



## Full length article

# Workers' intrinsic work motivation when job demands are high: The role of need for autonomy and perceived opportunity for blended working



Nico W. Van Yperen\*, Burkhard Wörtler, Kiki M.M. De Jonge

University of Groningen, The Netherlands

## ARTICLE INFO

## Article history:

Received 3 July 2015

Received in revised form

15 February 2016

Accepted 16 February 2016

Available online 27 February 2016

## Keywords:

ICT

Flexible work arrangements

Job control

Workstress

Job resources

Person-environment fit

## ABSTRACT

Work overload or work pressure may undermine workers' intrinsic motivation. In the present research, we tested the conditions under which this may (not) occur, including the perceived opportunity to blend on-site and off-site working through the effective use of computers and modern information and communication technology. Our sample consisted of 657 workers (51% female) representing a variety of industries. As hypothesized, it is not high job demands per se, but high demands in combination with a high need for autonomy and a lack of perceived opportunities for blended working that undermines intrinsic work motivation. When workers high in need for autonomy perceived opportunities for blended working, their intrinsic work motivation was not negatively affected by increasing job demands. This main finding suggests that, particularly for workers high in need for autonomy, the perceived opportunity for blended working is an effective, contemporary resource to cope with the increasing job demands typically observed in today's workplace. Theoretically, these findings contribute to the refinement and extension of influential demands-resource models and Person-Job Fit theory. Practically, our findings may show managers how to effectively keep workers intrinsically motivated and productive in their jobs when job demands are high.

© 2016 Elsevier Ltd. All rights reserved.

## 1. Introduction

An important trend in today's fast-moving societies is the increasing reliance on new information and communication technologies (ICTs). The rapid advance of ever-improving computers and ICTs in modern societies enables blended working, that is, smooth and seamless time-independent working (flexibility in when and how long workers engage in work-related tasks) and location-independent working (flexibility in where work gets done; Van Yperen, Rietzschel, & De Jonge, 2014). Blended working combines on-site and off-site working, and, accordingly, increases workers' job autonomy. High levels of job autonomy may be an effective resource for workers to cope with the increasing quantitative job demands typically observed in today's workplace. Quantitative job demands refer to work overload or work pressure or having too much work to do in too little time (e.g., Peeters, Montgomery, Bakker, & Schaufeli, 2005); it has been identified as a major cause of work-related stress. For example, in a recent

survey among 16,622 workers representing 31 European countries, 66% identified "hours worked or workload" as a common, contemporary cause of work-related stress (European Agency for Safety and Health at Work, 2013). In line with the central tenets of the Job Demand-Control (JD-C) model (Karasek, 1979) and the Job Demands-Resources (JD-R) model (Bakker & Demerouti, 2007), in the present research, we tested the assumption that the link between perceived job demands and intrinsic work motivation is moderated by the perceived opportunity for blended working.

According to the basic tenets of the JD-C model (Karasek, 1979) and the JD-R model (Bakker & Demerouti, 2007), it is not high demands per se, but high demands in combination with a lack of job resources (e.g., job autonomy) that undermine desirable work outcomes such as intrinsic work motivation. Based on these models, we examined whether the new concept of perceived opportunity for blended working, as a contemporary form of perceived job autonomy, operates as an antagonist or buffer to high quantitative job demands (cf., Wall, Jackson, Mullarkey, & Parker, 1996). The opportunity for blended working, enabled through modern information and communication technologies (Van Yperen et al., 2014), enables workers to determine both their working hours (e.g., traditional office hours, in the evening, on weekends)

\* Corresponding author. University of Groningen, Department of Psychology, Grote Kruisstraat 2/1, 9712 TS Groningen, The Netherlands.

E-mail address: [N.van.Yperen@rug.nl](mailto:N.van.Yperen@rug.nl) (N.W. Van Yperen).

and their work locations (e.g., at the office, at home, in the train, or at 'neutral' workplaces that are shared, swapped, reserved, rented, or simply claimed for a time).

