DISCUSSION PAPER SERIES

Too Much of a Good Thing? Telework Intensity and Workplace Experiences

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ABSTRACT

Too Much of a Good Thing? Telework Intensity and Workplace Experiences*

At a time when numerous organisations are urging a return to the office while many employees prefer to continue teleworking, it is crucial to ascertain the optimal level of telework intensity. In the present study, we determine this ideal level with respect to self-rated employee attitudes, behaviour, well-being, social relations and professional growth. Drawing on a five-wave longitudinal dataset, we apply fixed effects regression analyses to investigate associations between telework intensity and various dimensions of workplace experience. We offer more robust empirical evidence for favouring hybrid work schedules over an office-only or telework-only regime owing to significant advances in causal interpretation of linear and non-linear associations compared to the majority of existing studies that examine linear associations based on cross-sectional data. Our results point toward an inverted U-shaped association between telework intensity and self-rated job satisfaction, work-life balance, relationships with colleagues and professional development, with optimal levels peaking around 50% teleworking. For task efficiency and work concentration, the association appears to be concave with a plateau, stabilising at teleworking levels above 70%. Only between telework intensity and employer connectedness do we observe a slightly negative linear association.

JEL Classification:	I31, J24, J28, J32, J81, M51
Keywords:	telework intensity, workplace experience, hybrid work schedules, longitudinal

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1. Introduction

Teleworking became the primary mode of employment for many employees during the COVID-19 pandemic (Gajendran et al., 2024; Moens et al., 2024a). Today, several prominent organisations are urging their employees to return to the office, while numerous employees on the contrary desire to continue teleworking in the post-pandemic context (Gajendran et al., 2024). Because of this divide between employers and employees over the adoption of telework, it is important to examine the optimal telework intensity in relation to employees' aspirations. In particular, it is crucial to understand the link between this intensity and self-rated employee attitudes, behaviour, well-being, social relations and professional growth (Gajendran & Harrison, 2007; Gajendran et al., 2024). Early literature on telework has often overlooked the aspect of telework intensity (Allen et al., 2015). However, recent studies underscore its importance, suggesting a shift in focus from the dichotomy of teleworking versus not teleworking (i.e., the extensive margin of teleworking) to examining how variations in telework intensity impact workplace experiences (i.e., the intensive margin of teleworking; Gajendran et al., 2024; Urien, 2023). Also, in other recent studies, the concepts of 'hybrid working schedules' (referring to the appropriate amount of teleworking, i.e., a schedule with the best fit between telework and on-site work) emerge, yet they lack solid scientific grounds (Bloom et al., 2024; Urien, 2023).

Research explicitly focusing on the impact of telework intensity on self-rated employee dimensions of workplace experience remains in its early stages. However, some important studies in this area were published recently. The first significant study is the meta-analysis by Gajendran et al. (2024), which demonstrates that telework intensity has overall small but beneficial associations with several key employee perceptions, such as job satisfaction. Importantly, they do not report any negative associations between telework intensity and the investigated employee perceptions, including workplace relationships and well-being. However, like much of the existing literature, their study suffers from two primary limitations. First, the impact of telework intensity on workplace experiences is rarely studied longitudinally, as the data of the vast majority of the studies have been collected at a single point in time using cross-sectional designs (Bentley et al., 2016; Gajendran et al., 2024; Lass & Wooden, 2023; Reboul, 2023; Rudolph & Zacher, 2024; Sutarto et al., 2022). The

longitudinal component is vital, however, because cross-sectional data without (quasi-)experimental variation is limited in inferring causal relationships, while longitudinal analyses can at least control for unobserved time-invariant confounders (Choi, 2020; Moens et al., 2024b). Second, much of the past research primarily explored linear relationships despite indications that the positive associations between telework and various employee perceptions diminish—or even turn negative—at very high levels of telework intensity (Allen et al., 2015; Gajendran & Harrison, 2007; Golden & Veiga, 2005; Golden, 2006; Rudolph & Zacher, 2024; Urien, 2023; Virick et al., 2010). These limitations contribute to the mixed findings observed in the existing literature (Gajendran et al., 2024; Rudolph & Zacher, 2024).

