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**“It’s tough hanging-up a call”: The relationships between calling and work hours, psychological detachment, sleep quality and morning vigor.**

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**“It’s tough hanging-up a call”: The relationships between intensity of a calling, work hours, psychological detachment, sleep quality and morning vigor.**

**Abstract**

It has been argued that when people believe that their work is a calling, it can often be experienced as an intense and consuming passion with significant personal meaning. While callings have been demonstrated to have several positive outcomes for individuals, less is known about the potential downsides for those who experience work in this way. This study develops a multiple-mediation model proposing that, while the intensity of a calling has a positive direct effect on work-related vigor, it motivates people to work longer hours, which both directly and indirectly via longer work hours, limits their psychological detachment from work in the evenings. In turn, this process reduces sleep quality and morning vigor. Survey and diary data of 193 church ministers supported all hypotheses associated with this model. This implies that intense callings may limit the process of recovery from work experiences. The findings contribute to a more balanced theoretical understanding of callings.

Keywords: Calling; Diary; Psychological detachment; Sleep quality; Vigor; Work hours

## **Introduction**

The concept of calling has received growing attention from scholars interested in better understanding how people derive identity, meaning and purpose from their working lives (Duffy & Dik, 2013; Elangovan, Pinder & McLean, 2010). It has been noted that when work is viewed as a calling, people often experience their work as intensely meaningful (Dobrow & Tosti-Kharas, 2011), leading to energy and sustained engagement towards a domain (Elangovan et al, 2010). Nevertheless, the intensity of callings may mean that work also has the potential to become overly consuming and absorbing, which may make it difficult for individuals to disengage (both physically and psychologically) from their calling (Mainemelis, 2001).

The present study investigates the extent to which callings can be experienced as intensely consuming and meaningful and questions whether this has negative, as well as positive, influences on an individual's work-related health. It has been noted that the negative effects of callings have only received limited research attention to date (Dobrow & Tosti-Kharas, 2011; Duffy & Dik, 2013; Elangovan, et al, 2010); this paper addresses this shortcoming of the calling literature in particular. While research exists that has found evidence of both positive and negative effects of calling (e.g. Bunderson & Thompson, 2009), the extent to which negative effects may operate alongside positive effects has received little systematic examination. Mediating or explanatory processes that explain any negative effects have also yet to be fully explored. More generally, the theoretical basis for understanding calling's influence on individual well-being requires significant development (Duffy & Dik, 2013). Accordingly, this paper addresses this gap by proposing and testing a model that suggests that calling intensity can simultaneously energize work behavior but also impede the daily recovery process that is important for sustaining energy.

Specifically this study seeks to examine dual paths between calling intensity and work-related vigor, an important dimension of work engagement (Schaufeli, Bakker & Salanova, 2006). We propose that, while callings may provide individuals with energy to pursue their work and thus directly increase levels of vigor at the start of the day, a secondary process may exist that has the opposite effect on morning vigor. This second, negative path is the main focus of the current study. To this end, we examine the association between calling intensity and work hours, psychological detachment after work and sleep quality; we draw on theories of self-regulation failure (Baumeister & Heatherton, 1996) and the Effort-Recovery Model (Meijman & Mulder, 1998) to frame our hypotheses. Working long hours represents a sustained physical engagement with work tasks over the course of a day which, while potentially allowing an individual to be more productive, is often linked to poorer health if habitual (e.g. Sparks, Cooper, Fried & Shirom, 1997). Psychological detachment, which has been defined as an “individual’s sense of being away from the work situation” (Etzion, Eden & Lapidot, 1998, p. 579) and sleep quality are said to be part of a broader process of recovery from work experiences, which is understood to play an important role in protecting people from work-related strain and in rebuilding resources necessary for effective subsequent work functioning (Zijlstra & Sonnentag, 2006). If an intense calling leads people to work long hours on a given day and limits their ability to detach from and recover after work, this may be potentially problematic for sustaining work-related vigor on subsequent days.

Drawing on data collected from church ministers, a population of workers who can be assumed to have a calling, we test a model (see Figure 1) which proposes that calling intensity enhances the experience of vigor at the start of the day, but also drives people to work longer hours and inhibits their subsequent ability to detach psychologically after work. This in turn

limits their quality of sleep and their work-related vigor the following morning. Accordingly, calling intensity is proposed to have direct positive and indirect negative effects on morning vigor.

*-Insert Figure 1 about here -*

### Conceptualization of Calling and Calling Intensity

A calling can be conceptualized as a form of work orientation that comprises relatively stable core beliefs about both work and life (Bellah, Madsen, Sullivan, Swidler & Tipton, 1985; Elangovan et al., 2010; Wrzesniewski, 2011). Reviews of the calling literature, however, reveal little consensus about how the concept may be defined (Duffy & Dik, 2013; Elangovan et al., 2010). Typical definitions range from the more secular, for example, a “consuming, meaningful passion towards a domain” (Dobrow & Tosti-Kharas (2011, p.1005), to the neo-classical, which reflects the religious origins of the concept, where a person finds a role that they are “destined to fill by virtue of God-given gifts and talents and the opportunities presented by one’s station in life” (Bunderson & Thompson, 2009, p. 38). Dik and Duffy (2009; Duffy & Dik, 2013) propose that a combination of three elements, an external summons to the work, a sense of great meaning and purpose linked to personal goals, and a prosocial orientation to the work, signifies a calling in the work domain. The nature of callings are not understood to vary on a daily basis but are considered to be relatively stable, at least in the short term (Dobrow, 2013).

The focus of our study is calling intensity, which we suggest reflects the extent to which a calling is itself experienced as a consuming and meaningful passion (Dobrow & Tosti-Kharas, 2011). We believe that this seems particularly relevant for examining calling’s links with

detachment and vigor because the higher the level of the experienced meaningfulness of and passion towards that calling domain, the more engaged an individual is likely to be (Bunderson & Thompson, 2009). Some workers with an occupational calling might be expected to experience that calling very intensely, as a profound and all-encompassing devotion to their work, while others might experience it less strongly, more ambiguously and as a less dominant part of their lives.

### Theoretical Development and Hypotheses

A calling is seen to be a motivating and action-oriented force which provides an individual with both energy and direction (Elangovan et al, 2010). Indeed Dik and Duffy (2009, p. 427) describe callings as “primary sources of motivation” and empirical links have confirmed an association between callings and concepts such as intrinsic motivation (Wrzesniewski, McCauley, Rozin & Schwartz, 1997, 1997), zest for life (Peterson, Park, Hall & Seligman, 2009), and work engagement (Hirschi, 2012), as well as other outcomes including satisfaction with domain (e.g. Hagmaier & Abele, 2012), organizational commitment and lower withdrawal intentions (Duffy, Allan & Dik, 2011). It is important to note, however, that a shortcoming of many of the existing studies of calling is that they rely on cross-sectional data and/or student samples.

Antecedents of work motivation and engagement are often referred to as job resources and theories such as the Conservation of Resources Theory (Hobfoll, 1989) and the Job Demands-Resources Model (Schaufeli & Bakker, 2004) have been widely used to explain how job resources function to help workers overcome job demands and enhance their effectiveness. Hobfoll (1989, p. 516) defines resources as “those objects, personal characteristics, conditions or

energies that are valued by the individual or that serve as a means for attainment of those objects, personal characteristics, conditions or energies”. Typically, the job resources studied have reflected both personal characteristics, such as resilience and self-efficacy, and job characteristics, e.g. feedback and autonomy (Taris & Schaufeli, 2014). Recently, Bickerton, Miner, Dowson and Griffin (2014) have drawn on job resource theories to conceptualise calling as a further job resource and have demonstrated that strong callings, along with other spiritually-based job resources, enhanced the work engagement of religious workers over an 18-month period.

