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Not Extent of Telecommuting, But Job Characteristics as Proximal Predictors of Work-Related Well-Being

Tinne Vander Elst, MSc, PhD, Ronny Verhoogen, MD, Maarten Sercu, MSc, Anja Van den Broeck, MSc, PhD, Elfi Baillien, MSc, PhD, and Lode Godderis, MD, PhD

Objectives: This study aimed to investigate the curvilinear relationship between extent of telecommuting and work-related well-being (ie, burnout, work engagement, and cognitive stress complaints), as well as to test whether job characteristics act as explanatory mechanisms underlying this relationship. **Methods:** A sample of 878 employees from an international telecommunication company with a long history of telecommuting participated in a survey on psychosocial risk factors and well-being at work. Mediation path analyses were conducted to test the hypotheses. **Results:** Social support from colleagues, participation in decision-making, task autonomy, and work-to-family conflict, but not extent of telecommuting, were directly related to work-related well-being. Extent of telecommuting was indirectly related to well-being via social support. **Conclusion:** Employers should invest in creating good work environments in general, among both telecommuters and nontelecommuters.

Advances in communication and information technology have increased the flexibility to work from other places than the traditional office. Telecommuting is defined as ''a work practice that involves members of an organization substituting a portion of their typical work hours to work away from a central workplace—typically principally from home—using technology to interact with others as needed to conduct work tasks.''[1] Prevalence rates of telecommuting up to ca. 80% have been reported, highly depending on the specific type of telecommuting and the sample considered, indicating that it concerns a great number of employees and organizations.[1] For instance, in a predominantly North American sample of rather highly ranked members of WorldatWork—a human resources association—in 2015, 85% telecommuted on an ad hoc basis, whereas 53% worked from home at least one day a week.[2] Work-at-home arrangements may have advantages for multiple parties. It may reduce expenses for the organization to accommodate employees at a central working place. Telecommuting may also reduce travel costs and time for the employee and may help employees to combine their personal responsibilities with their work. Finally, it may also have positive implications for society as a whole, as it may reduce traffic congestions and pollution.[1,3]

In spite of these advantages, controversy remains concerning the implications of telecommuting for employees. First, previous studies have mainly focused on the relationship of telecommuting with attitudes and behaviors directed toward the job or the organization (eg, job satisfaction, productivity),[1,3] neglecting the potential impact on employee health (for exceptions, see, eg, [4,5]). As health is also of utmost importance, in this study, we focus on the health implications of telecommuting.

Second, previous findings on the relationship between telecommuting and various outcomes, such as job satisfaction, organizational commitment, productivity, and (lower) turnover intentions, are rather inconsistent.[1,6] Telecommuting may be beneficial, but the disadvantages (eg, social isolation from coworkers and less involvement and participation in work decisions) may exceed the advantages (eg, more autonomy and combining work and personal life) when employees are working from home for most part of the working time.[6–8] Hence, the extent or intensity of telecommuting, operationalized for instance by the number of days of telecommuting a week,[8] might play an important role.[9,10] Golden and Veiga[6] offered initial evidence of an inverted U-shaped relationship between extent of telecommuting and job satisfaction. In this study, we adopt this innovative approach and will investigate the curvilinear relationship between extent of telecommuting and work-related well-being.

Third, few studies have addressed the reasons *why* telecommuting is related to employee health. This is an important question, especially in light of health promotion and theory development on the impact of telecommuting. It concerns the mediating mechanisms through which telecommuting is indirectly related to work-related well-being. Several proximal outcomes of telecommuting have been identified as mediators.[3,4,7,11] First, telecommuting may increase both social and professional isolation,[1,9] for instance reflected in reduced social support from colleagues[3,4,7] and participation in decision-making. Besides, it may relate to higher levels of job autonomy, as telecommuters have more control over the time and place of work and more freedom to perform their work following their own preferences.[3,4,11] Scholars seem to describe these relationships as linear associations: the higher the extent of telecommuting, the more social isolation and autonomy experienced.[1,4,9] In contrast, extent of telecommuting may relate to work-to-family conflict (WFC) in a curvilinear way: although telecommuting has been presented as a way to aid employees in combining their work with their potential family roles and may thus decrease WFC,[1,3,12] it may also diminish the boundaries between one's work and family life and thus make (psychological) detachment from work at home more difficult when performed in an excessive way.[3] In turn, these proximal outcomes of telecommuting may further affect employee health and well-being, as widely agreed upon and described in various work stress theories.[13–16] For instance, following the Job Demands-Resources model,[13,14] social support from colleagues, participation in decision-making, and task autonomy may act as job resources stimulating work-related well-being, whereas WFC is conceived as a job demand deteriorating well-being. Taken together, extent of telecommuting may thus indirectly be related to work-related well-being through various mediating job characteristics.