Therefore, the scarce recent studies that longitudinally examine non-linear relationships between telework intensity and self-rated employee perceptions are important contributions to the literature (Huo et al., 2024; Park et al., 2023; Reboul et al., 2023; Rudolph & Zacher, 2024). Unfortunately, these studies do not give a consistent or complete view of the topic. The frameworks provided by Gajendran and Harrison (2007) and Gajendran et al. (2024) offer a comprehensive grouping of telework consequences into attitudinal, behavioural, well-being, relational and growth perceptions. To fully assess the impact of telework intensity, all these dimensions should be represented. However, of these dimensions, only the non-linear association of telework intensity with 'work-life balance' and 'job satisfaction' have been individually examined (and empirically affirmed) based on a longitudinal dataset (Reboul et al., 2023; Rudolph and Zacher, 2024).[1] Consequently, a study that relies on longitudinal data to provide a comprehensive overview of how telework intensity impacts all relevant dimensions of workplace experience, taking into account non-linear associations, would constitute a valuable contribution to the literature.

Therefore, based on a five-wave longitudinal dataset, the present study investigates

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[1] Huo et al. (2024) and Park et al. (2023) focus on a limited set of outcome variables, work engagement and innovative and counterproductive work behavior, respectively. Although Rudolph and Zacher (2024) investigate a broad set of perceptions, the set of investigated outcomes still omits several dimensions frequently discussed in the literature on telework consequences. Specifically, the study omits critical perceptions such as 'work-life balance', essential to the well-being dimension, and 'employer connectedness', central to the attitudinal dimension. Furthermore, they focus on the efficacy aspect of performance (belonging to the behavioural dimension), while key productivity measures such as 'task efficiency' and 'work concentration' are not addressed. Additionally, their examination of professional isolation as a higher-order construct combines relational components (e.g., relationships with colleagues) with growth-related items. This aggregation obscures insights into the specific subdimensions of professional isolation with potentially distinct relationships pertaining to telework intensity (Sahai et al., 2020).

linear and non-linear associations between telework intensity and self-rated employee attitudes, behaviour, well-being, social relations and professional growth. More specifically, we examine whether the associations between telework intensity and the following perceptions are non-linear: i) 'job satisfaction' (attitudinal), ii) 'employer connectedness' (attitudinal), iii) 'task efficiency' (behavioural), iv) 'work concentration' (behavioural), v) 'work-life balance' (well-being), vi) 'relationship with colleagues' (relational), vii) 'promotion chances' (professional growth) and viii) 'professional development' (professional growth). Based on the existing literature discussed above, we expect the association of telework intensity with 'job satisfaction' and 'work-life balance' to follow a non-linear pattern.

The subsequent sections of this article unfold as follows. We proceed with a section on the data used in the study, providing information on the research sample and the measured variables. In the next section, we give more extensive information on the method. In particular, we explain why we employ fixed effects analyses, and we describe the specifications. This section is followed by the results, where we detail the evidence for labelling associations as linear or non-linear. We end with a general conclusion, discussing the limitations of our study and offering suggestions for further research.

2. Data

To compose a longitudinal dataset to test our hypotheses, we built further on the data of Moens et al. (2022). In light of this study, Ghent University launched a survey between 25 March 2020 and 31 March 2020 among employees in Flanders (Belgium) on their perceptions of telework in terms of various life and career aspects. All respondents from this base study who were willing to participate in follow-up research and with valid e-mail addresses (n=3,444) constituted the respondent 'pool' we invited to participate in four follow-up surveys. The data collection process for the current research is visualised in Figure 1.

<Figure 1 about here>

The first wave of our current research (n=2,620) consisted of all respondents from this

'pool' that passed two conditions. First, they should have been able to telework at least 10% of their working time since the study required them to evaluate the career consequences of telework. Second, they should have met certain practical conditions, such as providing informed consent, passing the attention check and not being older than 65 (i.e., the retirement age of the economically active population in Belgium at the time).

All respondents from the 'pool' (n=3,444) were invited by Antwerp Management School to participate in a follow-up survey in March 2021. On the condition of having performed telework in the past year and meeting the aforementioned practical requirements, 553 participants qualified for the sample of the second wave of our current research. The same procedure was repeated in December 2021 (wave 3 of our data collection) and June 2022 (wave 4 of our data collection). Waves 3 and 4 consisted of 480 and 485 respondents, respectively.

