25	0.11	0.08	0.08	0.34		0.46	0.07	0.04	0.05	0.10	0.12
11. Day-specific perceived competence	3.91	0.74	-0.18	0.21	0.10	-0.17	-0.21	0.16	-0.07	-0.14	0.25	0.62		0.28	0.26	-0.09	0.19	0.36
12. Day-specific activated positive affect at the end of working day	2.69	0.64	0.17	-0.06	0.11	0.01	-0.15	0.36	-0.16	-0.45	-0.04	0.29	0.45		0.72	0.17	0.49	0.48
13. Day-specific deactivated positive affect at end of working day	3.03	0.78	0.11	-0.05	0.00	-0.10	-0.13	0.13	-0.32	-0.50	-0.12	0.25	0.36	0.77		0.13	0.42	0.60
14. Day-specific positive work reflection	2.43	0.76	-0.02	-0.03	-0.03	-0.04	-0.00	0.07	0.01	0.06	-0.34	0.05	-0.00	0.23	0.24		0.28	0.09
15. Day-specific activated positive affect at bedtime	2.14	0.62	0.14	-0.12	-0.16	0.16	0.05	0.22	-0.05	-0.24	-0.16	0.09	0.25	0.54	0.39	0.36		0.47
16. Day-specific deactivated positive affect at bedtime	3.18	0.71	0.14	-0.10	-0.04	0.03	-0.03	0.20	-0.05	-0.29	-0.05	0.26	0.46	0.62	0.68	0.19	0.51	

*Note.* Correlations below the diagonal are person-level correlations ( $n = 67$  with correlations  $r \geq 0.25$ ,  $p < 0.05$  and  $r \geq 0.31$ ,  $p < 0.01$ ). Correlations above the diagonal are day-level correlations with noncentered scores ( $n = 228$  with correlations  $r \geq 0.17$ ,  $p \leq 0.01$ ). Dummy Country 1: Austria = 0; Switzerland = 1. Dummy Country 2: Austria = 0; Germany = 1. Gender: 1 = *female*; 2 = *male*. Job: 1 = *rescue worker*; 2 = *firefighter*.

TABLE 2

*Multilevel Estimates for Predicting Activated Positive Affect at the End of the Working Day From Perceived Prosocial Impact at Work*

	Null model			Model 1			Model 2		
	Estimate	SE	<i>t</i>	Estimate	SE	<i>t</i>	Estimate	SE	<i>t</i>
Intercept	2.689	0.076	35.382	1.518	0.666	2.279*	1.468	0.655	2.241*
Dummy Country 1				0.823	0.373	2.206*	0.832	0.370	2.249*
Dummy Country 2				0.516	0.372	1.387	0.518	0.368	1.408
Job				-0.082	0.157	-0.522	-0.077	0.155	-0.497
Gender				0.292	0.204	1.431	0.311	0.203	1.532
Age				-0.024	0.009	-2.667**	-0.025	0.008	-3.125**
Job autonomy				0.353	0.098	3.602**	0.352	0.088	4.000**
Day-specific time pressure				-0.062	0.061	-1.016	-0.063	0.061	-1.033
Day-specific emotional dissonance				-0.060	0.069	-0.870	-0.065	0.069	-0.942
Day-specific time spent on accident or fire site				0.000	0.002	0.000	0.001	0.002	0.500
Day-specific prosocial impact							0.055	0.062	0.887
-2*log (lh)			452.643			428.342			427.557
Diff -2*log <sup>a</sup>						24.301**			0.785
Df						9			1
Level 1 intercept variance (SE)						0.281 (0.031)			0.281 (0.031)
Level 2 intercept variance (SE)						0.167 (0.045)			0.161 (0.045)

Notes. \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ . Dummy Country 1: Austria = 0; Switzerland = 1. Dummy Country 2: Austria = 0; Germany = 1. Gender: 1 = female; 2 = male. Job: 1 = rescue worker; 2 = firefighter.