In line with this reasoning, Sardeshmukh et al[4] found several job resources (ie, social support, autonomy, feedback) and demands

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(ie, time pressure, role ambiguity, role conflict) to mediate the relationship between extent of telecommuting, and emotional exhaustion and work engagement. In addition, Gajendran and Harrison[3] provided meta-analytical evidence on the mediating role of perceived relationship quality, autonomy and WFC in the relationship between telecommuting and role stress (including stress complaints/distress). However, to our knowledge, no previous studies have examined the explanatory mechanisms of the extent of telecommuting–health relationship allowing the paths (eg, from extent of telecommuting to mediators and outcomes) to be nonlinear (but see[7] for evidence regarding the outcome job satisfaction).

The main aim of this study is to test the relationship between extent of telecommuting and work-related well-being (ie, burnout, work engagement, and cognitive stress complaints), and to examine whether job characteristics (ie, social support from colleagues, participation in decision-making, task autonomy, and WFC) may explain this relationship (ie, a test of mediation or indirect effects). Although we predict curvilinear relationships between extent of telecommuting and work-related well-being as well as WFC, we propose linear relationships between extent of telecommuting and social support from colleagues, participation in decision-making and task autonomy, and between all job characteristics and work-related well-being. Our predictions are displayed in Fig. 1.

METHODS

Data Collection and Respondents

Data were collected in 2014 among the employees of the Belgian branch of an international telecommunication company. Employees' work activities mainly entail computer work and collaborations with team members located abroad, with many conference calls at moments before and after the regular office hours. Telecommuting highly facilitates this kind of irregular work, and therefore, it was introduced in 2001 and rapidly adapted as a common practice since.

One thousand four hundred seventy-eight employees were invited by e-mail to participate in an online survey on psychosocial risk factors and well-being at work. First, respondents were informed about the voluntary character of the survey and the anonymous treatment of the data, and were explicitly asked whether they agreed with the privacy statement. Only after giving their informed consent, they were given access to the questionnaire. In total, 878 employees completed the questionnaire (response rate of 59.4%). Respondents' mean age was 45.14 years (SD = 8.59), 83.0% was male, and 19.5% of the respondents had a supervising position.

This project has been approved by ethical commission OG117 and was carried out according to the Belgian and international privacy and ethical legislation, allowing posthoc analyses of anonymized data obtained during occupational health surveillance and risk analysis.

Measurements

Extent of telecommuting was measured with a single item: ''How many days a week do you on average work from home?'' (1 = I never work from home; 2 = Less than 1 day a week; 3 = 1 day a week; 4 = 2 days a week; 5 = 3 days a week; 6 = 4 days a week; 7 = 5 days a week). This item closely resembles other measurements of extent of telecommuting.[8]

All other study variables were assessed using (items from) internationally validated scales. Social support from colleagues was measured by means of the original two-item scale from the Short Inventory to Monitor Psychosocial Hazards.[17] An item example is