In the present study, we examine the association between calling intensity and work-related vigor, which is characterized as “high levels of energy and mental resilience while working, the willingness to invest effort in one’s work, and persistence even in the face of difficulties” (Schaufeli et al, 2006; p. 702). We argue that, due to their energizing effect as a job resource, a positive outcome of intense callings, compared to weaker callings, will be an experience of greater domain-related vigor at the start of the day. Accordingly we hypothesize that at the between-person level:

*H1: Calling intensity has a positive direct effect on morning work-related vigor.*

In addition to positive outcomes, callings have also been acknowledged to have several problematic effects for individuals. Dobrow & Tosti-Kharas (2011) found that people with intense callings might be seen as having “tunnel vision”, to the extent that they are less receptive to advice from others if it threatens their sense of calling. Bunderson and Thompson (2009) found evidence that people who view their work as a calling often experience it as an intense moral duty and duly suffer costs in relation to other aspects of their lives, feel overworked, and



risk exploitation by their employer. Other researchers have discussed how pursuing a calling might diminish the value of relationships both at work and outside of work (Cardador & Caza, 2012), and could be used as a justification for sacrifices made in the non-work domains (Duffy, Foley, Raque-Bogdan, Reid, Dik, Castano & Adams, 2012a).

One interpretation of these observations is that a calling produces a set of salient superordinate goals that can often be given higher priority over other life goals. Arguably, this focus on calling-related goals can be problematic when the additional goals, which may include both personal and family-related goals, are not given sufficient attention and when they are important for individual functioning. Theoretically, researchers have drawn on the concept of self-regulation failure (see Baumeister, Heatherton & Tice, 1994), to account for instances where individuals fail to disengage attention and effort from one goal and direct them towards another more appropriate goal (e.g. Wrosch, Scheier, Carver and Schulz, 2003). Generally, self-regulation failure refers to situations when individuals' ability breaks down to effectively influence, modify and control their own behaviour, thoughts and emotions (Baumeister & Heatherton, 1996), but a central part of this theory relates to the failure to terminate activities, either because of excessive goal pursuit (Heckhausen & Beckmann, 1990) or a failure to transcend immediate impulses (Baumeister & Heatherton, 1996). It is suggested that this is particularly challenging when the individual is servicing high-priority goals or goals that are core to the self (Carver & Scheier, 1996).

We draw on the above arguments to propose that intense callings make disengagement from work-related activities more difficult and that this is reflected via working long hours and low levels of psychological detachment after work. These assertions further fit with discussions within the calling literature. Firstly, part of Wrzesniewski et al.'s (1997; p.24) description of

someone who views their work as a calling (rather than a job or a career) includes the following: “Mr C’s work is one of the most important parts of his life. He is pleased that he is in this line of work... He tends to take his work home with him and on vacations, too.” So for Wrzesniewski et al, wanting to continue one’s working day for longer and a reluctance to detach from work during ‘non-work’ time is a defining feature of having a calling. Secondly, Duffy and Dik (2013) suggest that a vulnerability of a calling is workaholism, which can often stem from obsessive-compulsive tendencies (Naughton, 1987) and a feeling of compulsion to work (Spence and Robbins, 1992). Similarly, Bunderson and Thompson (2009) identified that individuals can feel a sense of unbending moral duty towards callings. Such normative pressures may make it difficult to resist working on or thinking about a calling whenever possible.

In addition to a direct link between calling intensity and psychological detachment, we propose that calling will also be related to psychological detachment indirectly via its effect on working hours: we suggest that working long hours simply leaves less time for detachment after work. It is also likely that working long hours produces a more intense daily work experience from which it is harder to detach psychologically afterwards. Previous studies have also shown that habitual long work hours and day-specific work hours are negatively related to psychological detachment after work (Sonnentag & Bayer, 2005; Sonnentag, Binnewies & Mojza, 2010). Thus we argue that any increase in working hours attributable to calling will have a subsequent influence on psychological detachment. Therefore, we hypothesize at the between-person level the following:

*H2: Calling intensity has a) a positive direct effect on working hours, b) a negative direct effect on evening psychological detachment and c) a negative indirect effect on evening psychological detachment via increased working hours.*

While research findings are not always consistent, there is a general acceptance that working excessively long hours is problematic for individuals, causing fatigue, stress and work-life conflict in the short-term and poorer health and health-related behavior in the longer-term (Sparks et al, 1997; Major, Klein & Ehrhart, 2002). Recently, there has been interest in gaining a better understanding of how employees recover from their experiences at work. According to the Effort-Recovery Model (Meijman & Mulder, 1998), effort expenditure at work leads to subsequent ‘load reactions’, such as work-related fatigue, as the psycho-physiological system that is mobilised during the production of effort becomes depleted. Following on from our use of self-regulation failure to support Hypothesis 2, we can see how failure to disengage from calling-related activities can be problematic for daily individual recovery. In order for recovery to occur, it is believed that there needs to be psychological detachment from work during time outside of work (Etzion et al., 1998). If recovery does not occur the worker starts the next working period in a suboptimal condition and will have to invest compensatory effort in order to perform adequately. Indeed, feeling recovered, for which psychological detachment is an antecedent, has been linked to varied measures of employee well-being and reduced fatigue (Sonnentag & Bayer, 2005; Sonnentag, Binnewies & Mojza, 2008a), as well as organizationally-important outcomes such as job performance, citizenship, and personal initiative (Binnewies, Sonnentag, & Mojza, 2010).

While the inability to detach from work may be problematic in its own right, it is its role alongside sleep quality that is seen to be crucial within the recovery process and for feeling ready to engage in work the following day (Zijlstra & Sonnentag, 2006). Poor sleep quality has been linked to reduced performance across a range of tasks (e.g. Dinges, Pack, Williams, Gillen, Powell, Ott, Aptowicz & Pack, 1997) and long-term health problems (e.g. Spiegel, Leproult & Van Cauter, 1999). Studies of sleep quality have considered multiple indicators, including sleep duration, time taken to fall asleep, awakenings during the night, restfulness after waking and general satisfaction with sleep (e.g. Buysse, Reynolds, Monk, Berman & Kupfer, 1989). Our approach, which is consistent with others studying work-related recovery experiences (e.g. Sonnentag et al, 2008a), focuses on a daily subjective self-evaluation of sleep quality the previous night. Ultimately, we are interested in better understanding the pathways between calling intensity and morning vigor that incorporate recovery concepts, including sleep quality. In order to examine this process, firstly we need to consider the within-person associations between daily work-hours, psychological detachment, sleep quality and morning vigor.

In our model, sleep quality is located as an outcome of lower daily work hours and higher psychological detachment. Above we argue why, at the between-person level, people who work long hours compared to short hours are less able to detach psychologically from work in the evening. We argue that the same logic holds at the within-person level too: when a person works longer hours than they usually do, they will be less able than usual to detach psychologically. In turn, when they are less able to detach psychologically than usual in the evening, it is likely that their subsequent sleep quality will be lower. This view is supported by Zijlstra and Sonnentag (2006, p.134), who suggest that being unable to “unwind” and “switch off” from one’s working day will then reduce sleep quality, as well as Sonnentag and Fritz (2007) and Sonnentag et al

(2008a), who found that detachment is positively correlated with sleep quality. One explanation for poorer sleep quality is that being unable to detach psychologically from work makes it more likely that negative events and emotions experienced during the day will adversely influence night-time cognitive and affective processes (Querstret & Cropley, 2012).

Furthermore, we expect that these within-person processes will have a subsequent effect on morning vigor. In our model, morning vigor is an outcome of the sequential relations between daily work hours and psychological detachment. The model further proposes that the impact of psychological detachment on morning vigor will be partly mediated by sleep quality. We argue that, as related but distinct aspects of the recovery processes, being less able than usual to detach psychologically and experiencing poorer sleep than usual will both uniquely reduce individuals' morning vigor, as depleted personal resources will not have been replenished to the same degree as normal and the individual will be more fatigued than on other days. Such assertions are supported by studies of work-related recovery, in particular the positive associations that have been found between psychological detachment and work engagement, of which vigor is a dimension (e.g. Sonnentag, Binnewies, Mojza & Scholl, 2008b; Kühnel, Sonnentag & Westman, 2009), sleep quality and reports of vigor (e.g. Pilcher & Ott, 1998) and psychological detachment/sleep quality and subsequent morning affect (Sonnentag et al, 2008a).