Exactly 3 years after the initial data collection (i.e., 25 March 2023 until 31 March 2023), the respondents from the 'pool' (n=3,444) were invited by Ghent University a final time for a follow-up study. Respondents who could telework a minimum of 10% and who passed the same practical conditions composed the final wave of our data collection (n=990).[2]

Our dataset contained 2,697 unique respondents. Many respondents participated in two or more waves; therefore, the total number of observations was 5,128. More specifically, 1,397 respondents participated in at least two waves. Of these 1,397 respondents participating in at least two waves, 90.9% experienced a telework intensity change, which is vital to identify effects in our analyses.

The average age of the 1,397 respondents was 42 years old; 52.1% of the respondents were female; 80.6% of this sample was highly educated; and 2.9% had a migration

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[2] Our data were collected partly during and partly after the COVID-19 pandemic. The COVID-19 restrictions varied across the different waves. Wave 1 was characterised by a period of total lockdown measures. In wave 2, there were still many restrictions, yet they were less severe compared to wave 1 due to the vaccination rollout that started in January 2021. Wave 3 fell in a period when some restrictions were reintroduced due to the omicron variant of the COVID-19 virus, while the lift of most restrictions characterised wave 4. In wave 5, no significant COVID-19 restrictions were in place in Belgium any longer. This heterogeneity in measures did not pose a substantial concern because the focus of this study was not on the evolution of the evaluation of telework but on employing the longitudinal character of the dataset to investigate associations between telework intensity and dimensions of workplace experience. In addition, we incorporated time dummies to account for time-specific effects including the common, unobserved, specific work and living conditions induced by the COVID-19 pandemic, although this measure did not fully account for the full impact of the pandemic, as explained in Section 5.

background.[3] This distribution aligns with the post-stratified 'full study sample with potential to telework' of Moens et al. (2022), except for education level.[4] That is, the respondents in our sample possessed a higher average education level than those in Moens et al. (2022). This was unsurprising because at the time of the data collection of Moens et al. (2022), which occurred in a period with total lockdown COVID-19 measures, jobs that required a lower education level could telework. However, according to Bloom et al. (2024), most employees who have continued regular teleworking after this period are university graduates in creative team jobs. Therefore, our current sample should be more representative of teleworking employees in Flanders than the sample of Moens et al. (2022).

Throughout all waves, we collected information on the following variables. First, we asked for the current percentage of working time performed via telework. Second, we asked respondents about their gender, age, highest education level and migration background.[5] We employed these questions to test the sample's representativeness (see above). However, these variables are not included in our analyses since we consider them time-invariant, and variance in these variables is therefore captured by the fixed effects. Third, the eight work-related perceptions, mentioned in Section 1 and depicted here in Figure 2, were measured using a scale ranging from 1 (certainly negative) to 5 (certainly positive).[6] These perceptions frequently occur in the literature on the consequences of telework (Moens et al., 2022). As in Gajendran et al. (2024), we utilised questions exploring attitudinal, behavioural, well-being and relational dimensions. In addition to this, we also investigated a growth dimension, as this was also included as a distal outcome in Gajendran

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[3] As explained below, besides the dependent and independent variables, we also had information on these socio-demographic variables.

[4] Moens et al. (2022) performed two steps to obtain this sample. First, a post-stratification strategy was applied in order to have a representative sample by (i) gender, (ii) age and (iii) education level for the population of Flemish employees under the age of 65 years. Second, from this basic sample, respondents whose jobs did not allow for telework were excluded. On average, respondents in this sample were 41 years old; 51.0% of the respondents were female; 57.3% of the sample was highly educated; 2.6% of these respondents had a migration background. The sample of the current study is in line with this study of Moens et al. (2022) regarding age, gender and migration background, but not regarding education level.

[5] The education levels were: i) no or primary education, ii) lower secondary education (minimum 3 years), iii) higher secondary education (minimum 6 years), iv) short-cycle higher education (2–3 years) (bachelor's degree), v) long-cycle higher education or university (master's degree or doctorate). In addition, migration background was assessed using a binary (yes/no) question.

