



Short research note

Daily associations between basic psychological need satisfaction and well-being at work: The moderating role of need strength

Madelon L. M. van Hooff^{1*}  and Irene E. De Pater²

¹Behavioural Science Institute, Radboud University, The Netherlands

²National University of Singapore, Singapore

With this paper, we aim to enhance insight in the daily relationships between the satisfaction of basic psychological needs (i.e., the needs for autonomy, competence, and relatedness) at work and employee well-being (as indicated by positive energy), by examining the moderating role of the strengths of these needs. We collected data by means of a 2-week diary study with two daily measurements (in the morning before work and at the end of the workday) among 109 fulltime working interns. Multi-level analyses showed that the positive relationship between daily satisfaction of the need for relatedness at work and employee well-being at the end of the workday was stronger for participants who expressed a high strength of this need. Furthermore, on workdays when participants experienced higher satisfaction of the needs for competence and autonomy, they experienced higher well-being. Although we did not find moderating effects of need strength for these two needs, results did indicate between-individual variance in the strength of the associations between satisfaction of these needs and employee well-being.

Practitioner points

- Daily satisfaction of the basic psychological needs of autonomy, competence, and relatedness at work should be supported, because this relates positively to employee well-being.
- Enabling work-related satisfaction of the need for relatedness is especially important for employees who exhibit a strong strength of this need.

A basic tenet of the Self-Determination Theory (SDT; Deci & Ryan, 2000) is that the satisfaction of three basic innate psychological needs fosters individual growth and well-being. The *need for autonomy* entails the need to experience self-endorsement or volition in one's actions (Ryan, Bernstein, & Brown, 2010) and to act as the originator of one's own behaviour (Patrick, Knee, Canevello, & Lonsbary, 2007). The *need for competence* comprises the feeling of being effective in one's actions as well as having opportunities to use one's capacities (Deci, 1975), whereas the *need for relatedness* refers to the need to feel close and connected to others (Baumeister & Leary, 1995). A large

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited and is not used for commercial purposes.

*Correspondence should be addressed to Madelon L. M. van Hooff, Behavioural Science Institute, Radboud University, PO Box 9104, 6500 HE Nijmegen, The Netherlands (email: M.vanHooff@psych.ru.nl).

body of empirical research supports this proposition of SDT in various life domains. For example, with respect to the work context, a recent meta-analysis has shown positive associations between work-related need satisfaction and various indicators of employee well-being (Van den Broeck, Ferris, Chang, & Rosen, 2016).

Another theory that focuses on human needs is McClelland's (1985) Motivation Disposition Theory (MDT). This theory distinguishes three motives that guide human behaviour: the needs for achievement, affiliation, and power. MDT differs from SDT in a number of ways. First, whereas SDT focuses on *need satisfaction*, MDT emphasizes *need strength*. Second, whereas SDT posits that needs are innate, MDT poses that needs are developed in childhood. Third, the needs that are central to MDT do not fully correspond with the basic needs as defined in SDT (Chen *et al.*, 2015). Similar to SDT's need for competence, the *need for achievement* (i.e., the desire to meet and exceed high standards of excellence on one's actions; McClelland, Atkinson, Clark, & Lowel, 1953) focuses on people's experience of competence when interacting with the environment. MDT's *need for affiliation* resembles SDT's *need for relatedness* in that both focus on close interpersonal relationships (Schüler, Brandstätter, & Sheldon, 2013). However, the *need for power* only partially resembles the need for autonomy as defined in SDT, in that it not only entails the need to liberate oneself from the impact of others (Schüler *et al.*, 2013; Winter, 1973), but also the desire to influence other people (Schüler *et al.*, 2013; Winter, 1973). This latter aspect does not resemble any of the needs that SDT distinguishes.

Finally, although SDT does not *a priori* preclude the existence of interindividual differences in need strength (Deci & Ryan, 2000), it assumes that need strength will have no or only a minimal effect on the need satisfaction – well-being relationship (Chen *et al.*, 2015). In contrast, MDT posits that although need satisfaction will have positive effects for everyone, it will be more beneficial for individuals with a strong need strength (i.e., preferences for incentives; Schultheiss & Hale, 2007) corresponding to the need that is satisfied. The notion that need satisfaction equally benefits everyone has been coined the 'universal hypothesis', whereas the notion that the effects of need satisfaction depend on need strength has been labelled the 'matching hypothesis' (Schüler *et al.*, 2013).