We therefore propose the following multi-part hypothesis at the within-person level:

*H3: At a daily level, longer daily working hours are: a) indirectly related to poorer sleep quality via lower evening psychological detachment, and b) indirectly related to morning work-related vigor via lower evening psychological detachment uniquely and c) via both lower evening psychological detachment and poorer sleep quality in serial.*

Finally, we consider the indirect effects from calling intensity to both sleep quality and morning vigor. Above we have developed a theoretical framework that integrates propositions derived from self-regulation failure and the Effort-Recovery model and reviewed findings from a large number of empirical studies. We have argued that people with intense callings are likely to work longer hours than people with less intense callings and also that they are less likely to detach psychologically after work. We also suggest that, at the within-person level, lower psychological detachment is subsequently associated with poorer sleep quality and lower morning vigor. We propose that these associations will also be found at the between-person level, that is, people who generally work longer hours, detach less and sleep less well will feel less vigorous in the morning than other people. Putting these arguments together, we argue that calling intensity has negative effects on both sleep quality and morning vigor that are transmitted by its effects on work hours and psychological detachment.

We therefore propose the following multi-part hypothesis at the between-person level:

*H4: Calling intensity has a negative indirect effect on a) sleep quality via greater working hours and lower evening psychological detachment and b) morning work related vigor via greater working hours and lower evening psychological detachment and c) additionally via poorer sleep quality.*

## **Methodology**

### **Procedure and Sample**

Participants in this study were Church of England ministers. Church ministers are a suitable population within which to study calling as calling is a defining feature of this occupation: church ministers' calling is objectively verified in that they cannot train to become priests unless their vocation to ordained ministry has been confirmed during a selection process. Religious workers, while featuring in a number of recent studies (e.g. Bickerton et al, 2014), have received little attention to date in studies of work and organizational psychology. This is surprising, given their influential role in local and national society in most Western countries. The roles of church ministers also share characteristics with many other occupations, including the management of others, team-working, having administrative and legal responsibilities, attending and chairing meetings, public speaking, and having accountability for performance standards.

A sample of 900 incumbent ministers was randomly selected from a national database, but stratified to include equal proportions of males and females and to include equal proportions of ministers who were responsible, singly and in teams, for a single and multiple churches. Thirty-five individuals had asked not to be contacted for research purposes. The remaining 865 were invited to complete an online background survey and seven consecutive online daily diaries. The date of the first diary was randomly selected for each person during the month after the background survey. Diary surveys were sent daily via email at 3pm and participants were instructed to complete them once they had completed their work for the day. Participants were asked to complete a diary, even if a day was intended as a "day off".

The analyses reported here are conducted on the data provided by 193 participants who completed the background survey and more than one diary survey (184 people responded on at least six days). This reflects a 22.3% response rate, however as many of the email addresses were known to be out of date and we learned that many 'non-responders' were ineligible to participate

(i.e. were away from their post at the time, they had retired), this response rate is likely to be an underestimate. True days off, on which less than an hour's work was conducted, were removed from the dataset, leaving a total of 1000 days on which the analyses were conducted.

Participants were mostly women (59.1%), between the age of 50 and 59 years (57.0%), ethnic white-British (92.7%), and married or in long term relationships (79.8%). 39.4% had dependent children or other relatives. The majority had full-time posts (95.3%), were responsible for multiple churches (64.7%) and worked in some form of team context (78.8%). The location of roles varied across urban (17.1%), suburban or small town (30.5%) and rural or coastal settings (52.4%). The sample has a higher proportion of women than the national clergy population, but is otherwise very similar in terms of demographic profile. Data were collected in England in 2013.

### Measures

*Calling Intensity* was measured in the background survey using four items from Dobrow and Tosti-Kharas' (2011) original scale. Items were selected that best operationalized calling intensity for the given population. These were "My existence would be much less meaningful without my involvement in *ministry*", "The first thing I often think about when I describe myself to others is that I'm a *minister*", "*Ministry* is always in my mind in some way", and "I enjoy *ministry* more than anything else" and were measured on a 5-point Likert-type scale where 1 = strongly disagree and 5 = strongly agree. The alpha for this measure was 0.70.

*Daily work hours* were calculated for each day using data from the daily diary. Each day, participants were asked to indicate on a 24-hour grid the activities they had engaged in and at what time. Columns of the grid referred to 14 activities that form a typical day for an incumbent



minister. The grid was developed from pilot work involving the study of organizational documents relating to role content and interviews with both senior ministers and staff responsible for the development of ministers. The activities included preaching and teaching, participation in prayer, liturgical duties, pastoral work, conducting occasional offices, leadership within the local community, administration, communicating via social media, offering hospitality and outreach, and working with young people. In addition, three further activities were included and could be selected: 'Travelling', 'Taking a break', 'Other activity'. Each row of the grid referred to an hour period of the day and participants were able to report more than one activity in each hour period. Daily work hours were calculated by summing the number of hours for which an activity (or activities) was entered in the grid, with the exception of 'Taking a break'.

*Psychological detachment* was measured using three items adapted from Sonnentag and Fritz's (2007) measure and presented first in the diary: "Reflecting on the period at the end of the day yesterday, to what extent were you able to do the following", followed by "Mentally detach from the tasks of ministry", "Not to think about the tasks of ministry", and "Distance yourself from the tasks of ministry". They were measured on a 5-point Likert-type scale where 1 = not at all and 5 = a great deal. The alphas ranged from .93 to .97 over the seven diary days (mean = .95).

*Sleep quality* was measured using a single item adapted from the Pittsburgh Sleep Quality Index (Buysse et al, 1989). This asked "How would you rate the quality of your sleep last night?" with a 5-point response scale where 1 = very poor and 5 = very good.

*Morning vigor* was measured using three items adapted from the UWES (Schaufeli et al, 2006) that followed the detachment and sleep quality measures each day. Respondents were asked "After you had woken up this morning, to what extent did you feel the following" with

three items presented next: “Bursting with energy”, “Strong and vigorous” and “Ready to engage in ministry”. They were measured on a 5-point Likert-type scale where 1 = not at all and 5 = a great deal. The alphas ranged from .75 to .87 over the seven diary days (mean = .83).

### *Data analysis*

Diary data have a multilevel structure with repeated measurements nested within individuals, allowing for both a between- and within-person level of analysis of covariance. The hypotheses were tested using multi-level structural equation modelling (MSEM) within Mplus 7 (Muthén & Muthén, 1998-2012). This technique partitions the variance of the diary variables measured into between- and within-person latent components.

Prior to these analyses, the intraclass correlations were checked for the diary items to ensure that an appropriate amount of variance in each of the study variables existed at both levels. For each variable, substantial variance was accounted for by between- and within-person variations: work hours (between = 85%; within = 15%), psychological detachment items (between = 57% - 62%; within = 38% - 43%), sleep quality (between = 62%; within = 38%), morning vigor items (between = 36% - 52%; within = 48% - 64%). This is important considering that hypotheses were tested at both of these levels of analysis.

To establish correct temporal order, the measures of psychological detachment, sleep quality and morning vigor were lagged, i.e. taken from the diary the day following the measure of work hours. The direct effects between calling intensity and morning vigor, work hours and psychological detachment articulated in Hypotheses 1, 2a and 2b were tested initially in a non-mediation MSEM model (i.e. a model in which only direct paths between calling intensity and the outcome variables were specified) at the between-person level. To examine our 2-1-1-1-1

multi-level mediation SEM model (as per Figure 1) and test direct and indirect effects simultaneously, we followed the advice of Preacher, Zyphur and Zhang (2010) and Preacher, Zhang and Zyphur (2011). To obtain more accurate confidence interval (CI) estimates of the indirect effects we used Monte Carlo estimates (MacKinnon, Lockwood & Williams, 2004), calculated using the R-based programmer developed by Selig and Preacher (2008). Paths between the study variables were modeled using robust maximum likelihood method of estimation. Multi-item measures were examined as latent variables. Several control variables were also included in the models. At the within-person level we controlled for day of the week to account for day of the week effects (MacFarlane, Martin & Williams, 1988), and days that were intended to be a “day off” from ministry. At the between level we controlled for age and gender, as both have been found to have mixed effects in previous calling research (e.g. Dobrow & Tosti-Kharas, 2011) and trait negative affect (2-items from Stokes and Levin, 1990;  $\alpha = .60$ ) to rule out a simple interpretation of the findings on the basis of affectivity.