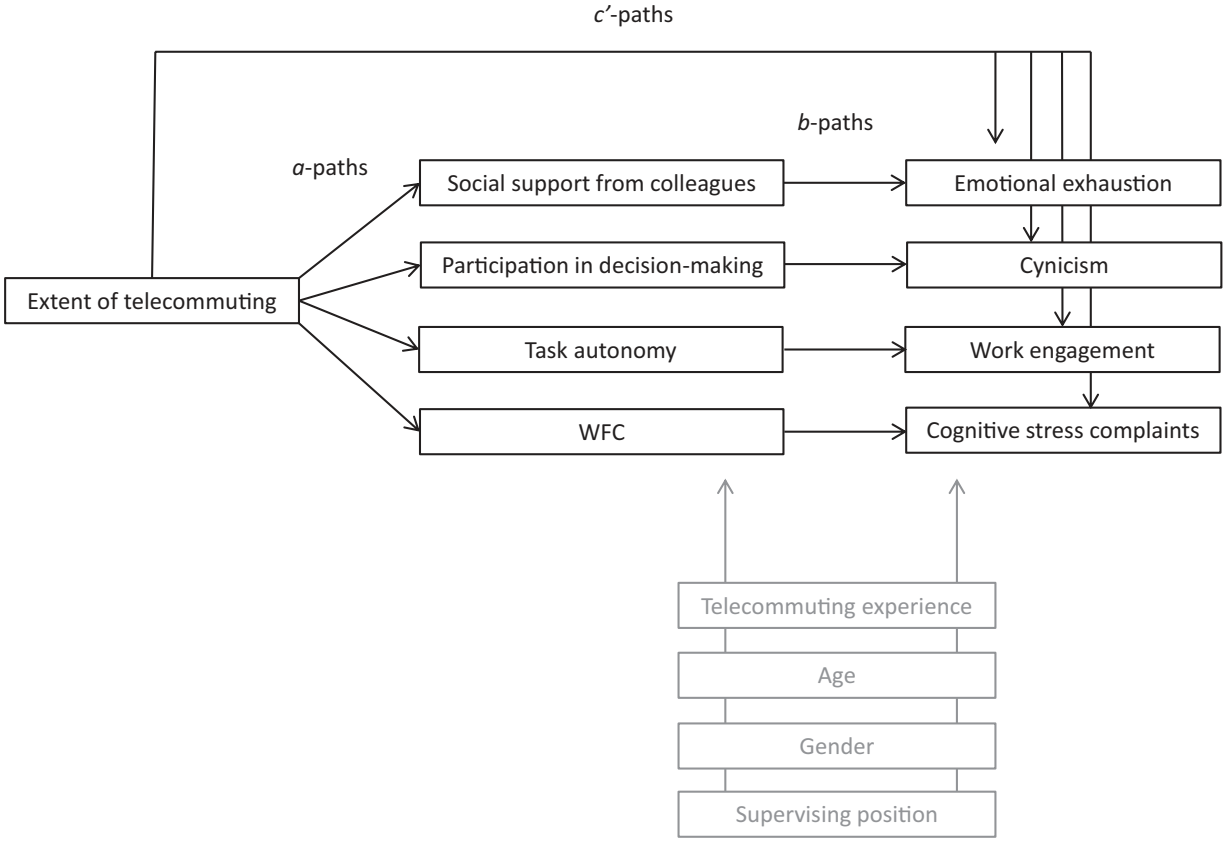

FIGURE 1. Theoretical model.

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''If necessary, I can ask my colleagues for help.'' Participation in decision-making was measured using the involvement scale of Patterson et al[18] (eg, ''Management involve people when decisions are made that affect them''), omitting the two items concerning communication. Next, task autonomy was measured using a selection of three items from Baillien et al,[19] for instance, ''I can plan my own work.'' Work-family conflict (WFC) was measured with a single item measure from the General Nordic Questionnaire for Psychological and Social Factors at Work[20]; ''the demands of my work interfere with my home and family life,'' which was slightly adapted to match the format in which the other items were presented (original item: ''Do the demands of your work interfere with your home and family life?''). These scales were rated on a five-point Likert scale ranging from 1 [*(almost) never*] to 5 [*(almost) always*].

With respect to work-related well-being, burnout was measured with the original emotional exhaustion (five items; eg, ''I feel mentally exhausted because of my work'') and cynicism subscales (four items; eg, ''I have become more cynical about the effects of my work'') of the general version of the Utrecht Burnout Scale (UBOS-A).[21] Next, work engagement was measured by means of the original nine-item Utrecht Work Engagement Scale (UWES),[22] tapping into vigor (eg, ''At my work, I feel bursting with energy''), dedication (eg, ''I am enthusiastic about my job'') and absorption (eg, ''I get carried away when I'm working''). Respondents were requested to score the items of the emotional exhaustion, cynicism, and work engagement scales on a seven-point scale from 1 (*never*) to 7 (*always/every day*). Finally, cognitive stress complaints were measured with the original cognitive stress scale from the Copenhagen Psychosocial Questionnaire (COPSOQ; eg, ''How often have you had problems concentrating?'').[23] The items of the COPSOQ were rated on a five-point Likert scale ranging from 1 [*(almost) never*] to 5 [*(almost) always*].