TABLE 3

*Multilevel Estimates for Predicting Deactivated Positive Affect at End of the Working Day From Perceived Prosocial Impact at Work*

	Null model			Model 1			Model 2		
	Estimate	SE	<i>t</i>	Estimate	SE	<i>t</i>	Estimate	SE	<i>t</i>
Intercept	3.056	0.095	32.168	2.687	0.912	2.946**	2.643	0.909	2.908**
Dummy Country 1				1.013	0.520	1.948	1.021	0.517	1.974
Dummy Country 2				0.692	0.518	1.336	0.694	0.515	1.348
Job				-0.298	0.217	-1.373	-0.294	0.216	-1.361
Gender				-0.038	0.281	-0.135	-0.021	0.280	-0.075
Age				-0.026	0.012	-2.167*	-0.026	0.012	-2.167*
Job autonomy				0.225	0.123	1.829	0.244	0.122	2.000*
Day-specific time pressure				-0.064	0.060	-1.067	-0.065	0.060	-1.083
Day-specific emotional dissonance				-0.081	0.068	-1.191	-0.084	0.069	-1.217
Day-specific time spent on accident or fire site				-0.003	0.002	-1.500	-0.003	0.002	-1.500
Day-specific prosocial impact							0.042	0.062	0.677
-2*log (lh)			484.522			466.972			466.518
Diff -2*log <sup>a</sup>						17.550*			0.454
Df						9			1
Level 1 intercept variance (SE)			0.281(0.031)			0.274(0.031)			0.274(0.031)
Level 2 intercept variance (SE)			0.507(0.105)			0.402(0.086)			0.397(0.086)

*Note.* \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ . Dummy Country 1: Austria = 0; Switzerland = 1. Dummy Country 2: Austria = 0; Germany = 1. Gender: 1 = female; 2 = male. Job: 1 = rescue worker; 2 = firefighter.

resulted in a slightly better model fit than the null model; age was a significant negative predictor of deactivated positive affect at the end of the working day. Perceived prosocial impact, entered in Model 2, did not predict deactivated positive affect at the end of the working day. Thus, Hypotheses 1(a) and (b) were not supported.

Hypothesis 2 proposed that perceived prosocial impact predicts perceived competence. Findings are displayed in Table 4. Model 1, which included the control variables, did not fit the data better than the null model, although day-specific time pressure was positively related to perceived competence. Model 2, which included perceived prosocial impact as the predictor variable of interest, resulted in an increased model fit. The positive coefficient for perceived prosocial impact was significant, providing support for Hypothesis 2.

Hypothesis 3 stated that perceived prosocial impact predicts positive work reflection. Table 5 shows that control variables entered in Model 1 did not result in a better fit than the null model, although emotional dissonance experienced during work was negatively associated with positive work reflection. Upon entering perceived prosocial impact into Model 2, model fit increased, with perceived prosocial impact emerging as a significant predictor of positive work reflection. This finding supports Hypothesis 3.

We had hypothesized that positive affect at the end of the working day (Hypothesis 4), perceived competence (Hypothesis 6), and positive work reflection (Hypothesis 8) predict positive affect at bedtime. We tested these hypotheses in two sets of analyses, one for activated and one for deactivated positive affect. Results for activated positive affect are displayed in Table 6. Model 1, which included the control variables, did not show a better model fit than the null model, although job type and job autonomy were significant predictors of activated positive affect at bedtime. Model 2 including activated and deactivated positive affect at the end of the working day, perceived competence, and positive work reflection fit the data better than Model 1. Positive work reflection, but not positive affect at the end of the working day or perceived, competence, predicted activated positive affect at bedtime. These results are consistent with Hypothesis 8a, but not with Hypotheses 4a and 6a.

Table 7 displays the findings for deactivated positive affect at bedtime as the outcome variable. Model 1, which included the control variables, showed a better model fit than the null model, with day-specific emotional dissonance being a negative predictor of deactivated positive affect at bedtime. Upon entering activated and deactivated positive affect at the end of the working day, perceived competence, and positive work reflection in Model 2, model fit improved. Deactivated positive affect at the end of the working day and perceived competence were significant predictors of

TABLE 4

*Multilevel Estimates for Predicting Perceived Competence at End of the Working Day From Perceived Prosocial Impact at Work*