Because our model contains both a positive direct effect between calling intensity and morning vigor (H1) and a negative indirect effect between these variables via the proposed mediators (H4), the full mediation model can be considered an inconsistent mediation model (Davis, 1985), defined as a model in which the indirect effect has the opposite sign to the direct effect. MacKinnon, Krull and Lockwood (2000) suggest that the indirect effects in such models should be referred to as suppression effects<sup>1</sup>, as an implication of accounting for the indirect

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<sup>1</sup> Conger (1974, pp. 36-7) defines a suppressor variable as “a variable which increases the predictive validity of another variable (or set of variables) by its inclusion in a regression equation”. Statistically inconsistent mediation, negative confounding and suppression are equivalent and so interpretation is dependent upon the conceptual framework (MacKinnon et al 2000). The distinction between mediation and confounding thus involves the directionality and causal nature of the relationships in the model. In our model, the temporal precedence of the variables dictates the direction of the relationships. Inconsistent mediation has also featured in

effect in the model is an increase in the size of the estimated direct effect. They also note that if the magnitude of the direct effect and the indirect effect in such models are similar, but in opposite directions, the total effect may be close to zero. Therefore consistent with recent approaches to mediation (e.g. Shrout & Bolger, 2002; Preacher & Hayes, 2008), our approach to mediation does not require a significant direct effect between the IV and the DV in the absence of the mediator.

The study variables were grand mean centered prior to analysis. When variables are modeled at both between and within levels within Mplus, the latent within component of the variables is centered to the group mean by default. Accordingly, our results can be interpreted as follows: in the within-person part of the model, a positive relationship between an  $x$  and a  $y$  variable indicates that on days when a respondent reports levels of  $x$  higher than they did on average over the seven days, they report higher levels of  $y$ . In the between-person part of the model, a positive relationship between  $x$  and  $y$  means that when a respondent's average level of  $x$  over the seven days is higher than the sample's average level of  $x$ , they report higher levels of  $y$ .

## **Results**

A measurement model for the theoretical model was tested in a multi-level confirmatory factor analysis, which specified the three multi-item measures as latent constructs (calling intensity, psychological detachment and morning vigor) and the two single-item variables as observed variables (work hours and sleep quality). This model fitted the data well ( $\chi^2 = 109.868$ ,  $df = 62$ ; CFI = .99; TLI = .99; RMSEA = .020; sRMR = .020(within) and .070(between)) and better than

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earlier recovery studies, with psychological detachment at the weekend being found to mediate the relationship between job involvement and change in work engagement after the weekend (Kühnel et al, 2009).

a null model in which all items were loaded onto a single factor ( $\chi^2 = 1842.290$ ,  $df = 74$ ; CFI = .66; TLI = .57; RMSEA = .110; sRMR = .167(within) and .169(between)). The fit indices further supported the fit of the MSEM used to test the hypotheses (now including control variables and hypothesized structural paths only) to the data ( $\chi^2 = 194.986$ ,  $df = 119$ ; CFI = .99; TLI = .98; RMSEA = .018; sRMR = .013(within) and .065(between))<sup>2</sup>. Means, standard deviations and zero-order correlations are presented in Table 1 and the multi-level path estimates are presented in Table 2.

*- Insert Tables 1 & 2 about here -*

In the non-mediated between-person model, in which only the effects of the controlled variables are included in addition to the direct relationships between calling intensity and outcomes, a non-significant direct effect is observed between calling intensity and morning vigor ( $b = .074$ ,  $p = .418$ ). However, when the influence of the hypothesized mediators is included as per our theoretical framework in the MSEM, the positive association between calling intensity

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<sup>2</sup> This model included a path at the within-person level between the variable representing “day off” and one of the vigor items: “Ready to engage in ministry”. It makes sense that these two variables should be negatively related, considering that days off are intended to be days free from ministry. It could be that working on ‘days off’ is often initially unanticipated earlier in the day and also that people’s mood and motivational regulation differs on days off compared to work days (e.g. Ryan, Bernstein & Brown, 2010). We considered removing “days off” from the dataset, but believe that it is important to retain them considering that most clergy do engage in ministry on their “day off” and also because of our focus on recovery, for which “days off” are likely to be important. Similarly we considered removing the vigor item from the dataset, but felt that it was more important to retain the original three items from the scale and maintain the measure’s reliability. The fit of an alternative model that did not include this path remained broadly acceptable ( $\chi^2 = 672.848$ ,  $df = 120$ ; CFI = .90; TLI = .85; RMSEA = .048; sRMR = .051(within) and .065(between)) and any changes to the structural estimates in this alternative model, compared to those presented, are negligible.

and morning vigor strengthens and becomes significant ( $b = .174, p < .001$ ). This latter model can be considered an inconsistent mediation model and the increase in effect size represents a suppression effect (MacKinnon et al, 2000), which is indicative of the contrasting causal pathways between the variables. This is consistent with our theoretical model that there are positive and negative pathways between calling intensity and morning vigor<sup>3</sup>. We conclude support for Hypothesis 1.

The findings further identify significant between-person associations in the hypothesized directions within the non-mediation model between calling intensity and work hours ( $b = .847, p = .004$ ) and evening psychological detachment ( $b = -.258, p = .014$ ). This indicates that individuals with a more intense calling are more likely to work longer hours each day than individuals with less intense callings and that they are more likely to report lower levels of evening psychological detachment. Therefore Hypotheses 2a and 2b are supported.

Estimates within the MSEM further indicate a significant negative direct effect of work hours on psychological detachment at both the between- ( $b = -.105, p = .006$ ) and within-person level ( $b = -.059, p < .001$ ). This suggests both that individuals who work longer hours report less psychological detachment in the evening than individuals who work fewer hours and also that

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<sup>3</sup> Further analysis, in which each of the three mediators were examined independently, revealed that this suppression effect was caused mainly by psychological detachment. The relationship between calling intensity and vigor became significant ( $p < .05$ ) in a single mediator model in which psychological detachment was included (Model Z); this was not the case for single mediator models involving either work hours or sleep quality. This further analysis also rules out multicollinearity between mediators as a cause of the suppression effect. A version of Model Z was also run to examine whether common method effects could account for the suppression, due to the mediator and dependent variable being measured at the same time. In this model the positions of vigor and psychological detachment were switched - if common method effects were responsible for the suppression effect, one would expect to find similar suppression effects in this model. As no similar suppression effect was observed in the relationship between calling intensity and psychological detachment when vigor was controlled for, this explanation was ruled out. Further details of these analyses are available on request from the author.

individuals are less likely to detach psychologically during an evening when they work longer hours that day than they do usually. At the between-person level, a significant indirect effect (as indicated by the Monte Carlo CIs not containing a zero) is identified from calling intensity to evening psychological detachment via work hours, thus supporting Hypothesis 2c.

Further significant associations were found at the within-person level. Psychological detachment is positively related to both sleep quality ( $b = .373, p < .001$ ) and morning vigor ( $b = .101, p = .001$ ) and sleep quality is positively related to morning vigor ( $b = .338, p < .001$ ). This suggests that when people detach more than they do normally, they experience greater sleep quality and morning vigor and that when people experience greater sleep quality than usual, they also experience greater morning vigor. Support then followed for the hypothesized within-person indirect effects linked to these associations (as indicated by the Monte Carlo CIs not containing a zero). This indicates that working longer hours than usual is related to poorer sleep quality because of reduced psychological detachment (Hypothesis 3a) and that it is related to lower morning vigor because of both reduced psychological detachment uniquely (Hypothesis 3b) and reduced sleep quality (Hypothesis 3c).