[6] The specific question we posed was: 'The following statements are about your general view of teleworking (and therefore not specifically about the increased teleworking you may currently be experiencing). Do you think that telework in general has (or would have) a positive, negative or neutral effect on the following characteristics of your working life?'

and Harrison's (2007) initial model employed in Moens et al. (2022).[7]

<center><Figure 2 about here></center>

3. Analysis

We first performed a fixed effects ordinary least squares (OLS) analysis. Our general specification was given by Equation 1, with Y_{it} one of the eight employee perceptions discussed in Section 2 of individual i at time t as the outcome variable; α the intercept; μ_i the individual fixed effect; Δ the coefficient vector capturing the time effect D_t (i.e., four time dummies), t_{it} telework intensity (percentage of working time teleworking) of individual i at time t, β the regressions coefficients for t_{it} and ε_{it} the idiosyncratic time-variant error term. We were mainly interested in β, which expresses how many units a perception measure (e.g., 'job satisfaction') increases if telework increases by one percentage point.

$$Y_{it} = \alpha + \mu_i + D_t\Delta + \beta t_{it} + \varepsilon_{it}. \tag{1}$$

Through this fixed effects OLS approach, we could rule out individual time-invariant confounders, as discussed in Section 1. We opted for this type of analysis because random effects estimates could be biased and inconsistent. First, when performing random effects analysis, independence between the random effects and the independent variables is assumed (Townsend et al., 2013). This assumption implied that telework intensity should not be correlated with unobserved factors captured by the random effects, which cannot be guaranteed. For example, unobserved individual traits may correlate with telework intensity (Xanthopoulou et al., 2023). Second, this approach aligned with studies investigating the use—but not the intensity—of telework (Song & Gao, 2020). Third, Hausman tests confirmed that fixed effects analyses were more appropriate for most of the outcome variables, that is, 'job satisfaction' ($\chi^2 = 52.99$, $p < .001$), 'professional development' ($\chi^2 = 13.49$, $p = .019$), 'task efficiency' ($\chi^2 = 42.35$, $p < .001$), 'work-life balance' ($\chi^2 = 15.14$, p

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[7] In Moens et al. (2022), the items 'minimising my work-related stress' and 'minimising my chances of burnout' were also included. However, due to changes in the wording of these items across waves, they could not be retained in the longitudinal dataset.

<center>7</center>

= .010) and 'work concentration' (χ^2 = 49.53, p < .001).[8]

In addition to the above specification, we tested alternative fixed effects OLS specifications. In the first alternative specification, we added a quadratic term of t_{it} to the analyses (see Equation 2). In the second alternative specification, we employed dummies $T_{it}\Theta$ for categorical increments of t_{it} (see Equation 3). The reference category here was 'not teleworking'. We compared this reference category with i) 'sporadically teleworking' (less than 20% of the working time), ii) 'regular low-intensity teleworking' (a telework intensity between 20 to 50%) and iii) 'regular high-intensity teleworking' (teleworking more than 50% of the working time). Indeed, a telework intensity of 20% corresponds to a full day of telework every week for a full-time employee and, in the existing literature, a telework intensity of 50% is often seen as the distinction between high- and low-intensity teleworking (Gajendran & Harrison, 2007). Our 5,128 observations were distributed as follows: 26.7% 'not teleworking', 16.3% 'sporadically teleworking', 28.7% 'regular low-intensity teleworking' and 28.3% 'regular high-intensity teleworking' at the time of measurement.

$$Y_{it} = \alpha + \mu_i + D_t\Delta + \beta_1 t_{it} + \beta_2 (t_{it})^2 + \varepsilon_{it}. \tag{2}$$

$$Y_{it} = \alpha + \mu_i + D_t\Delta + T_{it}\Theta + \varepsilon_{it}. \tag{3}$$

4. Results

As discussed in Section 3, we use fixed effects OLS analyses to examine linear and non-linear associations between telework intensity and various dimensions of workplace experience. Table 1 presents the results of the fixed effects OLS analyses with a linear term for telework intensity. Table 2 displays results from fixed effects OLS analyses with linear and quadratic terms for telework intensity. Figure 3 visualises the marginal effects of these analyses. The results of the fixed effects OLS analyses with dummies for telework intensity

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[8] Only for 'promotion chances' (χ^2 = 5.70, p = .337), 'employer connectedness' (χ^2 = 9.90, p = .078) and 'relationship with colleagues' (χ^2 = 2.26, p = .812) did Hausman tests indicate that random effects analyses could also be consistent and be more efficient. We chose for the safer option, that is, fixed effects, because of the first two mentioned reasons.

can be found in Table A1 in Appendix A.[9] Figure B1 in Appendix B depicts the mean predictions (i.e., marginal effects) of these analyses. Based on these analyses, we categorise the associations into three groups: non-linear associations, linear associations and no associations.