Schüler *et al.* (2013) proposed that the universal hypothesis applies to the association between need satisfaction and *general* well-being, whereas the matching hypothesis would apply to relationships between need satisfaction and *domain-specific* forms of well-being. Based on MDT, these authors argue that the strength of a need determines individuals' capacity to derive satisfaction from a situation corresponding to that need. For example, the well-being of individuals with a high strength of the need for competence would benefit more from a challenging work context that offers opportunities to satisfy this need than the well-being of individuals with a lower strength of this need. Because general well-being is supposed to be determined by the sum of experiences in various contexts of life rather than by one specific context, need strength would not affect the association between satisfaction of a need in a context that supports its satisfaction and general well-being.

The relatively limited number of empirical studies that have so far examined the moderating role of need strength in the relationship between need satisfaction and well-being seem to support the assumption that the universal hypothesis applies to general well-being outcomes and the matching hypothesis applies to domain-specific outcomes. For example, Chen *et al.* (2015) found that explicit (i.e., self-report) measures of the strength of the needs for autonomy, relatedness, and competence did not moderate the association between need satisfaction and general well-being outcomes. Flunger, Pretsch, Schmitt, and Ludwig (2013) found that – in a school context – domain-specific, explicit measures of autonomy, and

competence need strength moderated the association between the (dis)satisfaction of these needs and domain-specific well-being outcomes. Furthermore, in a work context, studies focusing on general (rather than work-related) need strength and need satisfaction have shown that implicit measures of the strength of the need for achievement moderated the associations between competence satisfaction and work domain-related well-being outcomes (Hofer & Busch, 2011; Schüler *et al.*, 2013).

In the present study, we extend research that examined the moderating role of need strength in the association between basic psychological need satisfaction and well-being outcomes in a work context in two ways. First, previous studies examining the moderating role of need strength in a work context focused exclusively on competence satisfaction. Yet, given the importance of the work-related satisfaction of all three basic psychological needs for employee well-being (Van den Broeck *et al.*, 2016), it is important to learn whether need strength also moderates the association between satisfaction of the work-related needs for autonomy and relatedness and well-being outcomes. Therefore, we incorporate all three basic psychological needs that have been defined in SDT. Secondly, so far, studies examining the moderating role of need strength in the work domain have incorporated general, context-free, indicators of need strength. In the current study, we focus on relationships between domain-specific need strength and satisfaction as well as on domain-specific outcomes. We believe this is important because people may differ with respect to the importance they place on having their basic psychological needs satisfied in different domains of their life, depending on, for example, the centrality of work in their lives.

Contrary to need strength, which is (relatively) stable over time (McClelland, 1985), need satisfaction and well-being fluctuate from day to day (e.g., Ilies & Judge, 2005; Van Hooff & Van Hooff, 2017). Hence, we employed daily measures of these latter constructs in our study (i.e., 'daily diary study') in order to minimize the bias and error that occur when participants provide global and retrospective reports about transient experiences (Fisher & To, 2012). Given the importance of energy and vitality in SDT (Deci & Ryan, 2008), we use positive energy experienced at the end of the workday as indicator of well-being. Based on the proposition underlying the matching hypothesis that need strength determines individuals' capacity to derive satisfaction from a situation corresponding to that need (Schüler *et al.*, 2013) we hypothesize:

Hypothesis 1: The associations between daily work-related satisfaction of the needs for autonomy, competence, and relatedness and positive energy at the end of the workday will be moderated by the strength of the corresponding need, such that these associations are stronger in case of higher need strength.

Method

Participants and procedure

The data used in the present study were part of a bigger project on the work experiences of students of a large business school in Asia who were employed as full-time paid interns. Participants first completed a general questionnaire measuring their demographic information and work-related need strength. Thereafter, they were asked to fill out three questionnaires daily for ten of the next thirteen workdays. Each day, we sent participants a link to the morning questionnaire at 7 AM (t1; to be completed before 9 AM), a link to the end of the workday questionnaire at 5 PM (t2; to be completed before 7 PM), and a link to the evening questionnaire at 9 PM (t3; to be completed before midnight). Data of this last

questionnaire were not included in the present study. Because questionnaires that were completed outside the requested periods may lack validity, we excluded t1 questionnaires that were completed after 10 AM (37 out of 1,106 responses), and t2 questionnaires that were completed after 8 PM (24 out of 1,089 responses).