Lastly, these within-person direct effects were replicated at the between-person level. Psychological detachment is positively related to both sleep quality ( $b = .430, p < .001$ ) and morning vigor ( $b = .368, p < .001$ ) and sleep quality is positively related to morning vigor ( $b = .319, p < .001$ ). This suggests that people who detach psychologically more than others also experience greater sleep quality and morning vigor on average and that people who experience greater sleep quality than others experience greater morning vigor.

Support then followed for the hypothesized between-person indirect effects between calling intensity and both sleep quality and morning vigor (as indicated by the Monte Carlo CIs

not containing a zero). These findings suggest that people with more intense callings can experience poorer sleep quality because they work longer hours and detach to a lesser degree than people with less intense callings (Hypothesis 4a). Similarly, people with more intense callings can also experience lower morning vigor as a result of working longer hours and detaching to a lesser degree (Hypothesis 4b), and sleeping less well (Hypothesis 4c).

## **Discussion**

Answering calls in the literature for more research into the “dark side” of callings (e.g. Dobrow & Tosti-Kharas, 2011; Duffy & Dik, 2013; Elangovan, et al, 2010), this study tested an inconsistent multiple-mediation model accounting for both positive and negative effects of intense callings on work-related morning vigor. The model proposed that people with intense callings are, on the one hand, more energised towards their calling domain than people with less intense callings. Yet at the same time, the model proposed that people with intense callings can struggle to disengage both physically, by working longer hours, and psychologically from their calling after work compared with people with less intense callings. This, in turn, reduces sleep quality and contributes to a negative effect on morning vigor. Drawing on data collected via a survey and diary study of church ministers, the hypotheses specifying the opposing between-person direct and indirect effects described in the model received full support. More specifically, the mediators acted as suppressor variables, and only once their negative indirect effect was accounted for was a positive relationship between calling intensity and morning vigor observed. This study therefore extends understanding of the work-related experiences of individuals who choose to follow their calling and the implications of doing so for their work-related health.



## Theoretical Contributions

This study makes three main contributions to the calling literature. Firstly, the study has expanded the nomological network of callings by demonstrating their associations with novel outcomes via a robust methodology. In particular, the study demonstrates associations between intense callings and longer working hours and reduced psychological detachment in the evenings, which to our knowledge have not previously been hypothesized or demonstrated. It is perhaps not surprising that people with intense callings push themselves to work longer each day, considering that callings relate to people's passions: it follows that people are likely to engage in for longer what they enjoy doing or see as important (Sturges, 2013). This is not a bad thing in itself and may even enhance satisfaction and productivity in the short-term. However, there are costs associated with habitually working long hours, in terms of psychological and physical well-being (e.g. Sparks et al, 1997), and if this subsequently leads to fatigue then one might also expect a greater risk of impaired performance and risk-related behaviors (Spurgeon, Harrington & Cooper, 1997).

The potential costs arising from the longer work hours associated with intense callings may be further compounded because of the link found here between calling intensity and lower psychological detachment after work. Both direct and indirect effects were found between calling intensity and psychological detachment, indicating that lower psychological detachment may be attributed both directly to greater intensity of a calling and via longer working hours. According to Effort-Recovery Theory (Meijman & Mulder, 1998), working long hours is likely to involve a depletion of personal resources that requires subsequent replenishment. Findings from studies of recovery have found that lower psychological detachment from work is linked to greater daily fatigue (Sonnetag & Bayer, 2005) and reduced task performance, personal

initiative and citizenship (Binnewies et al, 2010), which are also noted above as potential risks of intense callings in relation to longer working hours. We have argued that the combined influence of calling intensity on long work hours combined with limited detachment is an example of self-regulation failure (Baumeister & Heatherton, 1996). Further research would need to examine whether the effects of calling extend to affect fatigue and work-related behavior in this way, but the present study has at the very least introduced the idea that intense callings are linked to a greater propensity to engage in work for longer each day and a reduced ability to subsequently disengage once work for the day is done. Put simply, callings appear to be difficult to “hang up”.

It is also worth noting how the study’s methodology supports this contribution. With the exception of calling intensity, the variables in the current study were collected daily via a diary over the course of a week. This has allowed for the influence of calling to be examined in relation to concepts that are potentially more grounded in life as it is lived, as opposed to more global, evaluative and abstract perceptions or attitudes (e.g. such as life satisfaction). In addition, only a handful of quantitative studies of calling to date have moved beyond either cross-sectional methodologies or a reliance on student samples (e.g. Dobrow & Tosti-Kharas, 2011; Dobrow, 2013). The present study’s focus on a working population when the measurement of calling intensity and the outcomes has also been temporally separated therefore strengthens the first contribution in expanding calling’s nomological network.

The second contribution relates to the meditation model developed in the present study. Mediation models allow associations to be decomposed into components so that possible causal mechanisms can be revealed and theoretical explanations developed (MacKinnon et al, 2000; Shrout & Bolger, 2002). Several mediation models have been presented that account for the association between calling and more positive outcomes. For example, Duffy, Bott, Allan,

Torrey and Dik (2012) found that work meaning and career commitment mediated the relationship between perceiving a calling and job satisfaction. However, while previous studies have documented links between callings and its “dark sides” (e.g. Bunderson & Thompson, 2009; Cardador & Caza, 2012), this study is the first to our knowledge to present either theory or evidence of mediators that account for calling’s more negative effects.

The mediation process identified here involves calling intensity’s influence on both work hours and psychological detachment, which have been discussed above. In addition, reduced sleep quality was also found to be part of this explanatory mechanism. Evidence was found at the within-person level that reduced sleep quality followed longer work hours and lower psychological detachment. More importantly in the context of the present study, reduced sleep quality was found to form part of the chain of indirect effects from calling intensity to morning vigor. Together, psychological detachment and sleep quality are discussed as important parts of the recovery process that help people regain the resources needed for full functioning on subsequent days (Meijman & Mulder, 1998; Zijlstra & Sonnentag, 2006). That both of these variables are found to operate as mediators strengthens the assertion that an important mechanism underlying calling intensity’s negative influence on outcomes such as work-related vigor is the disruption of the recovery process from day-to-day. We therefore believe that this study provides a compelling explanation of why sustaining energy for an intense calling may be difficult in the long-term, at least without incurring significant costs for individuals.

The third contribution of this study is the presentation of systematic evidence of calling as a “double-edged sword” via a dual path model. Bunderson and Thompson (2009) were among the first to use this description of calling, drawing on findings from their study in which people with intense callings reported both positive and negative aspects of their work. However

the present study perhaps goes further by showing how calling intensity can have concurrent positive and negative influences on the same outcome variable, but via different pathways. In questioning the necessity of an initial bivariate relationship between independent and dependent variables within mediation models, Shrout and Bolger (2002, p.431) raise the possibility that “the bivariate effect of  $X \rightarrow Y$  obscures the complexity of the causal relations between these variables”. In the present study, given the non-significant bivariate correlation between calling intensity and morning vigour and in the non-mediation MSEM (see Tables 1 & 2), this point is particularly apt. The partitioning of direct and indirect effects between calling intensity and morning vigor revealed a more complex and theoretically rich set of relations between the two variables, rendering the bivariate association superficial. Accordingly, we can observe an interplay and tension between competing forces, which demand a rather more nuanced understanding of the effects of calling.