	Null model			Model 1			Model 2		
	Estimate	SE	<i>t</i>	Estimate	SE	<i>t</i>	Estimate	SE	<i>t</i>
Intercept	3.927	0.085	46.200	4.216	0.851	4.954***	4.006	0.843	4.827***
Dummy Country 1				0.281	0.488	0.576	0.319	0.483	0.660
Dummy Country 2				0.500	0.486	1.029	0.513	0.481	1.066
Job				-0.151	0.203	-0.744	-0.128	0.201	-0.637
Gender				-0.227	0.261	-0.870	-0.149	0.259	-0.575
Age				-0.014	0.011	-1.273	-0.015	0.011	-1.364
Job autonomy				0.196	0.115	1.704	0.190	0.113	1.681
Day-specific time pressure				0.090	0.045	2.000*	0.087	0.043	2.023*
Day-specific emotional dissonance				-0.016	0.051	-0.314	-0.032	0.049	-0.653
Day-specific time spent on accident or fire site				0.000	0.002	0.000	-0.002	0.002	-1.000
Day-specific prosocial impact							0.193	0.044	4.386***
-2*log (lh)			376.359			363.125			344.932
Diff -2*log						13.234			18.193***
Df						9			1
Level 1 intercept variance (SE)						0.158 (0.018)			0.375 (0.073)
Level 2 intercept variance (SE)						0.427 (0.084)			0.137 (0.015)

Notes. \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ . Dummy Country 1: Austria = 0; Switzerland = 1. Dummy Country 2: Austria = 0; Germany = 1. Gender: 1 = female; 2 = male. Job: 1 = rescue worker; 2 = firefighter.

TABLE 5  
*Multilevel Estimates for Predicting Positive Work Reflection During After-Work Hours From Perceived Prosocial Impact at Work*

	Null model			Model 1			Model 2		
	Estimate	SE	<i>t</i>	Estimate	SE	<i>t</i>	Estimate	SE	<i>t</i>
Intercept	2.435	0.086	28.314	3.415	0.900	3.794***	3.268	0.899	3.635***
Dummy Country 1				-0.622	0.512	-1.215	-0.596	0.510	-1.169
Dummy Country 2				-0.633	0.510	-1.241	-0.624	0.508	-1.228
Job				-0.116	0.214	-0.542	-0.101	0.214	-0.472
Gender				-0.103	0.278	-0.371	-0.046	0.278	-0.165
Age				-0.001	0.012	-0.083	-0.001	0.012	-0.083
Job autonomy				0.087	0.122	0.713	0.083	0.121	0.686
Day-specific time pressure				-0.017	0.068	-0.250	-0.020	0.067	-0.299
Day-specific emotional dissonance				-0.174	0.077	-2.260*	-0.187	0.077	-2.429*
Day-specific time spent on accident or fire site				0.002	0.003	0.667	0.001	0.003	0.333
Day-specific prosocial impact							0.159	0.069	2.304*
-2*log (lh)			514.100			506.075			500.816
Diff -2*log						8.025			5.259*
Df						9			1
Level 1 intercept variance (SE)			0.366(0.041)			0.352(0.039)			0.342(0.038)
Level 2 intercept variance (SE)			0.372(0.086)			0.363(0.084)			0.363(0.083)

Note. \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ . Dummy Country 1: Austria = 0; Switzerland = 1. Dummy Country 2: Austria = 0; Germany = 1. Gender: 1 = female; 2 = male. Job: 1 = rescue worker; 2 = firefighter.

TABLE 6

*Multilevel Estimates for Predicting Activated Positive Affect at Bedtime From Perceived Prosocial Impact at Work, Perceived Competence, Activated Positive Affect at the End of the Working Day, and Positive Work Reflection During After-Work Hours*