A total of 109 full-time working interns (40.4% male) participated in our study. Their mean age was 22.12 years ($SD = 1.34$). They were on average in the fourth year of their studies ($M = 3.63$, $SD = 0.95$) and in week 9 of their internship ($M = 8.7$, $SD = 4.99$) at the start of the study. They worked in a wide variety of roles (e.g., sales executive, events manager, HR assistant) in industries such as banking, consulting, and oil and gas.

Measures

Psychological need strength

We measured the strengths of the work-related needs for autonomy, competence, and relatedness with four items each (Van Yperen, Rietzschel, & De Jonge, 2014) in the general questionnaire. Participants rated the extent to which they had these needs in their internship on a scale ranging from 1 (not at all) to 7 (to an extremely large extent). Item examples are 'the need to have a say in determining my activities and tasks' (need for autonomy; $\alpha = .86$), 'the need to feel like I am part of a team or a group' (need for relatedness; $\alpha = .84$), and 'the need to be good at my work' (need for competence; $\alpha = .84$).

Work-related need satisfaction

We daily assessed work-related need satisfaction at t2 with eight items adapted from the Work-related Basic Need Satisfaction Scale (Van den Broeck, Vansteenkiste, Witte, Soenens, & Lens, 2010) that were rated on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). We adapted the wording of items to make them suitable for day-to-day measurement. Sample items are 'Today at work, I felt competent' (competence satisfaction; three items, mean $\alpha = .85$), 'Today at work, I felt part of a group' (relatedness satisfaction; three items, mean $\alpha = .63$), and 'Today at work, my tasks were in line with what I really wanted to do' (autonomy satisfaction; two items¹ mean $\alpha = .61$).

Positive energy

We daily measured positive energy at t1 (control variable) and t2 with three items of the 4 Dimension Mood Scale (Gregg & Shepherd, 2009). Participants rated the items (e.g., 'At the moment, I feel energetic') on a 5-point Likert scale (1 = not at all, 5 = extremely). Mean α 's were .90 for the both t1 and t2 measures.

Results

Table 1 presents means, standard deviations, and correlations among the study variables. To test our hypothesis, we used multi-level analysis (ML estimation) in SPSS 23 (IBM Corp, Armonk, NY, USA). We conducted separate analyses for each combination of satisfaction of a certain need and its equivalent need strength. Positive energy t2 was entered as the

¹ We originally used three items to measure the satisfaction of this need, but removed one of them due to its negative effect on scale reliability.

Table 1. Means, standard deviations, and correlations of the study variables

	<i>M</i>	<i>SD</i>	1.	2.	3.	4.	5.	6.	7.	8.
1. Work-related autonomy satisfaction	3.50	0.70		.79**	.67**	.27**	.09	.06	.53**	.58**
2. Work-related competence satisfaction	3.50	0.69	.67**		.69**	.20*	-.00	-.02	.47**	.54**
3. Work-related relatedness satisfaction	3.67	0.65	.55**	.55**		.21*	.14	-.01	.30**	.37**
4. Need strength autonomy	4.99	0.94	.21**	.15**	.15**		.45**	.25*	.43**	.40**
5. Need strength competence	5.44	0.91	.07*	.00	.10**	.46**		.37**	.20*	.20*
6. Need strength relatedness	4.41	1.11	.04	-.01	-.01	.28**	.39**		.32**	.29**
7. Positive energy in the morning before work	2.27	1.03	.36**	.31**	.18**	.36**	.18**	.27**		.88**
8. Positive energy at the end of the workday	2.42	1.04	.44**	.42**	.29**	.32**	.17**	.25**	.65**	

Notes. Below diagonal: day-level correlations; above diagonal: person-level correlations.

* $p < .05$; ** $p < .01$.

dependent variable. Need strength and need satisfaction were centred around their grand means and were entered as independent variables in Model 1. This model also included positive energy t1 (grand-mean centered) as a control variable. We specified a random slope for the association between need satisfaction and positive energy t2 to account for between-person variance in this association. Model 2 was identical to Model 1, except for the additional inclusion of the cross-level interaction between need strength and need satisfaction. We tested the improvement in fit of Model 2 compared to Model 1 using a likelihood ratio statistic (following a chi-square distribution with the number of additional predictors as df). We used an alpha level of .05 and 2-sided tests for the fixed effects. As variances cannot be negative, we employed 1-sided tests for the random effects. Table 2 presents the results of the multi-level analyses.