Statistical Analyses

Before the hypothesis testing, we evaluated the factor structure of our measurements by means of confirmatory factor analysis (CFA) using the statistical package MPlus, version 7.4 (Mac), (Muthén & Muthén Los Angeles, CA).[24]

Next, hypotheses were tested using path analysis in MPlus, version 7.4,[24] following the approach presented by Hayes and Preacher[25] for testing indirect effects when the constituent paths are nonlinear. Specifically, we modeled linear relationships from extent of telecommuting to social support from colleagues, participation in decision-making and task autonomy (*a*-paths), and from all job characteristics to all indicators of well-being (*b*-paths). Curvilinear (or exponential) relationships, in addition to linear relationships, were modeled from extent of telecommuting to WFC (*a*-path) and all indicators of work-related well-being (*c'*-paths). Social support from colleagues, participation in decision-making, task autonomy, and WFC were allowed to covary, as were emotional exhaustion, cynicism, work engagement, and cognitive stress complaints. We controlled for the possible effects of several covariates (ie, telecommuting experience: 1 = less than 1 year, 2 = 1 to 5 years, 3 = more than 5 years; age: years; gender: 0 = female, 1 = male; and supervising position: 0 = no, 1 = yes) by adding them as predictors of the endogenous variables (ie, job characteristics and indicators of work-related well-being).

Indirect effects were estimated using a product-of-coefficients approach. We estimated linear indirect effects of extent of telecommuting on the indicators of work-related well-being through social support from colleagues, participation in decision-making, and task autonomy, as all constituent relationships were linear (ie, linear *a*-paths from extent of telecommuting to social support from colleagues, participation in decision-making and task autonomy; and linear *b*-paths from these job characteristics to the indicators of work-related well-being). However, instantaneous indirect effects, referring to indirect effects at a certain value of the predictor,[25] were calculated to test whether the effect of extent of telecommuting on the indicators of work-related well-being went through WFC. The reason is that the relationship from extent of telecommuting to WFC (ie, *a*-path) was predicted to be nonlinear, while the relationship between WFC and the outcomes (ie, *b*-paths) was linear, implying that the indirect effect of extent of telecommuting on the outcomes through WFC not only depends on the *a*- and *b*-paths but also on extent of telecommuting. Bootstrap 95% confidence intervals (with 10.000 bootstrap samples) were calculated for inference regarding the direct and indirect paths. The bootstrapping procedure is recommended when testing for mediation or indirect effects, as it does not require normality of the sampling distribution of the indirect effects.[25]

In all CFAs and path analyses, the Maximum Likelihood estimator was used. Model fit was evaluated using the comparative fit index (CFI), the non-normed fit index (NNFI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR).

RESULTS

Descriptive Results

The vast majority of the respondents telecommuted occasionally (95.6%): only 4.4% never worked from home; 27.7% worked from home less than one day a week; 35.2% telecommuted one day a week; 23.2% two days a week; 6.3% three days a week; 2.4% four days a week; and 0.8% always worked from home. Most respondents had experience with telecommuting for some time: 6.6% had experience with telecommuting less than 1 year; 36.7% between 1 and 5 years; and 56.7% had experience for more than 5 years.

Table 1 presents the means, standard deviations, reliabilities (ie, Cronbach alpha coefficients), and correlations for the study scales. Extent of telecommuting was negatively related to social support from colleagues and participation in decision-making. Unexpectedly, it was unrelated to the other job characteristics and indicators of work-related well-being under study. The job characteristics associated with the well-being indicators in the expected direction. Social support, participation in decision-making, and task autonomy correlated negatively with emotional exhaustion, cynicism, and cognitive stress complaints and positively with work engagement. WFC was positively related to emotional exhaustion, cynicism, and cognitive stress complaints and negatively to work engagement.