	Null model			Model 1			Model 2			Model 3		
	Estimate	SE	<i>t</i>	Estimate	SE	<i>t</i>	Estimate	SE	<i>t</i>	Estimate	SE	<i>t</i>
Intercept	2.157	0.073	29.548	1.937	0.701	2.763**	1.814	0.715	2.537**	1.835	0.703	2.610**
Dummy Country 1				0.320	0.398	0.804	0.341	0.405	0.842	0.337	0.399	0.845
Dummy Country 2				0.147	0.397	0.370	0.125	0.404	0.309	0.135	0.397	0.340
Job				-0.366	0.168	-2.179*	-0.364	0.170	-2.141*	-0.356	0.167	-2.132*
Gender				0.285	0.216	1.319	0.347	0.221	1.570	0.324	0.217	1.493
Age				-0.014	0.009	-1.556	-0.013	0.009	-1.444	0.014	0.009	1.556
Job autonomy				0.225	0.095	2.368*	0.218	0.096	2.271*	0.223	0.095	2.347*
Day-specific time pressure				0.028	0.054	0.519	0.033	0.051	0.647	0.026	0.054	0.481
Day-specific emotional dissonance				-0.030	0.062	-0.484	0.019	0.058	0.328	-0.038	0.061	-0.623
Day-specific time spent on accident or fire site				-0.001	0.002	-0.500	-0.002	0.002	-1.000	-0.002	0.002	-1.000
Day-specific activated positive affect at end of working day							0.149	0.079	1.886			
Day-specific deactivated positive affect at end of working day							0.046	0.077	0.597			

*continued*

TABLE 6 (continued)

	Null model			Model 1			Model 2			Model 3		
	Estimate	SE	<i>t</i>	Estimate	SE	<i>t</i>	Estimate	SE	<i>t</i>	Estimate	SE	<i>t</i>
Day-specific perceived competence							0.075	0.085	0.882			
Day-specific positive work reflection							0.202	0.059	3.423***			
Day-specific perceived prosocial impact										0.111	0.055	2.018*
Day-specific perceived prosocial impact										0.111	0.055	2.018*
-2*log (lh)		412.676		400.102					375.885			396.081
Diff -2*log				12.574					24.217***			4.021 <sup>a</sup> ***
Df				9					4			1
Level 1 intercept variance (SE)		0.224(0.025)		0.225(0.025)					0.191(0.021)			0.219(0.024)
Level 2 intercept variance (SE)		0.282(0.063)		0.217(0.051)					0.236(0.053)			0.219(0.051)

Note. \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ . Dummy Country 1: Austria = 0; Switzerland = 1. Dummy Country 2: Austria = 0; Germany = 1. Gender: 1 = female; 2 = male.

Job: 1 = rescue worker; 2 = firefighter.

<sup>a</sup>Compared to Model 1.

TABLE 7

*Multilevel Estimates for Predicting Deactivated Positive Affect at Bedtime From Perceived Prosocial Impact at Work, Perceived Competence, Deactivated Positive Affect at the End of the Working Day, and Positive Work Reflection During After-Work Hours*

	Null model			Model 1			Model 2			Model 3		
	Estimate	SE	<i>t</i>	Estimate	SE	<i>t</i>	Estimate	SE	<i>t</i>	Estimate	SE	<i>t</i>
Intercept	3.219	0.085	37.871	2.632	0.834	3.156**	2.354	0.826	2.850**	2.450	0.816	3.002**
Dummy Country 1				0.724	0.472	1.534	0.748	0.466	1.605	0.755	0.461	1.638
Dummy Country 2				0.458	0.471	0.972	0.422	0.464	0.909	0.469	0.459	1.022
Job				-0.265	0.198	-1.338	-0.230	0.196	-1.173	-0.248	0.194	-1.278
Gender				0.195	0.258	0.756	0.316	0.256	1.234	0.266	0.253	1.051
Age				-0.019	0.011	-1.727	-0.019	0.011	-1.727	-0.019	0.011	-1.727
Job autonomy				0.214	0.113	1.893	0.193	0.111	1.739	0.208	0.110	1.891
Day-specific time pressure				0.027	0.073	0.370	0.010	0.069	0.145	0.022	0.072	0.306
Day-specific emotional dissonance				-0.240	0.083	-2.892**	-0.193	0.078	-2.474*	-0.257	0.082	-3.134**
Day-specific time spent on accident or fire site				-0.002	0.003	-0.666	-0.001	0.003	-0.333	-0.004	0.003	-1.333
Day-specific activated positive affect at end of working day							0.036	0.106	0.340			
Day-specific deactivated positive affect at end of working day							0.239	0.104	2.298*			