For work-related autonomy satisfaction Model 1 shows that satisfaction of this need was positively related to positive energy t2. The significant slope variance of this variable indicates that there are interindividual differences in the strength of the association between autonomy satisfaction and positive energy t2. Adding the interaction between work-related autonomy satisfaction and work-related autonomy need strength to the analysis in Model 2 did not improve model fit. A similar pattern of results was obtained for work-related competence satisfaction. Hence, we found no support for our hypothesis for autonomy and competence satisfaction in the work domain.

A different pattern of results emerged for work-related relatedness satisfaction. In Model 1, satisfaction of the work-related need for relatedness was positively associated with positive energy t2, and the significant slope variance points to the existence of interindividual differences in the strength of this relationship. The inclusion of the

Table 2. Results of multi-level analyses

	Work-related autonomy satisfaction		Work-related competence satisfaction		Work-related relatedness satisfaction	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
	Estimate	SE	Estimate	SE	Estimate	SE
Fixed effects						
Intercept	2.40**	0.06	2.39**	0.06	2.41**	0.06
Positive energy before work	0.22**	0.03	0.22**	0.03	0.25**	0.03
Work-related need satisfaction	0.31**	0.05	0.33**	0.05	0.27**	0.05
Need strength	0.20**	0.06	0.10	0.06	0.16**	0.06
Work-related need satisfaction * need strength	0.03	0.05	0.08	0.05	0.15**	0.04
Random effects						
Intercept	0.30**	0.06	0.29**	0.06	0.33**	0.06
Need strength	0.05*	0.02	0.05*	0.02	0.09*	0.04
Intercept, need strength	0.06*	0.03	0.05*	0.03	-0.02	0.03
-2 log	1,908.48	1,908.14	1,911.91	1,909.40	1,922.06	1,911.45
$\Delta -2 \log (df)$		0.34 (1)		2.51 (1)		10.61 (1)**

p* < .05; *p* < .01.

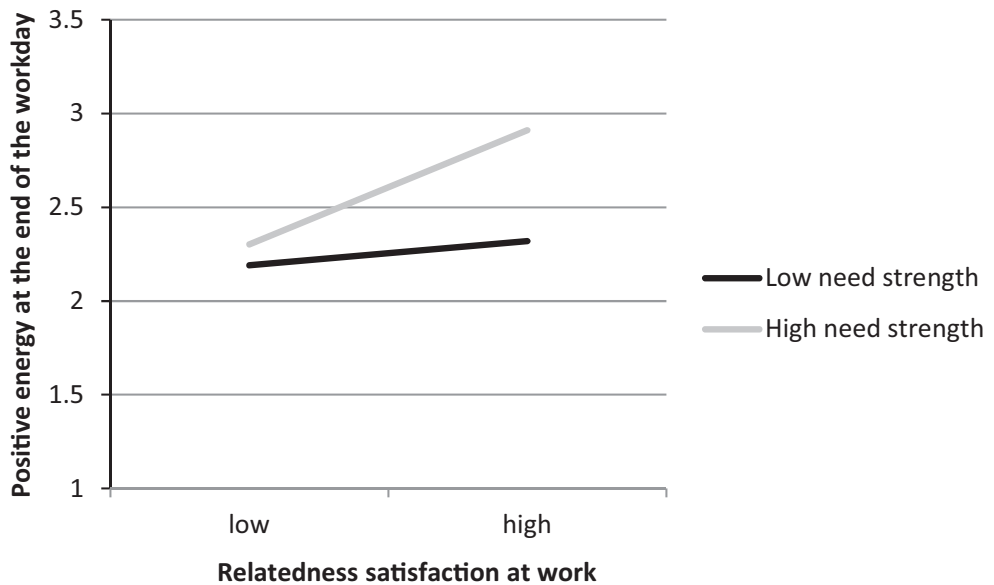


Figure 1. Graphical presentation of interaction between relatedness satisfaction at work and need strength.

interaction between work-related relatedness satisfaction and work-related relatedness need strength in Model 2 resulted in a significant improvement of the model fit. Simple slope analyses (Preacher, Curran, & Bauer, 2006) showed that if need strength is high (1 *SD* above the mean), there is a positive association between need satisfaction and positive energy t_2 (multi-level estimate = 0.44, $p < .01$). If need strength is low (1 *SD* below the mean), this association is not significant (multi-level estimate = 0.10, $p = .15$). A graphical representation of this interaction effect is depicted in Figure 1. All in all, these results support our hypothesis for the work-related satisfaction of the need for relatedness.