Test of Measurement Model

A series of CFAs demonstrated the expected dimensionality of the study variables (ie, extent of telecommuting, social support from colleagues, participation in decision-making, task autonomy, WFC, emotional exhaustion, cynicism, work engagement, and cognitive stress complaints). The hypothesized nine-factor measurement model fitted the data reasonably well (CFI = 0.92; NNFI = 0.91; RMSEA = 0.06; SRMR = 0.04), and showed a better fit in comparison with three alternative measurement models: (1) a six-factor model in which all job characteristics were clustered within one factor [CFI = 0.86; NNFI = 0.84; RMSEA = 0.08; SRMR = 0.08; $\Delta Chi^2(20) = 1113.06$, $P < 0.001$]; (2) a six-factor model in which all indicators of work-related well-being were taken together as one factor [CFI = 0.67; NNFI = 0.64; RMSEA = 0.11; SRMR = 0.10; $\Delta Chi^2(21) = 4418.79$, $P < 0.001$]; and (3) a one-factor model in which all items loaded on a general factor [CFI = .52; NNFI = .49; RMSEA = .14; SRMR = .12; $\Delta Chi^2(34) = 7062.49$, $P < 0.001$].

Testing Direct and Indirect Relationships

The results of the mediation path analysis are presented in Table 2. Overall, our model (Fig. 1) fitted the data well

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TABLE 1. Means, Standard Deviations, Reliabilities (Cronbach Alpha Coefficients in Parentheses), and Bivariate Correlations for Extent of Telecommuting, the Job Characteristics, and the Indicators of Work-Related Well-Being ($N = 878$)

Study Variable	Scale	M	SD	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Extent of telecommuting	1–7	3.10	1.13	(na)	−0.09**	−0.07*	0.05	0.05	0.05	0.06	−0.03	−0.05
2. Social support from colleagues	1–5	3.92	0.68		(0.57)	0.32***	−0.21***	0.27***	−0.25***	−0.32***	0.26***	−0.18***
3. Participation in decision-making	1–5	2.94	0.81			(0.88)	−0.29***	0.32***	−0.24***	−0.38***	0.28***	−0.18***
4. Task autonomy	1–5	3.59	0.66				(0.77)	−0.14***	−0.24***	−0.25***	0.36***	−0.18***
5. Work-to-family conflict	1–5	2.61	0.99					(na)	0.34***	0.23***	−0.13***	0.23***
6. Emotional exhaustion	1–7	2.53	1.18						(0.89)	0.67***	−0.41***	0.51***
7. Cynicism	1–7	2.29	1.21							(0.88)	−0.55***	0.43***
8. Work engagement	1–7	4.97	1.24								(0.94)	−0.32***
9. Cognitive stress complaints	1–5	2.42	0.71									(0.83)

na, not applicable.
*$P < 0.05$.
**$P < 0.01$.
***$P < 0.001$.

(CFI = 0.997; NNFI = 0.93; RMSEA = 0.04; SRMR = 0.002). In line with our expectations, extent of telecommuting was negatively related to social support from colleagues (ie, *a*-path). However, in contrast with our predictions, we did not find evidence for a linear relationship between extent of telecommuting and both participation in decision-making and task autonomy, nor did we find a significant curvilinear relationship between extent of telecommuting and WFC (ie, *a*-paths). In addition, the direct curvilinear paths from extent of telecommuting to emotional exhaustion, cynicism, work engagement, and cognitive stress complaints were also not found to be significant (ie, *c'*-paths).

The job characteristics related to the indicators of work-related well-being in an expected way, with some exceptions (ie, *b*-paths). Social support from colleagues and task autonomy were negatively associated with emotional exhaustion, cynicism, and cognitive stress complaints, and positively with work engagement. Participation was negatively related to cynicism and positively to work engagement, but did not relate to emotional exhaustion and cognitive stress outcomes. Finally, WFC related positively to the negative indicators of work-related well-being, but was unrelated to work engagement.

Finally, the tests of the indirect effects showed that extent of telecommuting was indirectly related with emotional exhaustion, cynicism, work engagement, and cognitive stress complaints only through social support from colleagues. The other linear (via participation in decision-making and task autonomy) and instantaneous indirect effects (via WFC for low, average, and high scores of extent of telecommuting) were not significant.