*continued*

TABLE 7 (continued)

	Null model			Model 1			Model 2			Model 3		
	Estimate	SE	<i>t</i>	Estimate	SE	<i>t</i>	Estimate	SE	<i>t</i>	Estimate	SE	<i>t</i>
Day-specific perceived competence							0.352	0.114	3.088**			
Day-specific positive work reflection							0.126	0.079	1.595			
Day-specific perceived prosocial impact										0.211	0.073	2.890**
-2*log (lh)		536.466		518.973					492.682			510.810
Diff -2*log				17.493*					26.291***			8.163**
Df				9					4			1
Level 1 intercept variance (SE)			0.425(0.047)			0.406(0.045)			0.349(0.039)			0.394(0.044)
Level 2 intercept variance (SE)			0.341(0.085)			0.279(0.073)			0.285(0.070)			0.263(0.069)

Note. \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ . Dummy Country 1: Austria = 0; Switzerland = 1. Dummy Country 2: Austria = 0; Germany = 1. Gender: 1 = female; 2 = male.

Job: 1 = rescue worker; 2 = firefighter.

<sup>a</sup>Compared to Model 1.

deactivated positive affect at bedtime. This analysis provides support for Hypotheses 4b and 6b, but not for Hypothesis 8b.

Finally, we tested whether positive affect at the end of the working day (Hypothesis 5), perceived competence (Hypothesis 7), and positive work reflection (Hypothesis 9) mediate the relationship between perceived prosocial impact at work and positive affect at bedtime, using the approach suggested by Preacher et al. (2010). We specified one overall multilevel structural equation model that included both activated and deactivated positive affect at bedtime as outcome variables, perceived prosocial impact as predictor variable, and activated and deactivated positive affect at the end of the working day, perceived competence, and positive work reflection as potential mediators.<sup>3</sup> We tested the indirect effects using parametric bootstrap with the Monte Carlo method adapted for multilevel data (MacKinnon, Lockwood, & Williams, 2004; Selig & Preacher, 2008). The indirect effect from perceived prosocial impact to activated positive affect at bedtime via positive work reflection was 0.025, 95% CI [0.0016, 0.0611]; the indirect effect from perceived prosocial impact to deactivated positive affect at bedtime via perceived competence was 0.065, 95% CI [0.0199, 0.1236]. Thus, this analysis provides support for Hypotheses 7b and 9a.

Taken together, perceived prosocial impact predicted activated and deactivated positive affect at bedtime; the association between perceived prosocial impact and activated affect at bedtime was mediated by positive work reflection during after-work hours; and the association between perceived prosocial impact and deactivated affect at bedtime was mediated by perceived competence.

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<sup>3</sup>We first ran a model that included all the control variables that had turned out to be significant in the multilevel regression analysis approach reported in Tables 2–7. In the MSEM approach, only some of the control variables remained significant. We therefore deleted the nonsignificant paths, resulting in a model with an acceptable fit,  $\chi^2 = 90.852$ ,  $df = 48$ ,  $p = 0.0002$ , CFI = 0.903, RMSEA = 0.063. In correspondence with the findings from the multilevel regression analysis, the paths from perceived prosocial impact to positive work reflection,  $\beta = 0.174$ , SE = 0.077,  $t = 2.276$ ,  $p < 0.05$ , and to perceived competence,  $\beta = 0.183$ , SE = 0.051,  $t = 3.544$ ,  $p < 0.001$ , from positive work reflection to activated positive affect at bedtime,  $\beta = 0.146$ , SE = 0.055,  $t = 2.635$ ,  $p < 0.01$ , from perceived competence to deactivated positive affect at bedtime,  $\beta = 0.354$ , SE = 0.106,  $t = 3.344$ ,  $p < 0.01$ , and from deactivated positive affect at the end of the working day,  $\beta = 0.298$ , SE = 0.092,  $t = 3.236$ ,  $p < 0.01$ , were significant. Among the within-person control variables, emotional dissonance was negatively related to positive work reflection,  $\beta = -0.162$ , SE = 0.045,  $t = -3.609$ ,  $p < 0.001$ , and to deactivated positive affect at bedtime,  $\beta = -0.197$ , SE = 0.063,  $t = -3.139$ ,  $p < 0.001$ . At the between-person level, job autonomy was positively related to activated positive affect at the end of the working day,  $\beta = 0.214$ , SE = 0.054,  $t = 3.956$ ,  $p < 0.001$ , and job type was related to positive activated affect at bedtime,  $\beta = -0.355$ , SE = 0.134,  $t = -2.647$ ,  $p < 0.001$ .