### Study Limitations

While this study has strengths, it is not without limitations. Firstly, respondents were surveyed only once a day, which means that reports of evening psychological detachment, night-time sleep quality and morning vigor were measured many hours after the object occurred. Measures may be more reliable if temporally closer to the object in question, as the risk of recall bias is lower (Dex, 1995). Yet we hold that accurately recalling events and experiences within the previous 24 hours is also likely, particularly when questions relate to the most recent episode of that event, because they may suffer less from recency and peak-end effects which are commonly cited causes of recall bias (e.g. Bolger, Davis & Rafaeli, 2003). Collecting data just once a day also avoids respondent overload, which should assist the reliability of measures (Reis & Gable,

2000). Secondly, as psychological detachment, sleep quality and morning vigor were measured in the same daily survey, their associations, while based on within-person variance, remain cross-sectional. Therefore assertions of temporal order or causation for the inter-relations between those variables are limited (Podsakoff, MacKenzie, Lee & Podsakoff, 2003). However the measures of calling intensity and work hours were separated temporarily from each other and from the other variables, so stronger inferences can be made for the inter-relations between those variables. It is recommended that future work try to overcome these two limitations by performing a more time-sensitive test of the mediation. Thirdly, the study examined only part of the recovery process: it could also have examined other aspects of it, such as relaxation, mastery and control (Sonnentag & Fritz, 2007), or even looked at potentially beneficial aspects of not detaching psychologically in the evening, such as problem-solving pondering (Cropley & Zijlstra, 2011). This would have provided a more complete examination of the role of calling in the recovery process. Fourthly, the study could have examined mediators of the positive pathway between calling intensity and morning vigor to test a more complete and balanced model.

### Suggestions for Future Research

There are at least three further research areas that could build on the current study's findings. Firstly, an important issue is the extent to which people with intense callings *choose* to remain engaged for longer in their work (and disengage to a lesser degree) than people with less intense callings. It is widely understood that engaging in activities out of choice is likely to lead to more positive experiences than if motivated by more external mechanisms (Deci & Ryan, 1998). However, work on calling presents a mixed picture regarding whether callings are aligned with intrinsic motivation and volition (Elangovan et al, 2010) or whether callings can also involve

normative or externally regulated processes, such as a sense of duty and anxiety (Bunderson & Thompson, 2009). As mentioned in the introduction, workaholism has been raised as a risk factor for people with callings (Duffy & Dik, 2013). Therefore an aspect of theory development in the future relates to the role of volition and internal regulation in calling-related behaviors.

Secondly, this study did not examine moderators. It would be highly appropriate for future work to develop theoretical propositions regarding factors that may strengthen the beneficial impact of callings and weaken the more deleterious effects. We might speculate that mindfulness, a state of non-judgemental attentiveness to and awareness of moment-to-moment experiences (Brown & Ryan, 2003), could represent a moderator here, facilitating the recovery process (Hülshager, Lang, Depenbrock, Fehrman, Zjilstra & Alberts, 2014). Research studies, perhaps including interventions, could test these propositions. This would help inform practical interventions by career counsellors and/or HR professionals.

A third area of further research is the impact of callings on others who share relationships with the individual “called”. It may be that people with intense callings are not always aware of the impact of their calling on people around them due to “tunnel vision” (Dobrow & Tosti-Kharas, 2011). At work, this may include colleagues, supervisors or employees. It may also involve an impact of callings on “end-users” of the work of the individual who is called, be they patients, students, customers or some other recipient. To date, we simply do not know whether people positively respond to working with or being served by others with intense callings. Our findings relating to long working hours and difficulty detaching from work, as well as the findings elsewhere relating to other non-work difficulties associated with callings (Cardador & Caza, 2012; Duffy et al, 2012a) and self-regulation failure more generally (Vohs & Baumeister, 2011), suggest that family members may experience significant costs of living with someone

with an intense calling. Therefore, there remains a broad range of stakeholders in callings whose voices have yet to be heard in full. Recent research on creative workers has found resource allocation theory (Hobfoll, 2002) to be a useful framework for examining similar spill-over and cross-over effects (Harrison & Wagner, 2015).

### Conclusion

This study has shed light on how callings may often be challenging for an individual, demanding more of them than perhaps less meaningful and consuming endeavors. This is not to deny the many positive correlates of callings for individuals experiencing them. Indeed, it may be that overall the ups outweigh the downs, at least for the individual called. In terms of morning vigor, this study showed how the benefits of intense callings were essentially nullified by the costs. In the development of theory and practice in this area it is important that researchers identify the impact of features of calling on a broad spectrum of outcomes, uncovering valid explanations for any association, and offer strategies for how the benefits of calling may best be exploited.

## References

- Baumeister, R. F., & Heatherton, T. F. (1996). Self-regulation failure: An overview. *Psychological inquiry*, 7(1), 1-15. DOI:10.1207/s15327965pli0701\_1
- Baumeister, R. F., Heatherton, T. F., & Tice, D. M. (1994). *Losing control: How and why people fail at self-regulation*. San Diego, CA: Academic Press.
- Bellah, R., Madsen, R., Sullivan, W., Swidler, A., & Tipton, S. (1985). *Habits of the heart: individualism and commitment in American life*. New York: Harper and Row.
- Bickerton, G. R., Miner, M. H., Dowson, M., & Griffin, B. (2014). Spiritual resources and work engagement among religious workers: A three-wave longitudinal study. *Journal of Occupational and Organizational Psychology*, 87, 370-391. doi: 10.1111/joop.12052
- Binnewies, C., Sonnentag, S., & Mojza, E. (2010). Recovery during the weekend and fluctuations in weekly job performance: A week-level study examining intra-individual relationships. *Journal of Occupational and Organizational Psychology*, 83, 419-441. doi: 10.1348/096317909X418049
- Bolger, N., Davis, A., & Rafaeli, E. (2003). Diary methods: Capturing life as it is lived. *Annual Review of Psychology*, 54(1), 579-616.
- Brown, K. W., & Ryan, R. M. (2004). Perils and promises in defining and measuring mindfulness: Observations from experience. *Clinical Psychology: Science and Practice*, 11, 242-248. doi:10.1093/clipsy.bph078
- Bunderson, J. S., & Thompson, J. A. (2009). The call of the wild: Zookeepers, callings, and the double-edged sword of deeply meaningful work. *Administrative Science Quarterly*, 54, 32-57. doi: 10.2189/asqu.2009.54.1.32



- Buyse, D. J., Reynolds, C. F., Monk, T. H., Berman, S. R., & Kupfer, D. J. (1989). The Pittsburgh sleep quality index: A new instrument for psychiatric practice and research. *Psychiatric Research, 28*, 193-213. doi: [http://dx.doi.org/10.1016/0165-1781\(89\)90047-4](http://dx.doi.org/10.1016/0165-1781(89)90047-4)
- Cardador, M. T., & Caza, B. B. (2012). Relational and identity perspectives on healthy versus unhealthy pursuit of callings. *Journal of Career Assessment, 20*, 338-353. doi: 10.1177/1069072711436162
- Carver, C. S., & Scheier, M. F. (1996). Self-regulation and its failures. *Psychological Inquiry, 7*, 32-40. DOI:10.1207/s15327965pli0701\_6
- Conger, A. J. (1974). A revised definition for suppressor variables: A guide to their identification and interpretation. *Educational & Psychological Measurement, 34*, 35-46. doi: 10.1177/001316447403400105
- Cropley, M., & Zijlstra, F. (2011). Work & rumination. In J. Langan-Fox, & C. L. Cooper (Eds.), *Handbook of Stress in the Occupations* (pp. 487-502). Cheltenham, UK: Edward Elgar.
- Davis, J. A. (1985). *The logic of causal order*. Thousand Oaks, CA: Sage.
- Demerouti, E., Bakker, A. B., Sonnentag, S., & Fullagar, C. (2012). Work-related flow and energy at work and at home: A study on the role of daily recovery. *Journal of Organizational Behavior, 33*, 276-295. doi: 10.1002/job.760
- Dex, S. (1995). The reliability of recall data: a literature review. *Bulletin de Methodologie Sociologique, 49*, 58-89. doi: 10.1177/075910639504900105
- Dik, B. J., & Duffy, R. D. (2009). Calling and vocation at work definitions and prospects for research and practice. *The Counseling Psychologist, 37*, 424-450. doi: 10.1177/0011000008316430