DISCUSSION

Unexpectedly, extent of telecommuting—operationalized as the number of days of homework a week—did not directly relate to work-related well-being. Specifically, we did not find a direct *curvilinear* relationship between extent of telecommuting on the one hand and two dimensions of burnout (emotional exhaustion and cynicism), work engagement, and cognitive stress complaints on the other hand. Also, no evidence was found for the direct *linear* relationships between extent of telecommuting and these indicators of work-related well-being. Although previous findings on the effect of telecommuting on employee functioning are rather inconsistent,[6] our results contradict some studies demonstrating the relationship between (extent of) telecommuting and lower levels of exhaustion and higher levels of work engagement.[4,5] A potential explanation of the lack of a relationship lies in the underlying explanatory mechanisms that may hold contrasting indirect effects of extent of telecommuting on work-related well-being outcomes: for instance, telecommuting may reduce employee health through reduced social support and participation in decision-making, but may enhance health via higher levels of task autonomy and lower WFC (up to a certain extent of telecommuting).

However, this assumption was not supported by our results either. The tests of the mediation effects showed that extent of telecommuting related to the four outcomes indirectly, although only via (lower levels of) social support by one's colleagues. Employees telecommuting more days a week reported less social support from their colleagues, which in turn was associated with higher levels of emotional exhaustion, cynicism, and cognitive stress complaints and lower levels of work engagement. This corresponds with previous findings of Sardeshmukh et al,[4] who found social support to mediate the relationship between extent of telework and both exhaustion and work engagement, as well as with many other studies highlighting the negative relationship between telecommuting and social support.[3] Unexpectedly, extent of telecommuting did not relate to participation in decision-making, WFC, and task autonomy (in a linear or curvilinear way). Although we could not find previous evidence on the specific relationship between extent of telecommuting and participation in decision-making, these results contradict studies highlighting the association of extent of telecommuting, and autonomy and WFC.[3,7] Our results thus imply that telecommuting does not necessarily hold a fundamental change in the way people work, in contrast with previous positions.[10] Whether telecommuting really changes the nature of work may depend on how telecommuting is organized and which organizational practices are provided to facilitate work-at-home arrangements. This study was conducted in an organization in which telecommuting was rather well established with structural solutions to organize telecommuting in practice, and hence, possible effects of extent of telecommuting on work characteristics might have been erased. Nevertheless, good telecommuting practices and technologies might not always be sufficient to replace face-to-face contact with colleagues, as stated previously[4,26] and highlighted by our study results.

Unlike extent of telecommuting, the job characteristics did predict work-related well-being: higher levels of social support, participation in decision-making, and task autonomy related to lower levels of emotional exhaustion, cynicism, and cognitive stress complaints and higher levels of work engagement (with few exceptions), and WFC related to higher levels of emotional exhaustion, cynicism, and cognitive stress. These results correspond with stress theories and previous findings.[13–16] Following the Job Demands-Resources model,[13,14] for instance, job resources such as social support from colleagues, participation in decision-making, and task

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TABLE 2. Results of the Mediation Path Analysis ($N = 878$)

	Endogenous Variables							
	Social Support from Colleagues		Participation in Decision-Making		Task Autonomy		Work-to-Family Conflict	
Predictors	Unstand. Coeff. (SE)	95% CI	Unstand. Coeff. (SE)	95% CI	Unstand. Coeff. (SE)	95% CI	Unstand. Coeff. (SE)	95% CI
Paths from Telework and Covariates to Job Characteristics (a-Paths)								
Extent of telecommuting	−0.07 (0.02)**	[−0.106 to −0.025]	−0.05 (0.03)	[−0.098 to 0.001]	0.02 (0.02)	[−0.020 to 0.063]	−0.05 (0.13)	[−0.292 to 0.203]
Extent of telecommuting^2	na	na	na	na	na	na	0.01 (0.02)	[−0.024 to 0.045]
Telecommuting experience	0.13 (0.04)**	[0.055–0.212]	0.02 (0.05)	[−0.074 to 0.110]	0.07 (0.04)	[−0.005 to 0.148]	0.15 (0.06)*	[0.026–0.263]
Age	−0.01 (0.00)**	[−0.015 to −0.004]	−0.01 (0.00)**	[−0.016 to −0.003]	0.00 (0.00)	[−0.006 to 0.004]	0.00 (0.00)	[−0.006 to 0.009]
Gender (Male)	0.09 (0.07)	[−0.047 to 0.228]	0.07 (0.07)	[−0.069 to 0.208]	0.14 (0.06)*	[0.024–0.266]	0.12 (0.09)	[−0.057 to 0.299]
Supervising position	−0.06 (0.06)	[−0.177 to 0.043]	0.05 (0.06)	[−0.077 to 0.165]	0.26 (0.05)***	[0.163–0.360]	0.25 (0.08)**	[0.088–0.410]