### Discussion

Our research offers several theoretical and empirical contributions to applied psychological and organizational research. First, our day-level study demonstrates that the experience of prosocial impact at work is associated with positive work reflection, as well as higher perceived competence, and predicts positive affect at home. Whereas past research has shown that the experience of helping others has psychological benefits within the work domain, our study extends this evidence to cross-domain spillover from work to home.

Second, our research begins to illuminate the timing and mediating mechanisms for the spillover of perceived prosocial impact to affect at home. Interestingly, we found that perceived prosocial impact predicted positive affect at bedtime but not at the end of the working day. This finding implies that positive events are not necessarily followed by immediate positive affect but may have a more delayed impact on the affective system. Our data suggest that this delayed linkage may be due in part to positive work reflection during after-work hours. Thus, leisure hours after work appear to provide the opportunity to recall and reminisce about the meaningful moments of the past working day. It may be the case that particularly in stressful jobs, employees do not fully realize the affective implications of what has happened during the busy day but need some time until they can actually “feel” and process the relevance of what they have accomplished.

The finding that perceived prosocial impact and positive affect at the end of the working day were not concurrently related is particularly noteworthy because one might expect an inflated association between perceived prosocial impact and positive affect at the end of the working day because these constructs were measured at the same time (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). However, we did discover a significant association between perceived prosocial impact and positive affect at bedtime assessed at two different times. This finding dovetails with evidence that positive affect sometimes operates after an incubation period (Amabile et al., 2005). Our study suggests that such an incubation period may also exist in the mechanism that links the experience of helping at work with positive affect at home.

Third, our study extends beyond research showing that mentally detaching from work is associated with improved affective states at home (Sonnentag et al., 2008). This study suggests that there might be situations when reflecting about work has affective benefits.

Finally, we move research on prosocial impact forward by adopting a day-level, within-person perspective. Until now, research on perceived

prosocial impact focused on differences between persons (Grant & Sonnentag, 2010) or used experimental designs (Grant, 2008). More generally, compared to the dominant emphasis on between-person differences in giving help (Penner et al., 2005), within-person processes have rarely been addressed, although researchers have begun to examine them with respect to receiving help (Daniels, Beesley, Cheyne, & Wimalasiri, 2008). Our specific approach lends insight into how fluctuations of perceived prosocial impact at the day level are related to subsequent affective states. This is particularly worthwhile given that past research on spillover processes between different life domains has focused primarily on negative on-the-job events and experiences (Ilies et al., 2007; Story & Repetti, 2006). Our study joins a growing body of research on enrichment (e.g., Greenhaus & Powell, 2006) in showing that positive events and experiences on the job can also spill over to influence affect at home, even when controlling for negative events (i.e., time pressure and emotional dissonance).

Our study extends beyond earlier research on helping behavior and spillover processes from work to home that focused on activated affect (Ilies et al., 2007; Song et al., 2008; Weinstein & Ryan, 2010) or collapsed items referring to activated and deactivated affect into one overall affect measure (Weinstein & Ryan, 2010; Williamson & Clark, 1989). Interestingly, our study revealed different mediating paths for activated versus deactivated positive affect. Whereas positive work reflection predicted activated positive affect, perceived competence predicted deactivated positive affect. This finding suggests that positively reflecting about the past day at work has an energizing component, perhaps because it draws employees' attention to what they like about their jobs (e.g., Emmons & McCullough, 2003) or makes the personal meaning of their jobs more salient for them (e.g., Wrzesniewski & Dutton, 2001). Perceived competence, however, was related to deactivated positive affect in our sample. One explanation for this finding is that perceived competence alleviates anxiety, thereby enabling employees to feel greater calm and serenity. Another explanation is that this finding may be specific to our sample. Within the framework of regulatory focus theory (Brockner & Higgins, 2001), one can describe the jobs of firefighters and rescue workers as primarily prevention focused. Goals related to prevention focus are more strongly related to emotional responses on the quiescence-agitation dimension (e.g., relaxed) than to the cheerfulness-dejection dimension (e.g., happy), in part because prevention goals focus attention on successes as nonlosses rather than as gains (Higgins, Shah, & Friedman, 1997). Thus, when firefighters and rescue workers are confident that they can achieve job-specific prevention goals, they become calm and relaxed rather than excited and enthusiastic.