Because the opportunity for blended working enhances workers' freedom to decide when and where to work, this contemporary form of job autonomy can be expected to be positively related to intrinsic work motivation (Fagerlind, Gustavsson, Johansson, & Ekberg, 2013; Hackman & Oldham, 1980; Van Yperen & Hagedoorn, 2003). Intrinsic motivation is the motivation to perform an activity for itself, in order to experience the pleasure and satisfaction inherent in the activity (Deci, Connell, & Ryan, 1989; Vallerand, 1997). Both the JD-C model (Karasek, 1979) and the JD-R model (Bakker & Demerouti, 2007) predict that the arousal produced by high job demands will not undermine workers' intrinsic motivation when they perceive opportunities to manage and effectively cope with the high demands. In contrast, when such opportunities are absent (i.e., job autonomy is low), the arousal associated with high job demands cannot be transformed into action and, consequently, will be directed internally and undermine intrinsic motivation (Van Yperen & Hagedoorn, 2003). Thus, the perceived opportunity for blended working may be particularly important for workers' intrinsic motivation when they find themselves in highly demanding jobs, but this may apply only for workers high in need for autonomy, as will be discussed next.

Person-Job Fit theory (Kristof-Brown, Zimmerman, & Johnson, 2005) suggests that an optimal fit between workers and their jobs creates synergy, and, accordingly, better outcomes such as intrinsic work motivation and job performance. Integrating the person-job fit principle into the JD-C model (Karasek, 1979) and the JD-R model (Bakker & Demerouti, 2007), person-job fit would predict that the perceived opportunity for blended working does not necessarily mitigate the negative effect of high job demands on intrinsic work motivation for all workers. Because blended working provides workers with discretion as to where and when to work (Van Yperen et al., 2014), only workers who have a strong need for autonomy may feel that blended working works for them. In line with typical use in organizational theories (e.g., Gagné & Deci, 2005), need for autonomy refers to individual differences in the desire to experience a sense of choice and psychological freedom, and to experience oneself as the initiator and regulator of one's actions (cf., Deci & Ryan, 2000; Van den Broeck, Vansteenkiste, De Witte, Soenens, & Lens, 2010; Van Yperen et al., 2014). Hence, we hypothesized that a negative link exists between perceived job demands and intrinsic work motivation when perceived opportunities for blended working are low, but only when workers' need for autonomy is high. When workers' need for autonomy is low, the perceived opportunity for blended working may not affect the link between job demands and intrinsic work motivation.

In sum, the present study specifies the JD-C model (Karasek, 1979) and the JD-R model (Bakker & Demerouti, 2007) by testing the proposal that it is not high demands per se, but high demands in combination with a lack of perceived opportunities for blended working that undermine intrinsic work motivation. Additionally, the current research integrates Person-Job Fit theory (Kristof-Brown et al., 2005) by proposing that the strength of workers' need for autonomy moderates this relationship such that the predicted pattern will be observed exclusively among workers high in need for autonomy.

## 2. Method

### 2.1. Participants and procedure

The participants were recruited through Amazon's Mechanical

Turk (MTurk) (Buhrmester, Kwang, & Gosling, 2011; Mason & Suri, 2012) to complete an online questionnaire on well-being at work in exchange for monetary compensation. We used system qualifications such that eligible individuals were English native speakers between 18 and 65 years of age who were gainfully employed for at least 8 h per week. To ensure high-quality data, we followed guidelines for detecting careless responses (e.g., Mason & Suri, 2012; Meade & Craig, 2012; Stanton & Rogelberg, 2001). Participants were eliminated from the sample when they (1) responded incorrectly to two bogus items that had verifiable answers (i.e., I am currently using a computer; I have been to every country in the world); (2) self-identified themselves as careless respondents by indicating at the end of the questionnaire that we should not use their data or that they did not answer all questions truthfully; (3) responded unexpectedly and illogically with a single response option across 30 consecutive items; (4) had extreme item values falling outside the range of three standard deviations above and below the mean (e.g., Cohen, Cohen, West, & Aiken, 2003); (5) did not entirely complete the questionnaire.

The final sample consisted of 657 workers (51% female) representing a variety of industries (e.g., retail trade and catering, healthcare and social assistance, information technology, education, research and science, and financial and business consultancy). This sample size provides a power of .80 for detecting medium-sized effects of the hypothesized three-way interaction at the  $p < .05$  level at the minimum (Cohen, 1992). Ages ranged from 18 to 65 years ( $M = 31.35$ ,  $SD = 11.22$ ), and 16.4% held a management position. Educational level varied from high school degree (50.5%), and bachelor's degree (38.2%), to MSc or PhD degree (11.3%); and the number of work hours from 8 to 50 h per week ( $M = 33.73$ ,  $SD = 10.38$ ).