	Emotional Exhaustion		Cynicism		Work Engagement		Cognitive Stress Complaints	
	Unstand. Coeff. (SE)	95% CI	Unstand. Coeff. (SE)	95% CI	Unstand. Coeff. (SE)	95% CI	Unstand. Coeff. (SE)	95% CI
Paths from Telework, Job Characteristics, and Covariates to Indicators of Work-Related Well-being (c'- and b-Paths)								
Extent of telecommuting	−0.03 (.15)	[−0.332 to 0.251]	−0.06 (0.14)	[−.343 to .209]	−0.20 (0.15)	[−0.473 to 0.104]	−0.07 (0.09)	[−0.249 to 0.104]
Extent of telecommuting^2	0.01 (.02)	[−0.030 to 0.048]	0.01 (0.02)	[−.025 to .052]	0.02 (0.02)	[−0.017 to 0.061]	0.00 (0.01)	[−0.020 to 0.027]
Social support from colleagues	−0.24 (.06)***	[−0.369 to −0.114]	−0.35 (0.07)***	[−.484 to −.220]	0.27 (0.07)***	[0.144–0.397]	−0.11 (0.04)**	[−0.187 to −0.031]
Participation in Decision-Making	−0.11 (.06)	[−0.222 to 0.006]	−0.40 (0.06)***	[−.510 to −.290]	0.23 (0.06)***	[0.115–0.349]	−0.06 (0.03)	[−0.131 to 0.000]
Task autonomy	−0.22 (.07)**	[−0.348 to −0.091]	−0.19 (0.07)**	[−.323 to −.051]	0.49 (0.07)***	[0.356–0.617]	−0.09 (0.04)*	[−0.164 to −0.005]
Work-to-family conflict	0.34 (.04)***	[0.245–0.418]	0.12 (0.04)**	[.033–.201]	−0.03 (0.04)	[−0.113 to 0.056]	0.13 (0.03)***	[0.079–0.182]
Telecommuting experience	0.01 (.07)	[−0.129 to 0.144]	0.10 (0.07)	[−.039 to .238]	0.03 (0.07)	[−0.107 to 0.162]	0.04 (0.05)	[−0.057 to 0.119]
Age	−0.01 (.00)	[−0.016 to 0.001]	−0.01 (0.01)	[−.015 to .003]	0.01 (0.01)	[0.000–0.019]	0.00 (0.00)	[−0.003 to 0.008]
Gender (Male)	0.08 (.09)	[−0.096 to 0.259]	0.20 (0.09)*	[.017–.365]	−0.23 (0.10)*	[−0.431 to −0.023]	−0.01 (0.06)	[−0.132 to 0.107]
Supervising position	−0.22 (.09)*	[−0.399 to −0.051]	−0.10 (0.09)	[−.285 to .071]	0.19 (0.09)*	[0.011–0.372]	−0.22 (0.06)***	[−0.324 to −0.106]
Indirect Relationships from Extent of Telecommuting to Indicators of Work-Related Well-being via Job Characteristics								
Linear indirect effect via social support from colleagues	0.02 (0.01)*	[0.006–0.032]	0.02 (0.01)**	[0.009–0.042]	−0.02 (0.01)*	[−0.036 to −0.006]	0.01 (0.00)*	[0.002–0.016]
Linear indirect effect via participation in decision-making	0.01 (0.00)	[0.000–0.017]	0.02 (0.01)	[0.000–0.042]	−0.01 (0.01)	[−0.028 to −0.001]	0.00 (0.00)	[0.000–0.010]
Linear indirect path via task autonomy	−0.01 (0.01)	[−0.017 to 0.003]	0.00 (0.00)	[−0.016 to 0.003]	0.01 (0.01)	[−0.009 to 0.032]	0.00 (0.00)	[−0.008 to 0.001]
Instantaneous indirect effect via WFC at low levels of telecommuting	0.00 (0.01)	[−0.014 to 0.015]	0.00 (0.01)	[−0.017 to 0.015]	0.00 (0.00)	[−0.009 to 0.010]	0.00 (0.01)	[−0.017 to 0.016]
Instantaneous indirect effect via WFC at average levels of telecommuting	0.00 (0.00)	[−0.012 to 0.004]	0.00 (0.00)	[−0.004 to 0.013]	0.00 (0.00)	[−0.009 to 0.002]	0.00 (0.00)	[−0.005 to 0.012]
Instantaneous indirect effect via WFC at high levels of telecommuting	−0.01 (0.01)	[−0.018 to 0.002]	0.01 (0.01)	[−0.002 to 0.020]	0.00 (0.00)	[−0.013 to 0.001]	0.01 (0.01)	[−0.003 to 0.018]