- Dinges, D. F., Pack, F., Williams, K., Gillen, K. A., Powell, J. W., Ott, G. E., Aptowicz, C., & Pack, A. I. (1997). Cumulative sleepiness, mood disturbance and psychomotor vigilance performance decrements during a week of sleep restricted to 4-5 hours per night. *Sleep: Journal of Sleep Research and Sleep Medicine*, 20, 267-277.
- Dobrow, S. R. (2013). Dynamics of calling: A longitudinal study of musicians. *Journal of Organizational Behavior*, 34, 431-452. doi: 10.1002/job.1808
- Dobrow, S. R., & Tosti-Kharas, J. (2011). Calling: The development of a scale measure. *Personnel Psychology*, 64, 1001-1049. doi: 10.1111/j.1744-6570.2011.01234.x
- Duffy, R. D., Allan, B. A., & Dik, B. J. (2011). The presence of a calling and academic satisfaction: Exploring potential mediators. *Journal of Vocational Behavior*, 79, 74-80. doi:10.1016/j.jvb.2010.11.001
- Duffy, R. D., & Dik, B. J. (2013). Research of calling: What have we learned and where are we going? *Journal of Vocational Behavior*, 83, 428-436. doi:10.1016/j.jvb.2013.06.006
- Duffy, R. D., Allan, B. A., Autin, K. L., & Bott, E. M. (2013). Calling and life satisfaction: It's not about having it, it's about living it. *Journal of Counseling Psychology*, 60, 42-52. <http://dx.doi.org/10.1037/a0030635>
- Duffy, R. D., Foley, P. F., Raque-Bodgan, T. L., Reid-Marks, L., Dik, B. J., Castano, M. C., & Adams, C. M. (2012a). Counseling psychologists who view their careers as a calling: A qualitative study. *Journal of Career Assessment*, 20, 293-308. doi: 10.1177/1069072711436145
- Duffy, R. D., Bott, E. M., Allan, B. A., Torrey, C. L. & Dik, B. J. (2012b). Perceiving a calling, living a calling, and job satisfaction: Testing a moderated, multiple mediator model. *Journal of Counseling Psychology*, 59, 50-59. <http://dx.doi.org/10.1037/a0026129>

- Elangovan, A. R., Pinder, C. C., & McLean, M. (2010). Callings and organizational behavior. *Journal of Vocational Behavior, 76*, 428-440. doi:10.1016/j.jvb.2009.10.009
- Etzion, D., Eden, D., & Lapidot, Y. (1998). Relief from job stressors and burnout: reserve service as a respite. *Journal of Applied Psychology, 83*, 577.  
<http://dx.doi.org/10.1037/0021-9010.83.4.577>
- Hagmaier, T. & Abele, A. E. (2012). The multidimensionality of calling: Conceptualization, measurement and a bicultural perspective. *Journal of Vocational Behavior, 81*, 39-51.  
doi:10.1016/j.jvb.2012.04.001
- Harrison, S., & Wagner, D. (2015). Spilling outside the box: The effects of individuals' creative behaviors at work on time spent with their spouses at home. *Academy of Management Journal*, Advance online publication doi: 10.5465/amj.2013.0560
- Heckhausen, H., & Beckmann, J. (1990). Intentional action and action slips. *Psychological Review, 97*(1), 36-48. <http://dx.doi.org/10.1037/0033-295X.97.1.36>
- Hirschi, A. (2012). Callings and work engagement: Moderated mediation model of work meaningfulness, occupational identity, and occupational self-efficacy. *Journal of Counseling Psychology, 59*, 479. <http://dx.doi.org/10.1037/a0028949>
- Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist, 44*, 513-524. <http://dx.doi.org/10.1037/0003-066X.44.3.513>
- Hobfoll, S. E. (2002). Social and psychological resources and adaptation. *Review of General Psychology, 6*, 307-324. <http://dx.doi.org/10.1037/1089-2680.6.4.307>
- Hülshager, U. R., Lang, J. W. B., Depenbrock, F., Fehrmann, C., Zijlstra, F. R. H., & Alberts, H. J. E. M. (2014). The power of presence: The role of mindfulness at work for daily levels

- and change trajectories of psychological detachment and sleep quality. *Journal of Applied Psychology*. Advance online publication. <http://dx.doi.org/10.1037/a0037702>
- Kühnel, J., Sonnentag, S., & Westman, M. (2009). Does work engagement increase after a short respite? The role of job involvement as a double-edged sword. *Journal of Occupational and Organizational Psychology*, *82*, 575–594. doi: 10.1348/096317908X349362
- MacKinnon, D. P., Krull, J. L., & Lockwood, C. M. (2000). Equivalence of the mediation, confounding and suppression effect. *Prevention Science*, *1*, 173-181. doi: 10.1023/A:1026595011371
- MacKinnon, D. P., Lockwood, C. M., & Williams, J. (2004). Confidence limits for the indirect effect: Distribution of the product and resampling methods. *Multivariate Behavioral Research*, *39*, 99-128. doi:10.1207/s15327906mbr3901\_4
- Mainemelis, C. (2001). When the muse takes it all: a model for the experience of timelessness in organizations. *Academy of Management Review*, *26*(4): 548-565. doi: 10.5465/AMR.2001.5393891
- Major, V. S., Klein, K. J., & Ehrhart, M. G. (2002). Work time, work interference with family, and psychological distress. *Journal of Applied Psychology*, *87*, 427. <http://dx.doi.org/10.1037/0021-9010.87.3.427>
- McFarlane, J., Martin, C. L., & Williams, T. M. (1988). Mood fluctuations: Women versus men and menstrual versus other cycles. *Psychology of Women Quarterly*, *12*, 201-223. doi: 10.1111/j.1471-6402.1988.tb00937.x
- Meijman, T. F., & Mulder, G. (1998). Psychological aspects of workload. In P. J. D. Drenth, H. Thierry, & C. J. Wolff (Eds.), *Handbook of work and organizational psychology* (Vol. 2, pp. 5–33). Hove, UK: Psychology Press.

- Monk, T. H., Reynolds, C. F., Kupfer, D. J., Buysse, D. J., Coble, P. A., Hayes, A. J., Machen, M. A., Petrie, S. R., & Ritenour, A. M. (1994). The Pittsburg Sleep Diary. *Journal of Sleep Research*, 3, 111-120. DOI: 10.1111/j.1365-2869.1994.tb00114.x
- Muthén, L. K., & Muthén, B. O. (1998-2012). *Mplus User's Guide (7<sup>th</sup> Ed)*. Los Angeles, CA: Muthén & Muthén.
- Naughton, T. J. (1987). A conceptual view of workaholism and implications for career counseling and research. *The Career Development Quarterly*, 35, 180-187.  
doi: 10.1002/j.2161-0045.1987.tb00912.x
- Peterson, C., Park, N., Hall, N., & Seligman, M. E. (2009). Zest and work. *Journal of Organizational Behavior*, 30, 161-172. doi: 10.1002/job.584
- Pilcher, J. J., & Ott, E. S. (1998). The relationships between sleep and measures of health and well-being in college students: A repeated measures approach. *Behavioral Medicine*, 23, 170-178. doi:10.1080/08964289809596373
- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88, 879-903. <http://dx.doi.org/10.1037/0021-9010.88.5.879>
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, 40, 879-891. doi:0.3758/BRM.40.3.879
- Preacher, K. J., Zhang, Z., & Zyphur, M. J. (2011). Alternative methods for assessing mediation in multilevel data: The advantages of multilevel SEM. *Structural Equation Modeling*, 18, 161-182. doi:10.1080/10705511.2011.557329

- Preacher, K. J., Zyphur, M. J., & Zhang, Z. (2010). A general multilevel SEM framework for assessing multilevel mediation. *Psychological Methods, 15*, 209-233.  
<http://dx.doi.org/10.1037/a0020141>
- Querstret, D., & Cropley, M. (2012). Exploring the relationship between work-related rumination, sleep quality, and work-related fatigue. *Journal of Occupational Health Psychology, 17*, 341. <http://dx.doi.org/10.1037/a0028552>
- Reis, H. T., & Gable, S. L. (2000). Event-sampling and other methods for studying everyday experience. In H. T. Reis & Judd, C. M. (eds), *Handbook of Research Methods in Social and Personality Psychology*, University of Cambridge Press, UK (pp. 190-222).
- Ryan, R. M., Bernstein, J. H., & Brown, K. W. (2010). Weekends, work, and well-being: Psychological need satisfactions and day of the week effects on mood, vitality, and physical symptoms. *Journal of Social and Clinical Psychology, 29*(1), 95-122.
- Schaufeli, W. B., & Bakker, A. B. (2004). Job demands, job resources, and their relationship with burnout and engagement: A multi-sample study. *Journal of Organizational Behavior, 25*(3), 293-315. DOI: 10.1002/job.248
- Schaufeli, W. B., Bakker, A. B., & Salanova, M. (2006). The measurement of work engagement with a short questionnaire a cross-national study. *Educational and Psychological Measurement, 66*(4), 701-716. doi: 10.1177/0013164405282471
- Selig, J. P., & Preacher, K. J. (2008, June). *Monte Carlo method for assessing mediation: An interactive tool for creating confidence intervals for indirect effects* [Computer software]. Available from <http://quantpsy.org/>.