We obtained informed consent from each participant by asking their agreement with statements that explained the purpose of the study, the (lack of) risks and benefits of the research, and the confidential and voluntary nature of the study, and that provided a means by which the subjects could contact us about problems they may have experienced in the course of participating in the study. The research was explicitly approved by the Institutional Review Board (IRB) of the Department of Psychology, University of Groningen.

### 2.2. Measures

#### 2.2.1. Job demands

Job demands were assessed using a validated 11-item measure of quantitative job demands (Van Veldhoven & Meijman, 1994); for all items, see Van Yperen and Hagedoorn (2003). The items refer to the degree to which a worker is required to work fast and hard, has a great amount of work to do, and has too little time. Participants were posed questions such as, "Do you have to work extra hard to finish a task?" and "Do you have to deal with a backlog at work?" They responded on a scale ranging from 1 = *never*, to 4 = *always*. A scale score was computed by averaging the scores on the individual items. Higher values on this scale indicate higher perceived job demands. The internal consistency of the job demands scale was high, Cronbach's  $\alpha = .84$ .

#### 2.2.2. Perceived opportunity for blended working

Perceived opportunity for blended working was assessed using a six-item measure that was developed for the current study. Participants responded on a seven-point scale, ranging from 1 = *strongly disagree*, to 7 = *strongly agree*, to the following six statements: (1) The nature of my job is well-suited to location-independent working; (2) My private situation allows me to work at home; (3) The nature of my job is well-suited to time-independent working; (4) My private situation allows for time-

independent working; (5) The nature of my job is well-suited to e-working; and (6) Our organization ensures the availability of high-tech ICTs. The scores on each item were averaged into a scale score; a higher score represents more perceived opportunity for blended working. The internal consistency of this new scale was high, Cronbach's  $\alpha = .85$ .

2.2.3. Need for autonomy at work

Need for autonomy at work was assessed using a four-item need-strength measure developed by Van Yperen et al. (2014). Employing a seven-point response scale ranging from 1 = *not at all*, to 7 = *to an extremely large extent*, participants indicated the degree to which statements such as, "At work I have the need to decide on my own how to go about getting my job done" were applicable to them. A scale score was computed by averaging the scores on the four items into a single score for each participant. A higher score indicates a stronger need for autonomy at work. The internal consistency of the need for autonomy scale was very high, Cronbach's  $\alpha = .90$ .

2.2.4. Intrinsic motivation at work

Intrinsic motivation at work was assessed using the adjusted version (that is, adapted to the context of the focal job here) of the Intrinsic Motivation Scale developed and validated by Vallerand and his associates (for a review, see Vallerand, 1997). This 12-item scale represents three types of intrinsic motivation: intrinsic motivation to know (e.g., "For the pleasure of doing new things in my job"), to accomplish things (e.g., "For the satisfaction I feel while overcoming certain difficulties in my job"), and to experience stimulation (e.g., "Because I like the feeling of being totally immersed in my job.") For all items, see Van Yperen and Hagedoorn (2003). Items were followed by a seven-point response scale, ranging from 1 = *strongly disagree*, to 7 = *strongly agree*. The three highly correlated subscales were combined into one single intrinsic motivation score (cf., Van Yperen & Hagedoorn, 2003). The internal consistency was very high, Cronbach's  $\alpha = .96$ .

3. Results

3.1. Descriptive data

Table 1 presents the means, standard deviations, and correlations between all variables. As expected, the perceived opportunity for blended working is positively valenced; the link with intrinsic work motivation is positive ( $r = .33$ ), and the link with perceived job demands is negative ( $r = -.15$ ). Additional t-tests revealed that relative to workers who did not occupy a management position, managers were older ( $M_{\text{nonMan}} = 30.41, SD = 11.06$  versus  $M_{\text{Man}} = 36.12, SD = 10.84, t(655) = 4.92, p < .001$ ), were higher educated ( $M_{\text{nonMan}} = 1.56, SD = 0.66$  versus  $M_{\text{Man}} = 1.83, SD = 0.73, t(655) = 3.81, p < .001$ ), worked more hours per week ( $M_{\text{nonMan}} = 32.73, SD = 10.58$  versus  $M_{\text{Man}} = 38.78, SD = 7.52, t(200.646) = 7.09, p < .001$ ), perceived more opportunities for blended working ( $M_{\text{nonMan}} = 4.22, SD = 1.60$  versus  $M_{\text{Man}} = 4.58,$