na, not applicable; WFC, work-to-family conflict.
*$P < 0.05$.
**$P < 0.01$.
***$P < 0.001$.

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autonomy stimulate work-related well-being, whereas job demands such as WFC decrease well-being.

Overall, in the present study, the job characteristics social support from colleagues, participation in decision-making, task autonomy, and WFC, but not extent of telecommuting, were found to be proximal predictors of work-related well-being. Extent of telecommuting was a distal predictor of work-related well-being, but only via social support from colleagues. Our results seem to suggest that not the extent of telecommuting, but rather the way in which the job—including telecommuting—is characterized (eg, level of autonomy, contact with colleagues), is predictive of employee well-being. Hence, we suggest future researchers to focus on other characteristics/practices of the job and of telecommuting that might play a role in predicting work-related well-being, such as the availability of supporting technologies, a calm work environment at the office versus at home, and the nature of work (eg, consultancy, meetings vs administration, writing).

Strengths and Limitations

This study offered an important contribution by meeting several calls that have been made in the literature on telecommuting, namely the call to examine the extent of telecommuting rather than focusing on telecommuting per se (yes or no),[1] the call to investigate health outcomes of telecommuting,[1] the more implicit call to explore curvilinear relationships between telecommuting and certain outcomes,[6] and the call to investigate the underlying mechanisms through which telecommuting results in particular outcomes.[3,9] In addition, hypotheses were tested in a relatively large sample of employees ($N = 878$) from an organization where work-at-home arrangements are grounded in the organization's work processes for more than 10 years. As such, this organization offers a good context to evaluate the impact of telecommuting on employee health.

However, limitations of this study should be mentioned. First, the cross-sectional nature of the study prevents us from drawing conclusions about the direction and causal nature of the relationships under study. Work characteristics may affect employee well-being, but there might also be a reverse effect from well-being to perceptions of the work environment.[27] Future research using longitudinal cross-lagged designs may investigate the direction of relationships. Second, this study was based on self-reports, increasing the risk of common method variance possibly inflating the magnitude of the relationships.[28] Future studies using other kinds of measurements, such as objective measures (eg, extent of telecommuting based on official records) or perceptions of external evaluators (eg, a physician's evaluation of employee health), may solve this issue. Third, we found a rather low reliability for the two-item scale of social support from colleagues. Future research using scales with more items should replicate our results. Finally, this study was conducted in the specific context of a telecommunication company with a long history of telecommuting. Studies with more heterogeneous samples might further explore the generalizability of our findings, while controlling for multiple organizational telecommuting practices.

Conclusion and Practical Considerations

Extent of telecommuting was not found to be a proximal predictor of work-related well-being, but social support from colleagues, participation in decision-making, task autonomy, and WFC were. These results suggest that, to safeguard work-related well-being of both telecommuting and nontelecommuting employees, employers benefit from creating a work environment that includes adequate levels of social support between coworkers, employee participation in decision-making, and task autonomy. In addition, employers should avoid practices that may encourage WFC. A recurrent risk assessment mapping the level of these aspects among the employees could inform employers about whether or not action is required.[29]

Nevertheless, the results support the possibility that employees' experienced social support from colleagues is lower when they telecommute more frequently. This means that employers may best consider a balance between telecommuting—which is generally rendered through computer-mediated communication systems (CMCS) yielding a less personal type of communication—and traditional face-to-face contact in the employee's job design (for a discussion, see [30]). Still coming to the office and having face-to-face interactions on a regular basis seem important, as it might facilitate greater social belonging and interaction enjoyment.[31] In addition, although not as effective as personal contact,[31] organizations may stimulate qualitative virtual interaction with coworkers by providing robust online meeting tools and infrastructure so users can seamlessly collaborate regardless of their physical location.

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