Discussion

The current study enhances insight in the role of work-related need satisfaction for employee well-being in two ways. First, to our knowledge, this study is the first to show that the strength of the association between relatedness satisfaction at work and employee well-being depends on the work-related strength of the need for relatedness. We showed that especially the well-being of employees who have the need to feel connected to their colleagues benefit from such relationships at work. This finding supports the matching hypothesis, which proposes that interindividual differences in need strength play a role in the association between need satisfaction and well-being (Schüler *et al.*, 2013).

Second, we found positive associations between both work-related competence and autonomy need satisfaction and employee well-being, which confirms SDT's position that need satisfaction has beneficial effects. Work-related need strength did not moderate the associations between work-related satisfaction of the needs for autonomy and competence and well-being. However, we did find significant slope variance for both of these work-related needs, suggesting that interindividual differences in the magnitude of

the associations between work-related satisfaction of these needs and well-being do exist. Future studies could examine causes for these interpersonal differences.

For practice, our study underlines that it is important that employees are able to satisfy their basic psychological needs at work. Satisfaction of the work-related needs for autonomy and competence seems beneficial for their well-being, irrespective of the strength of these needs. Enabling work-related satisfaction of the need for relatedness is especially important for employees who indicate to have a high need to feel connected to other people at work.

Although previous studies found need for achievement to moderate the association between general need for competence and work-related well-being (Hofer & Busch, 2011; Schüler *et al.*, 2013), we did not find the strength of the need for competence to act as a moderator, and this applied to the strength of the need for autonomy as well. Explanations underlying the differences between the results of our study and those of previous research may be both theoretical and methodological of nature. Theoretically, these results support SDT's position that need strength has no or only a minimal effect on the need satisfaction – well-being relationship (Chen *et al.*, 2015). From a methodological perspective, the composition of our sample may explain the lack of significant interactions for competence and autonomy strength in the current study. Our participants were all interns from a business school, whereas previous research used more heterogeneous samples of working individuals (Hofer & Busch, 2011; Schüler *et al.*, 2013). It is likely that these interns are quite ambitious and, thus, may have a high need to feel competent and autonomous in their work, resulting in a restriction or range in competence and autonomy need strength. Indeed, 95.2% and 89.4% of the participants reported at least a moderate strength of the work-related need for competence and autonomy, respectively.

This study is not without limitations. First, the use of self-reports may have resulted in an overestimation of associations due to common method bias (CMB). That said, it has been shown that CMB does generally not seriously affect the validity of research findings (Fuller, Simmering, Atinc, Atinc, & Babin, 2016).

Second, our study was conducted among a young and highly educated student sample in Asia, which may limit the generalizability of our findings. We recommend that future research replicates our study in countries with a different cultural background and among samples of employees who sufficiently vary in their levels of work-related need strengths.

Third, we used only one indicator of well-being in our study. Although the choice for this indicator was theoretically driven and based on the importance of energy within SDT (Deci & Ryan, 2008), it would be valuable if future studies would examine our hypothesis using additional indicators of well-being (e.g., satisfaction, negative affect).

References

- Baumeister, R., & Leary, M. (1995). The need to belong. Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, *117*, 497–529. <https://doi.org/10.1037/0033-2909.117.3.497>
- Chen, B., Vansteenkiste, M., Beyers, W., Boone, L., Deci, E. L., Van der Kaap-Deeder, J., . . . Ryan, R. M. (2015). Basic psychological need satisfaction, need frustration, and need strength across four cultures. *Motivation and Emotion*, *39*(2), 216–236. <https://doi.org/10.1007/s11031-014-9450-1>
- Deci, E. L. (1975). *Intrinsic motivation*. New York, NY: Plenum. <https://doi.org/10.1007/978-1-4613-4446-9>
- 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*, 319–338. https://doi.org/10.1207/S15327965PLI1104_01