$SD = 1.59, t(655) = 2.15, p = .03$ ), reported a higher need for autonomy ( $M_{\text{nonMan}} = 4.85, SD = 1.18$  versus  $M_{\text{Man}} = 5.54, SD = 0.99, t(655) = 5.69, p < .001$ ), and were higher in intrinsic motivation ( $M_{\text{nonMan}} = 4.63, SD = 1.35$  versus  $M_{\text{Man}} = 5.11, SD = 1.35, t(655) = 3.37, p = .001$ ). Management position and sex were not related,  $\chi^2(1) = .73, p = .39$ ). The only sex difference obtained was that women were older than men ( $M_{\text{women}} = 32.82, SD = 11.86$  versus  $M_{\text{men}} = 29.82, SD = 10.31, t(648.524) = 3.46, p < .001$ ).

3.2. Test of the hypothesis

Our hypothesis was that a negative link exists between perceived job demands and intrinsic work motivation when perceived opportunities for blended working are low, but only when workers' need for autonomy is high. To test this hypothesis, we conducted a hierarchical regression analysis with intrinsic motivation regressed on job demands, perceived opportunities for blended working, need for autonomy, and their interactions. The predictor variables were centered in order to reduce multicollinearity, and then multiplied by each other to form the interaction terms (Aiken & West, 1991). To statistically control for their (weak) influence, age, educational level, work hours according to contract, and the dummy variables sex and management position were entered as covariates into the model. As shown in Table 2, we found some main effects and two-way interactions that were qualified by the anticipated three-way interaction.

The significant three-way interaction is plotted in Fig. 1. As expected, intrinsic motivation decreased as a function of perceived job demands when perceived opportunities for blended working were low and workers' need for autonomy was high. Increasing job demands did not undermine workers' intrinsic motivation when both perceived opportunities for blended working and need for autonomy were high. Among workers low in need for autonomy, there was no link between job demands and intrinsic motivation. Thus, as hypothesized, perceived opportunities for blended working can buffer the potential negative effects of high job demands on intrinsic motivation, but only for workers high in need for autonomy.

4. Discussion

Blended working refers to smooth and seamless time- and location-independent working, which increases workers' job autonomy and intrinsic work motivation (Van Yperen et al., 2014). Drawing on the JD-C model (Karasek, 1979) and the JD-R model (Bakker & Demerouti, 2007), our findings suggest that the perceived opportunity for blended working is an effective, contemporary resource for workers to cope with the increasing job demands typically observed in today's workplace. By integrating the Person-job Fit theory (Kristof-Brown et al., 2005), we additionally demonstrated that the predicted pattern applied only for workers high in need for autonomy. Specifically, workers high in need for autonomy who perceived opportunities for blended

Table 1  
Means, standard deviations, and correlations (n = 657).

Variable	M	SD	2	3	4	5	6	7
1. Age	31.35	11.22	.20	.16	-.09	.17	.13	.08
2. Educational level	1.61	0.68	-	.19	-.004	.10	.12	.16
3. Number of working hours	33.73	10.38	-	-	.11	.08	.18	.12
4. Job Demands	2.33	0.49	-	-	-	-.15	.10	-.08
5. Perceived Opp. for BW	4.28	1.61	-	-	-	-	.24	.33
6. Need for Autonomy	4.96	1.18	-	-	-	-	-	.26
7. Intrinsic Motivation	4.71	1.36	-	-	-	-	-	-

Note. Correlations higher than .08 and .11 are significant at the  $p = .05$  and  $p = .01$  level, respectively.