This effect may have been strengthened by the considerable on-the-job experience ( $M = 13.3$  years) of our participants. It will be important for future studies to examine whether this specific pattern of results for activated versus deactivated positive affect can be replicated with other occupational groups and less experienced employees.

#### *Limitations and Future Directions*

The contributions of this study should be qualified in light of several limitations. We used self-report measures to assess our core constructs, raising concerns about common method biases (Podsakoff et al., 2003). However, because we person-mean centered day-level predictors, we can rule out biases due to stable interpersonal differences. In addition, although it is preferable to use multisource data, our core constructs (perceived prosocial impact, perceived competence, work reflection, affect) primarily refer to internal states that are difficult to observe from the outside. Whenever possible, we separated our day-level assessments in time, which furthermore reduced the likelihood of inflated associations. However, we have to note that positive work reflection and affect at bedtime were assessed concurrently. Thus, we cannot conclusively rule out the possibility that perceived prosocial impact at work contributes directly to activated positive affect, which in turn fuels positive work reflection. Our results that perceived prosocial impact did not predict positive affect at the end of the working day cast doubt on this possibility, as it would be unusual for perceived prosocial impact to have a delayed effect on affect without the operation of intervening cognitive processes.

It may still be the case, though, that perceived prosocial impact fostered activated positive affect at bedtime through additional mechanisms. For example, perceived prosocial impact may have prompted employees to share positive events at home, which in turn gave rise to both positive work reflection and positive affect (Gable et al., 2004). Expressing the positive aspects of the working day may be a particularly effective approach for enhancing positive affect (Hicks & Diamond, 2008). Future studies should pay even greater attention to these additional mechanisms and temporal dynamics, assessing them at distinct points in time.

We deliberately chose a within-person design in order to address the short-term microprocesses associated with perceived prosocial impact. Without negating the importance of this research approach, it would be interesting to address the long-term implications of perceiving prosocial impact at work. Experimental research has demonstrated the effect of perceived prosocial impact on objective behaviors and performance indicators (e.g., Grant, 2008), but the long-term affective implications await empirical investigation. Moreover, future studies might want to test spillover

effects from affect at home to perceived prosocial impact at work during the next day. Finally, our sample comprised professional firefighters and rescue workers. For these employees, perceiving a prosocial impact might be particularly important because helping others is a core element of their jobs. Future research should test whether our findings generalize to other types of jobs in which helping and supporting others is less salient. It would be interesting to identify job and organizational characteristics that moderate the relationship between perceived prosocial impact and positive affective states.

### *Practical Implications*

Our study highlights the importance of perceiving prosocial impact for affective experiences. Supervisors may wish to emphasize employees' prosocial impact by acknowledging their contributions to other people's lives and well-being and providing them with direct access to feedback. Such feedback may be most relevant when employees are too busy during the day to realize what they have accomplished. Particularly after stressful days, supervisors may wish to talk briefly to their employees to make them aware of their contributions during the specific day. Similarly, supervisors may want to encourage team members to support each other by appreciating their day-specific acts of benefiting others. For example, teams at Merrill Lynch and Ritz Carlton hold weekly meetings in which they share stories about the ways in which they have made a difference in customers' lives (Grant, 2011). Moreover, organizational training and coaching programs may want to emphasize the importance of perceived prosocial impact. For instance, training programs could teach employees how to build daily routines of deliberately thinking about how they made a difference during the past working day. In addition, organizations may work toward building cultures in which daily acts of benefiting others are appreciated and rewarded as small wins (Weick, 1984).

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