<Table 1 about here>

<Table 2 about here>

<Figure 3 about here>

4.1 Non-linear associations

In this subsection we discuss the non-linear associations that were discovered. These non-linear associations are further subdivided into inverted U-shaped relationships and concave relationships with a plateau. Each category is explored in the subsections below. At the end of each subsection, we compare, where possible, our findings with the key studies mentioned in Section 1 (Gajendran et al., 2024; Rudolph and Zacher, 2024; and Reboul et al., 2023), and we provide possible explanations for these non-linear associations.

4.1.1 Inverted U-shaped associations

Regarding the attitudinal perception of 'job satisfaction', we find no significant coefficient for telework intensity in the specification with a linear term for telework intensity. However, the analysis incorporating also a quadratic term for telework intensity reveals a non-linear association with 'job satisfaction' ($\beta_1 = .010$, $p < .001$; $\beta_2 = -.00010$, $p < .001$). In Figure 3, we clearly observe an inverted U-shaped association for 'job satisfaction', with a peak at 50% teleworking. Specifically, at a telework intensity of 50%, job satisfaction reaches a maximum of 71.9% (i.e., 3.60 on a scale of 1 to 5).[10] The analysis with telework intensity dummies confirms this inverted U-shaped pattern. Regular low-intensity teleworking (20–50% of working time) yields the highest coefficient for 'job satisfaction' ($\theta_{RLIT} = 0.272$, $p < .001$)

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[9] The results of the fixed effects OLS analyses with dummies for telework intensity are included in an appendix, as they align with the findings from the fixed effects OLS analyses using linear and quadratic terms for telework intensity. However, we discuss these results in the main manuscript to provide further justification for our categorisation of perceptions into non-linear, linear and no associations with telework intensity.

[10] We interpret the 1–5 scale as a continuous variable with a multiplicator of 20 to facilitate interpretation.

relative to not teleworking. For regular high-intensity teleworking (over 50% of working time), 'job satisfaction' is lower than regular low-intensity teleworking ($\Delta_{RLIT-RHIT}$ = 0.110, p = .026, t-test results).[11]

Concerning the well-being perception of 'work-life balance', we also find no evidence for a linear association but observe instead a non-linear, inverted U-shaped association with telework intensity. Indeed, the analysis with a quadratic term for telework intensity reveals a non-linear association (β_1 = .012, p < .001; β_2 = −.00010, p < .001). Figure 3 illustrates an inverted U-shaped association, with a peak at 56%, indicating that at a telework intensity of 56%, 'work-life balance' reaches a maximum of 75.1% (i.e., 3.76 on a scale of 1 to 5). This inverted U-shaped association is confirmed in fixed effects analyses with telework intensity dummies. Compared to not teleworking, sporadic teleworking (less than 20% of working time) already improves 'work-life balance' (θ_{ST} = .149, p = .033), while teleworking between 20% and 50% is even more beneficial in terms of 'work-life balance' (θ_{RLIT} = .392, p < .001). For regular high-intensity teleworking, the coefficient is lower than for regular low-intensity teleworking ($\Delta_{RLIT-RHIT}$ = 0.107, p = .057, t-test results), confirming the inverted U-shape.[12]

The association between telework intensity and the relational perception 'relationship with colleagues' is suggestively inverted U-shaped. We find no evidence of a linear association, but based on the analysis with a quadratic term for telework intensity, indications of an inverted U-shaped association exist.[13] The marginal effects plot in Figure 3 shows an inverted U-shaped pattern, with a peak at 54% teleworking (β_1 = .005, p = .017; β_2 = −.00004, p =.020).

The association between telework intensity and the professional growth perception of 'professional development' is also suggestively inverted U-shaped. Table 1 indicates that this association is not linear. While the fixed effects analysis with a quadratic term for telework intensity does not provide sufficient evidence to conclude an inverted U-shaped association (β_1 = .003, p = .159; β_2 = −.00003, p = .085), the fixed effects analysis with telework intensity

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[11] It is interesting to note that the coefficient of regular high-intensity teleworking is still significantly higher compared to not teleworking (θ_{RHIT} = 0.162, p = .025).