- Deci, E. L., & Ryan, R. M. (2008). Self-determination theory: A macrotheory of human motivation, development, and health. *Canadian Psychology/Psychologie Canadienne*, *49*, 182–185. <https://doi.org/10.1037/a0012801>
- Fisher, C. D., & To, M. L. (2012). Using experience sampling methodology in organizational behavior. *Journal of Organizational Behavior*, *33*(7), 865–877. <https://doi.org/10.1002/job.1803>
- Flunger, B., Pretsch, J., Schmitt, M., & Ludwig, P. (2013). The role of explicit need strength for emotions during learning. *Learning and Individual Differences*, *23*, 241–248.
- Fuller, C. M., Simmering, M. J., Atinc, G., Atinc, Y., & Babin, B. J. (2016). Common methods variance detection in business research. *Journal of Business Research*, *69*, 3192–3198. <https://doi.org/10.1016/j.jbusres.2015.12.008>
- Gregg, V. H., & Shepherd, A. J. (2009). Factor structure of scores on the state version of the four dimension mood scale. *Educational and Psychological Measurement*, *69*(1), 46–156. <https://doi.org/10.1177/0013164408322002>
- Hofer, J., & Busch, H. (2011). Satisfying one's needs for competence and relatedness: Consequent domain-specific well-being depends on strength of implicit motives. *Personality and Social Psychology Bulletin*, *37*(9), 1147–1158.
- Ilies, R., & Judge, T. A. (2005). Goal regulation across time: The effects of feedback and affect. *Journal of Applied Psychology*, *90*, 453–467. <https://doi.org/10.1037/0021-9010.90.3.453>
- McClelland, D. C. (1985). *Human motivation*. Glenview, IL: Scott, Foresman.
- McClelland, D. C., Atkinson, J. W., Clark, R. A., & Lowell, E. L. (1953). *The achievement motive*. New York, NY: Appleton Century Crofts.
- Patrick, H., Knee, C. R., Canevello, A., & Lonsbary, C. (2007). The role of need fulfillment in relationship functioning and well-being: A self-determination theory perspective. *Journal of Personality and Social Psychology*, *92*, 434–457. <https://doi.org/10.1037/0022-3514.92.3.434>
- Preacher, K. J., Curran, P. J., & Bauer, D. J. (2006). Computational tools for probing interactions in multiple linear regression, multilevel modeling, and latent curve analysis. *Journal of Educational and Behavioral Statistics*, *31*(4), 437–448. <https://doi.org/10.3102/10769986031004437>
- 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*, 95–122. <https://doi.org/10.1521/jscp.2010.29.1.95>
- Schüler, J., Brandstätter, V., & Sheldon, K. M. (2013). Do implicit motives and basic psychological needs interact to predict well-being and flow? Testing a universal hypothesis and a matching hypothesis. *Motivation and Emotion*, *37*, 480–495. <https://doi.org/10.1007/s11031-012-9317-2>
- Schultheiss, O. C., & Hale, J. A. (2007). Implicit motives modulate attentional orienting to facial expressions of emotion. *Motivation and Emotion*, *31*(1), 13–24. <https://doi.org/10.1007/s11031-006-9042-9>
- Van den Broeck, A., Ferris, D. L., Chang, C. H., & Rosen, C. C. (2016). A review of self-determination theory's basic psychological needs at work. *Journal of Management*, *42*, 1195–1229. <https://doi.org/10.1177/0149206316632058>
- Van den Broeck, A., Vansteenkiste, M., Witte, H., Soenens, B., & Lens, W. (2010). Capturing autonomy, competence, and relatedness at work: Construction and initial validation of the Work-related Basic Need Satisfaction scale. *Journal of Occupational and Organizational Psychology*, *83*, 981–1002. <https://doi.org/10.1348/096317909X481382>
- Van Hooff, M. L. M., & van Hooft, E. A. J. (2017). Boredom at work: towards a dynamic spillover model of need satisfaction, work motivation, and work-related boredom. *European Journal of Work and Organizational Psychology*, *26*(1), 133–148.
- Van Yperen, N. W., Rietzschel, E. F., & De Jonge, K. M. (2014). Blended working: For whom it may (not) work. *PLoS ONE*, *9*(7), e102921. <https://doi.org/10.1371/journal.pone.0102921>
- Winter, D. G. (1973). *The power motive*. New York, NY: The Free Press.