**Table 2**  
Results of the hierarchical regression analysis (n = 657).

		Intrinsic Motivation <sup>a</sup>			
Step	Predictors	1	2	3	4
1	Sex	.01	.01	.02	.02
	Age	.003	-.004	-.004	-.003
	Education Level	.25**	.19*	.18*	.17*
	Manager Position	.17*	.10	.11	.11
	Work Hours	.01	.01	.01	.01
2	Job Demands (JD)		-.19	-.12	-.16
	Opp. for blended working (BW)		.23***	.22***	.21***
	Need for Autonomy (Naut)		.20***	.21***	.21***
3	JD × BW			.28***	.26***
	JD × Naut			-.22*	-.17
	BW × Naut			-.01	.004
4	JD × BW × Naut				.14*
<i>F</i> <sub>change</sub>		5.70***	30.49***	5.49***	5.47*
<i>df F</i> <sub>change</sub>		5,651	3,648	3,645	1,644
<i>R</i> <sup>2</sup>		.04***	.16***	.18***	.19*
$\Delta R^2$		.04***	.12***	.02***	.01*

Note. \*p < .05, \*\*p < .01, \*\*\*p < .001.

<sup>a</sup> Unstandardized regression coefficients are shown.

working reported the highest levels of intrinsic work motivation as job demands increased. In contrast, workers high in need for autonomy who perceived little opportunity for blended working reported lower levels of intrinsic motivation under conditions of high job demands. For workers low in need for autonomy, we observed no link between job demands and intrinsic work motivation. Their level of intrinsic motivation was relatively low, which is also indicated by the positive link between need for autonomy and intrinsic motivation (see Tables 1 and 2).

In this study, we extended the scope of previous work by emphasizing the importance of fit between work context and workers' psychological needs. Specifically, Van Yperen et al. (2014) demonstrated that workers' perceived personal effectiveness of blended working was higher when workers' need for autonomy was high and their need for relatedness and need for structure were low. The added value of the present research is that particularly for workers high in need for autonomy, the perceived opportunity for blended working moderates the link between perceived quantitative job demands and intrinsic work motivation. This finding adds to the literature on the JD-C model (Karasek, 1979) because it suggests that previous findings on this model may particularly

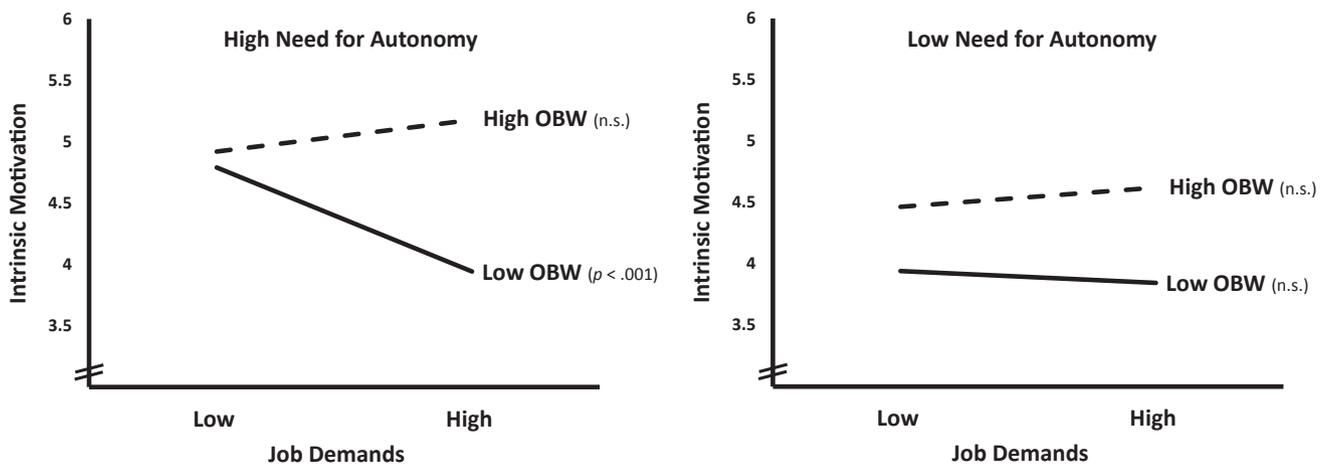
apply for workers high in need for autonomy. Similarly, future studies may test the prediction that a job resource such as social support may be particularly effective for workers high in need to belong (or need for relatedness), that is, individuals' desire to feel connected to others and to be a member of a group (Baumeister & Leary, 1995).