[12] Here as well, the coefficient of regular high-intensity teleworking is significantly higher than that of not teleworking (θ_{RHIT} = 0.285, p = .001).

[13] This is not confirmed by the analysis with telework intensity dummies, as it does not convincingly point in the direction of an inverted U-shaped association: the coefficient of regular high-intensity teleworking does not significantly differ from that of regular low-intensity teleworking (ΔRLIT-RHIT = 0.048, p = .287, t-test results).

dummies do suggest this. The highest positive coefficient is observed for regular low-intensity teleworking (θ_{RLIT} = .123, p = .017) relative to not teleworking. For regular high-intensity teleworking, the coefficient is lower than for regular low-intensity teleworking ($\Delta_{RLIT-RHIT}$ = 0.083, p = .058, t-test results), which aligns with the characteristics of an inverted U-shaped association.

Next, we compare our findings with key studies mentioned in Section 1. First, we compare the results for 'job satisfaction'. This is the only fully comparable perception with Rudolph and Zacher (2024). Our findings align with theirs as they found that the within-person percentage of time working from home had an inverted U-shaped association with job satisfaction. Gajendran et al. (2024) report a small positive association between telework intensity and 'job satisfaction'. However, by not accounting for a potential inverted U-shaped association, their study overlooks how the effect of telework intensity on 'job satisfaction' varies at different levels, leading to an underestimation of the impact at moderate levels of telework intensity. Second, regarding the well-being perception of 'work-life balance', we find no significant coefficient in the specification with a linear term for telework intensity, which is consistent with Gajendran et al. (2024), who also report null effects on 'work interference with family' and 'family interference with work'.[14] By also examining non-linear associations, we find that the association between telework intensity and 'work-life balance' is inverted U-shaped, rather than linear. While Reboul et al. (2023) also report a non-linear association, their findings differ in the nature of the non-linearity, showing that employees in their study experienced improved reconciliation of work and personal life with each additional teleworking day, up to a ceiling of 4 days. Third, concerning the association between telework intensity and 'relationships with colleagues', neither Gajendran et al. (2024) nor this study finds a linear association. Again, further investigation in our study suggests an inverted U-shaped association. Fourth, comparing the perceptions in the growth dimension is impossible, as Gajendran et al. (2024) no longer include these

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[14] According to Fisher et al. (2009), 'work-life balance' is broader than the two aspects of work-family conflict. Next to 'work interference with personal life' and 'personal life interference with work', 'work life-balance' also consists of 'personal life enhancement of work' (i.e., the degree to which private life improves an individual's accomplishment at work) and 'work enhancement of personal life' (i.e., the degree to which work can improve the quality of an individual's private life) (Fisher et al., 2009).

outcomes in their framework.[15]

To conclude this subsection, we discuss why hybrid work schedules could be preferred over an office-only or telework-only regime in relation to the perceptions above. For 'work-life balance', teleworking may initially lead to improvements by reducing commuting time and offering greater flexibility; however, excessive teleworking can blur the boundaries between work and personal life, potentially resulting in stress and a diminished sense of balance (Lazauskaite-Zabielske et al., 2022). Regarding 'relationships with colleagues', our findings suggest that a moderate reduction in contact can be beneficial, whereas excessively limited offline contact may have detrimental effects. Gajendran and Harrison (2007) highlighted the risks of high-intensity telecommuting, which include reduced opportunities for spontaneous, rich, face-to-face interactions and relies on leaner communication media, also leading to a diminished sense of social presence. This reduced presence can also negatively impact 'professional development', as lower visibility may reinforce possibly false perceptions that employees prioritise personal life over professional responsibilities, leading to fewer developmental opportunities (Gajendran and Harrison, 2007; Moens et al., 2023). Additionally, excessive teleworking may limit informal learning opportunities, such as networking, mentoring and teamwork, which are more readily available in an office environment (Gajendran and Harrison, 2007). Conversely, at moderate levels of teleworking intensity, these risks may not materialise, and teleworking can even lead to increased developmental opportunities by, for example, enabling improved performance (Gajendran et al., 2024; Labrado Antolín et al., 2022).