- Shrout, P. E. & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods*, 7, 422-445.  
<http://dx.doi.org/10.1037/1082-989X.7.4.422>
- Sonnentag, S. & Fritz, C. (2007). The recovery experience questionnaire: Development and validation of a measure for assessing recuperation and unwinding from work. *Journal of Occupational Health Psychology*, 12, 204-221. <http://dx.doi.org/10.1037/1076-8998.12.3.204>
- Sonnentag, S., & Bayer, U-V. (2005). Switching off mentally: Predictors and consequences of psychological detachment from work during off-job time. *Journal of Occupational Health Psychology*, 4, 393-414. <http://dx.doi.org/10.1037/1076-8998.10.4.393>
- Sonnentag, S., Binnewies, C., & Mojza, E. J. (2008a). "Did you have a nice evening?" A day-level study on recovery experiences, sleep and affect. *Journal of Applied Psychology*, 93, 674-684. <http://dx.doi.org/10.1037/0021-9010.93.3.674>
- Sonnentag, S., Binnewies, C., & Mojza, E. J. (2010). Staying well and engaged when demands are high: The role of psychological detachment. *Journal of Applied Psychology*, 95, 965-976. <http://dx.doi.org/10.1037/a0020032>
- Sonnentag, S., Mojza, E. J., Binnewies, C., & Scholl, A. (2008b). Being engaged at work and detached at home: A week-level study on work engagement, psychological detachment, and affect. *Work and Stress*, 22, 257-276. doi:10.1080/02678370802379440
- Sparks, K., Cooper, C., Fried, Y., & Shirom, A. (1997). The effects of hours of work on health: A meta-analytic review. *Journal of Occupational and Organizational Psychology*, 70, 391-408. doi: 10.1111/j.2044-8325.1997.tb00656.x

- Spence, J. T., & Robbins, A. S. (1992). Workaholism: Definition, measurement, and preliminary results. *Journal of Personality Assessment*, *58*, 160-178.  
doi:10.1207/s15327752jpa5801\_15
- Spiegel, K., Leproult, R., & Van Cauter, E. (1999). Impact of sleep debt on metabolic function. *The Lancet*, *354*, 1435–1443. doi:10.1016/S0140-6736(99)01376-8
- Spurgeon, A., Harrington, J. M., & Cooper, C. L. (1997). Health and safety problems associated with long working hours: a review of the current position. *Occupational and Environmental Medicine*, *54*, 367-375. doi:10.1136/oem.54.6.367
- Stokes, J. P., & Levin, I. M. (1990). The development and validation of a measure of negative affectivity. *Journal of Social Behavior and Personality*, *5*, 173-186.
- Vohs, K. D., & Baumeister, R. F. (Eds.). (2011). *Handbook of self-regulation: Research, theory, and applications* (2nd ed). New York, NY: Guilford.
- Wrosch, C., Scheier, M. F., Carver, C. S., & Schulz, R. (2003). The importance of goal disengagement in adaptive self-regulation: When giving up is beneficial. *Self and Identity*, *2*, 1-20. DOI:10.1080/15298860309021
- Wrzesniewski, A. (2011). Callings., in K. Cameron and G. Spreitzer (eds.) *Handbook of Positive Organizational Scholarship*. New York: Oxford University Press.
- Wrzesniewski, A., McCauley, C., Rozin, P., & Schwartz, B. (1997). Jobs, careers, and callings: People's relations to their work. *Journal of Research in Personality*, *31*, 21-33.  
doi:10.1006/jrpe.1997.2162
- Zijlstra, F. R., & Sonnentag, S. (2006). After work is done: Psychological perspectives on recovery from work. *European Journal of Work and Organizational Psychology*, *15*, 129-138. doi:10.1080/13594320500513855



Table 1: Descriptives and zero-order correlations.

	Mean (Within- person)	SD (Within- person)	1	2	3	4	5
1 Calling Intensity				.27*	-.07 <sup>+</sup>	-.05	.04
2 Daily work hours	9.21	3.98	-		-.45**	-.01	-.06
3 Psychological detachment	2.93	1.06	-	-.62**		.20**	.24**
4 Sleep quality	3.42	0.94	-	-.12	.19**		.20**
5 Morning vigor	2.72	0.91		-.17*	.12**	.20**	
Mean (Between-person)			3.79	9.16	2.92	3.42	2.73
SD (Between-person)			0.76	2.01	0.73	0.65	0.64

Notes: <sup>+</sup> $p < .10$ , \* $p < .05$ , \*\* $p < .01$ ; The between-person correlations are shown above the diagonal and the within-person correlations are shown below the diagonal;  $n_{\text{between}} = 193$ ;  $n_{\text{within}} = 1000$ . For the within-person correlations, daily working hours are for day X; Psychological detachment refers to the evening of day X; Sleep quality refers to the night of day X; Morning vigor refers to the morning of day X+1.

Table 2. Unstandardized estimates of direct and indirect effects

	DWH		PD		SQ		MV		
<i>Between-person direct effects</i>	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	
Calling (Non-mediation model)	.847 (.293)	.004	-.258 (.105)	.014	-.155 (.107)	.150	.074 (.091)	.418	
Calling	.845(.289)	.003	-.131 (.109)	.232	-.094 (.100)	.348	.174 (.085)	<.000	
DWH			-.105 (.038)	.006	.053 (.028)	.061	.035 (.026)	.176	
PD					.430 (.065)	<.000	.368 (.066)	<.000	
SQ							.319 (.086)	<.000	
<i>Between-person indirect effects</i>			Estimate (SE)	LLCI	ULCI		Estimate (SE)	LLCI	ULCI
Calling → DWH → PD			-.089 (.040)	-.193	-.017				
Calling → DWH → PD → SQ							-.038 (.018)	-.086	-.007
Calling → DWH → PD → MV							-.033 (.016)	-.075	-.005
Calling → DWH → PD → SQ → MV							-.012 (.006)	-.031	-.002
<i>Within-person direct effects</i>			Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	
DWH			-.059 (.009)	<.000	.012 (.007)	.087	-.004 (.006)	.464	
PD					.373 (.041)	<.000	.101 (.031)	.001	
SQ							.338 (.036)	<.000	
<i>Within-person indirect effects</i>							Estimate (SE)	LLCI	ULCI
DWH → PD → SQ							-.022 (.004)	-.031	-.014
DWH → PD → MV							-.006 (.002)	-.010	-.002
DWH → PD → SQ → MV							-.008 (.002)	-.012	-.005

Notes: SE=standard error; LLCI=lower level confidence interval; ULCI= Upper level confidence interval; Confidence intervals are calculated using Monte Carlo method for assessing mediation (MacKinnon et al, 2004); Calling=Calling Intensity; DWH=Daily work hours; PD=Psychological detachment; SQ=Sleep quality; MV=Morning vigor; control variables included in models but not presented: age, gender, negative affectivity, day of the week, and “day off”;  $n^{\text{between}} = 193$ ;  $n^{\text{within}} = 1000$ .

Figure 1: Theoretical model