In addition, we provide initial evidence that the perceived opportunity for blended working is an effective contemporary form of job autonomy, which can maintain workers' intrinsic work motivation in case of high perceived job demands. Indeed, through the effective use of computers and modern information and communication technology, blending on-site and off-site working may have substantial positive consequences for workers' effectiveness and quality of work and life (Van Yperen et al., 2014). For example, in their meta-analysis, Gajendran and Harrison (2007) showed that work arrangements allowing workers to perform their tasks while being remote from their office had mainly beneficial effects on work-home balance, job satisfaction, and job performance.

However, as emphasized by Van Yperen et al. (2014), blended working may have downsides as well, including relational and information impoverishment at work, ambiguity about tasks and roles, career stagnation ("out of sight, out of mind"), increased work-home interference, distraction and interruption by family members (particularly when there is no detached home office space), and the pressure to be available anywhere, at any time. Hence, it is important to know for whom blended working may (not) work. In their paper, Van Yperen et al. (2014) provided preliminary evidence that blended working works particularly well for workers high in need for autonomy at work, which is in line with the present findings, as well as for workers low in need for relatedness and low in need for structure at work. Because older workers tend to be higher in need for autonomy (see Table 1) and lower in need for relatedness and need for structure (Van Yperen et al., 2014), the opportunity for blended working may fulfill particularly older workers' psychological needs. In order to retain older workers and to keep them satisfied, motivated, and productive in their jobs, organizations may rely more on blended working practices (De Jonge, Van Yperen, & Rietzschel, 2015).

4.1. Strengths and limitations

Some strengths of the present findings are the strong theoretical basis and the observed main effects and two-way interactions,



**Fig. 1.** Interactive effect of job demands, perceived opportunity for blended working (OBW), and need for autonomy on intrinsic work motivation. 'Low' and 'high' reflect a value of 1 SD below and above the mean, respectively.

which are consistent with previous findings. A limitation may be the cross-sectional design, which does not allow valid conclusions to be drawn about causal relationships between variables. A second limitation may be our MTurk sample, which may represent a specific population of Internet users (Crowston, 2012; Ipeirotis, 2010). However, the statistical power is high due to the sample size, the internal consistency of the measures used, and the variety of background variables controlled for in the main analysis (Maxwell & Delaney, 2004). Furthermore, we carefully followed guidelines for detecting careless responses (e.g., Mason & Suri, 2012; Meade & Craig, 2012; Stanton & Rogelberg, 2001). Third, our sample represents a variety of businesses (18 types; frequencies ranged from .2 to 14.8) so that we could not reliably test for differences between businesses. It is not unlikely that blended working may work better in some businesses and some jobs than in other, which may be put to empirical test in follow-up studies. Fourth, our study is based on self-reports, but as pointed out by Siemsen, Roth, and Oliveira (2010), common-method variance is less of a problem in regression models with many independent variables, especially if these variables are not highly (<.30) correlated. In addition, significant interaction effects are typically attenuated rather than strengthened by common-method variance. A fifth issue that should be noted is that the perceived opportunity for blended working reflects a sense of choice and psychological freedom, and the feeling that one is the initiator and regulator of one's actions (Deci & Ryan, 2000; Van den Broeck, Vansteenkiste, Witte, Lens, & Soenens, 2010). Such perceptions of job autonomy are associated with experienced responsibility for one's own work outcomes (Kiggundu, 1983). However, experienced responsibility at work is also a function of initiated task interdependence, which leads to experienced responsibility for the work outcomes of others for whom one initiates work, and, consequently, to higher work motivation. In contrast, received task interdependence, that is, the extent to which a person in a particular job is affected by the workflow from one or more other jobs, tends to reduce job autonomy by leaving workers' schedules and responsibilities reliant on the actions of others. Particularly for workers high in need for autonomy, this will lead to a decrease in intrinsic work motivation (Kiggundu, 1983). Acknowledging that jobs exist as a network of interconnected positions, job designers and job crafters should take these additional job features into account when designing and creating jobs with high motivating potential. A sixth possible limitation of the present research is its focus on perceived opportunity for blended working rather than actual blended working. However, Glass and Singer (1972) demonstrated that perceived autonomy (without using it) actually leads to better performance. They placed people in a noisy environment and either told them that they could control the noise (with a switch) or that they had no control over the noise. The group who had control did not often use it, but performed better on a subsequent task. Hence, one may hypothesize that workers feel and perform better when they perceive the opportunity for blended working, even if they do not actually use the opportunity; this may be particularly true for workers high in need for autonomy under conditions of high job demands.