4.1.2 Concave associations with a plateau

The association between telework intensity and the behavioural perception 'task efficiency' can be characterised as concave with a plateau. Although we find a significantly positive coefficient (β = .002, p = .028) for telework intensity in the specification with a linear term for telework intensity, the marginal effects plot in Figure 3 shows a non-linear pattern. More specifically, we observe a concave association at lower levels of telework intensity and a

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[15] In the original framework of Gajendran and Harrison (2007), 'perceived career prospects' is included in their framework for the consequences of telework, which prompted us to include 'promotion chances' and 'professional development' in our investigated perceptions as well.

plateau at higher levels of telework intensity. The fixed effects analysis with dummies for telework intensity confirms this plateauing as the coefficient of regular high-intensity teleworking and that of regular low-intensity teleworking do not significantly differ ($\Delta_{RLIT-RHIT}$ = −0.009, p = .865, t-test results).

Similarly, the association between telework intensity and the behavioural perception 'work concentration' can be classified as concave with a plateau. The marginal effects plot in Figure 3 visualises this non-linear pattern, and in the analysis with telework intensity dummies, the coefficient of regular high-intensity teleworking does not significantly differ from that of regular low-intensity teleworking ($\Delta_{RLIT-RHIT}$ = −0.011, p = .825, t-test results).

The later peak in 'task efficiency' and 'work concentration' at a telework intensity of 70% (compared to the approximately 50% peak for other perceptions) and the absence of a subsequent decline can be explained by the fact that increased teleworking implies enhanced opportunity to maintain a deep, uninterrupted work state, thereby allowing employees to work with greater concentration and efficiency enabling peak productivity times (Gajendran & Harrison, 2007). When working from home, employees encounter fewer unplanned interruptions, such as spontaneous communications from colleagues, and can better manage disruptions to their work (Biron & van Veldhoven, 2016; Gajendran & Harrison, 2007; Golden & Veiga, 2005). After each distraction, employees must re-enter a state of immersion, a process that can take up to 15 minutes to regain full concentration. The frequent interruptions that are more likely to occur on employers' premises, therefore, hinder the ability to achieve a peak state of performance (Biron & van Veldhoven, 2016).

4.2 Linear associations

We classify the association between telework intensity and 'employer connectedness' as linearly negative.[16] Table 1 reveals a small yet significant negative coefficient for the attitudinal perception of 'employer connectedness' (β = −.002, *p* = .034). This implies that an increase in telework intensity by 20 percentage points (which equals one more day of teleworking for a full-time employee) is associated with a decrease of 0.03 points on the 1-to-5 scale of 'employer connectedness'. In economic terms, this represents a small

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[16] Neither the analysis with a quadratic term for telework intensity (β_1 = .000, p = .809; β_2 = −.00002, *p* = .276) nor the analysis with telework intensity dummies provides evidence supporting a non-linear association.

association.

While we identify a small negative coefficient for 'employer connectedness' in the linear association, Gajendran et al. (2024) report a small positive association between telework intensity and 'organisational commitment'. This discrepancy might be due to the focus on affective commitment in our study. At the same time, 'organisational commitment' in the study of Gajendran et al. (2024) is broader as it also encompasses normative and continuance commitment.[17] While high-intensity teleworking may diminish the emotional attachment and desire to remain in the organisation (affective commitment), it may simultaneously increase the perceived costs of leaving (continuance commitment) and foster a sense of obligation to stay, as teleworking opportunities may be viewed as a favour to be reciprocated (normative commitment) (Meyer & Allen, 1991; Moens et al., 2024b).

4.3 No association

Our findings indicate no significant association between telework intensity and the professional growth perception 'promotion chances'. First, we observe no significant coefficient for telework intensity in Table 1 ($\beta = -.000$, $p = .532$). Second, neither the fixed effects analysis incorporating a quadratic term for telework intensity ($\beta_1 = .001$, p = .679; $\beta_2 \in (-.00001, 0)$, $p = .491$) nor the fixed effects analysis using telework intensity dummies suggests a non-linear association.

5. Conclusion

Today, many employees prefer to continue teleworking in the aftermath of the COVID-19 pandemic, whereas numerous organisations advocate for a return to the office. Hybrid working arrangements (i.e., combining telework with on-site work) have been proposed as

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[17] Meyer and Allen (1991) distinguish three components of commitment: i) affective commitment reflects a desire to maintain membership in the organisation that develops largely as the result of work experiences that create feelings of comfort and personal competence, ii) continuance commitment reflects a need to remain resulting from recognition of the costs associated with leaving and iii) normative commitment reflects an obligation to remain resulting from internalisation of a loyalty norm and the receipt of favours that require repayment.

a potential compromise to bridge the divide between employers' and employees' preferences. However, sound scientific research on the optimal level of telework intensity for self-rated workplace experiences has remained limited.