#### 4.2. Conclusion

Our findings suggest that it is not high job demands per se, but high demands in combination with a high need for autonomy and a lack of perceived opportunities for blended working that undermines intrinsic work motivation. When workers high in need for autonomy perceived opportunities for blended working, high job demands did not negatively affect their intrinsic work motivation. Hence, organizations and managers should create conditions at work that are conducive to their workers' psychological

needs (Williams et al., 2014). Although it has been argued that the need for autonomy is intrinsically human (Ryan & Deci, 2000), our findings suggest that workers who are relatively low in need for autonomy tend to profit less from the opportunity for blended working. Workplace interventions that provide structure and routine rather than job autonomy may work better for them, particularly when they are high in need for structure as well (Leone, Wallace, & Modglin, 1999; Van Yperen et al., 2014). Research has shown that managerial support for psychological needs is positively related to workers' psychological health, social wellness, and work-related functioning (e.g., Gagne & Deci, 2005; Van den Broeck et al., 2010). Our findings indicate that for workers high in need for autonomy, managers should provide opportunities for time- and location-independent working; this may be particularly effective when job demands are high.

#### References

- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Thousand Oaks, CA: US: Sage Publications, Inc.
- Bakker, A. B., & Demerouti, E. (2007). The job demands-resources model: state of the art. *Journal of Managerial Psychology*, 22, 309–328. <http://dx.doi.org/10.1108/02683940710733115>.
- Baumeister, R. F., & Leary, M. R. (1995). The need to belong: desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, 117, 497–529.
- Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk: a new source of inexpensive, yet high-quality, data? *Perspectives on Psychological Science*, 6, 3–5. <http://dx.doi.org/10.1177/1745691610393980>.
- Cohen, J. (1992). A power primer. *Psychological Bulletin*, 112, 155–159. <http://dx.doi.org/10.1037/0033-2909.112.1.155>.
- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). Mahwah, NJ: Lawrence Erlbaum Associates Publishers.
- Crowston, K. (2012). Amazon Mechanical Turk: a research tool for organizations and information systems scholars. In A. Bhattacharjee, & B. Fitzgerald (Eds.), *Shaping the future of ICT research: Methods and approaches* (pp. 210–221). Heidelberg: Springer. <http://dx.doi.org/10.1007/978-3-642-35142-6-14>.
- De Jonge, K. M. M., Van Yperen, N. W., & Rietzschel, E. F. (2015). Age and blended working. In N. A. Pachana, & N. Thapa (Eds.), *Encyclopedia of geropsychology*. New York: Springer.
- Deci, E. L., Connell, J. P., & Ryan, R. M. (1989). Self-determination in a work organization. *Journal of Applied Psychology*, 74, 580–590.
- Deci, E. L., & Ryan, R. M. (2000). The 'What' and 'Why' of goal pursuits: human needs and the self-determination of behavior. *Psychological Inquiry*, 11, 227–268.
- European Agency for Safety and Health at Work. (2013). *European opinion poll on occupational safety and health*. Luxembourg: Publications Office of the European Union. <http://dx.doi.org/10.2802/55505>. <https://osha.europa.eu/en/safety-health-in-figures/eu-poll-press-kit-2013.pdf>.
- Fagerlin, A., Gustavsson, M., Johansson, G., & Ekberg, K. (2013). Experience of work-related flow: does high decision latitude enhance benefits gained from job resources? *Journal of Vocational Behavior*, 83, 161–170. <http://dx.doi.org/10.1016/j.jvb.2013.03.010>.
- Gagné, M., & Deci, E. L. (2005). Self-determination theory and work motivation. *Journal of Organizational Behavior*, 26, 331–362. <http://dx.doi.org/10.1002/job.322>.
- Gajendran, R. S., & Harrison, D. A. (2007). The good, the bad, and the unknown about telecommuting: meta-analysis of psychological mediators and individual consequences. *Journal of Applied Psychology*, 92, 1524–1541. <http://dx.doi.org/10.1037/0021-9010.92.6.1524>.
- Glass, D. C., & Singer, J. (1972). *Urban stressors: Experiments on noise and social stressors*. New York: Academic Press.
- Hackman, J. R., & Oldham, G. R. (1980). *Work redesign*. Reading, MA: Addison-Wesley.
- Ipeirotis, P. (2010). *Demographics of mechanical turk. CeDER-10-01 working paper*. New York University.
- Karasek, R. A. (1979). Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly*, 24, 285–308.
- Kiggundu, M. N. (1983). Task interdependence and job design: test of a theory. *Organizational Behavior & Human Performance*, 31, 145–172.
- Kristof-Brown, A. L., Zimmerman, R. D., & Johnson, E. C. (2005). Consequences of individuals' fit at work: a meta-analysis of person-job, person-organization, person-group, and person-supervisor fit. *Personnel Psychology*, 58, 285–342.
- Leone, C., Wallace, H. M., & Modglin, K. (1999). The need for closure and the need for structure: interrelationships, correlates, and outcomes. *The Journal of Psychology: Interdisciplinary and Applied*, 133, 553–562. <http://dx.doi.org/10.1080/00223989909599762>.
- Mason, W., & Suri, S. (2012). Conducting behavioral research on Amazon's

- mechanical Turk. *Behavior Research Methods*, 44, 1–23. <http://dx.doi.org/10.3758/s13428-011-0124-6>.
- Maxwell, S. E., & Delaney, H. D. (2004). *Designing experiments and analyzing data: A model comparison perspective* (2nd ed.). Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers.
- Meade, A. W., & Craig, S. B. (2012). Identifying careless responses in survey data. *Psychological Methods*, 17, 437–455. <http://dx.doi.org/10.1037/a0028085>.
- Peeters, M. C. W., Montgomery, A. J., Bakker, A. B., & Schaufeli, W. B. (2005). Balancing work and home: how job and home demands are related to burnout. *International Journal of Stress Management*, 12, 43–61. <http://dx.doi.org/10.1037/1072-5245.12.1.43>.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55, 68–78. <http://dx.doi.org/10.1037/0003-066X.55.1.68>.
- Siemsen, E., Roth, A., & Oliveira, P. (2010). Common method bias in regression models with linear, quadratic, and interaction effects. *Organizational Research Methods*, 13, 456–476. <http://dx.doi.org/10.1177/1094428109351241>.
- Stanton, J. M., & Rogelberg, S. G. (2001). Using internet/intranet web pages to collect organizational research data. *Organizational Research Methods*, 4, 200–217.
- Vallerand, R. J. (1997). Toward a hierarchical model of intrinsic and extrinsic motivation. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (pp. 271–360). New York: Academic Press.
- Van Veldhoven, M., & Meijman, T. (1994). *Het meten van Psychosociale arbeidsbelasting. [The measurement of psychosocial job demands]*. Amsterdam: Nederlands Instituut voor Arbeidsomstandigheden.
- Van Yperen, N. W., & Hagedoorn, M. (2003). Do high job demands increase intrinsic motivation or fatigue or both? The role of job control and job social support. *Academy of Management Journal*, 46, 339–348. <http://dx.doi.org/10.2307/30040627>.
- Van Yperen, N. W., Rietzschel, E. F., & De Jonge, K. M. M. (2014). Blended working: for whom it may (not) work. *PLoS One*, 9, 1–8. <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0102921>.
- Van den Broeck, A., Vansteenkiste, M., Witte, H., Lens, W., & Soenens, B. (2010). Capturing autonomy, relatedness and competence at work: construction and validation of a work-related basic need satisfaction scale. *Journal of Occupational and Organizational Psychology*, 83, 981–1002. <http://dx.doi.org/10.1348/096317909X481382>.
- Wall, T. D., Jackson, P. R., Mullarkey, S., & Parker, S. K. (1996). The demands-control model of job strain: a more specific test. *Journal of Occupational & Organizational Psychology*, 69, 153–166.
- Williams, G. C., Halvari, H., Niemiec, C. P., Sørøbø, Ø., et al. (2014). Managerial support for basic psychological needs, somatic symptom burden and work-related correlates: a self-determination theory perspective. *Work & Stress*, 28, 404–419. <http://dx.doi.org/10.1080/02678373.2014.971920>.