Using a five-wave longitudinal dataset, this study examined linear and non-linear associations between telework intensity and self-rated employee attitudes, behaviours, well-being, social relationships and professional growth. In doing so, we investigated a concise set of perceptions of workplace experience potentially impacted by telework intensity. This approach also represented: i) a significant step towards causal interpretation compared to the predominance of cross-sectional studies in the existing literature and ii) an exploration of the non-linearity of these associations, which, while frequently proposed, had rarely been empirically tested. These improvements were essential to clarifying earlier mixed findings and addressing the possibility that some studies, due to their neglect of non-linearity, failed to identify significant associations and underestimated the impact of telework on several dimensions of workplace experience at certain levels of telework intensity.

Our fixed effects OLS analyses suggested: i) inverted U-shaped associations with 'job satisfaction', 'work-life balance', 'relationships with colleagues' and 'professional development', all peaking at approximately 50% teleworking; ii) concave associations with a plateau for 'task efficiency' and 'work concentration', which begin plateauing at around 70% teleworking; iii) a modest negative linear association with 'employer connectedness' and iv) no discernible association with 'promotion chances'.

Although our analyses relied on a longitudinal design, which was called for by many researchers in the field, they were not without limitations. First, as fixed effects analyses only rule out unobserved time-invariant confounders, our analyses were still at risk of omitted variable bias caused by non-included time-variant variables. Therefore, we recommend follow-up research that uses experimental designs ruling out the influence of missed confounders to claim true causality. Steps in this direction were first taken by Bloom et al. (2024), who used a randomised control trial to examine the causal effect of a hybrid schedule in which employees are allowed to telework 2 days per week on, for example, job satisfaction. Future research should, however, examine more variations in telework intensity. Second, a balanced longitudinal dataset is preferred over an unbalanced

longitudinal dataset to minimise attrition bias. In our study, we lost several participants in the second wave compared to the first wave. This attrition entailed that missing observations were endogenous. However, comparisons of the observable characteristics across the waves indicated that gender, age and education level were at least comparable between the subsamples. Third, our data were collected partly during and partly after the COVID-19 pandemic. While using time dummies helped control for time-specific effects that were common across all individuals in the dataset at a particular time, they may not have fully accounted for the specific and heterogeneous impacts of the pandemic across different job contexts and individual circumstances. Despite these limitations, the scientific contribution of our study, as outlined above, remains substantial.

Furthermore, our study held significant societal relevance. It provided more robust evidence for employers and policymakers that the majority of self-reported dimensions of workplace experience are higher when on-site work is combined with telework, that is, when the working schedule is hybrid. Teleworking for approximately half of the working time resulted in the highest levels of 'job satisfaction', 'work-life balance', 'professional development' and 'relationships with colleagues', probably due to benefits such as reduced commuting time and increased flexibility. However, when telework starkly exceeded this proportion, the evaluation of these perceptions declined as negative factors such as blurred boundaries, reduced physical presence and limited informal learning may have started to dominate. Conversely, 'task efficiency' and 'work concentration' were higher at these higher levels of telework intensity, probably owing to improved management of unplanned interruptions. At such levels, a trade-off between performance and factors like 'relationships with colleagues' and 'employer connectedness' should be considered. Based on these results, one might also question whether it would not be more beneficial to allow greater flexibility in telework arrangements tailored to the tasks at hand rather than maintaining a fixed weekly schedule. For instance, during weeks requiring more focused work, employees could be encouraged to work from home more frequently, while teleworking could be reduced in weeks when this is less necessary. A final practical implication of these findings concerns employees' control over their telework intensity. Encouraging employee participation in decisions about the extent of teleworking is desirable for optimising telework arrangements and could also be a valuable strategy in the ongoing 'war for talent'. Employers should not hesitate to engage in such dialogue, even with employees seeking

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high levels of telework, as even with regular high-intensity telework, predominantly positive associations remained between telework intensity and the investigated employee perceptions.

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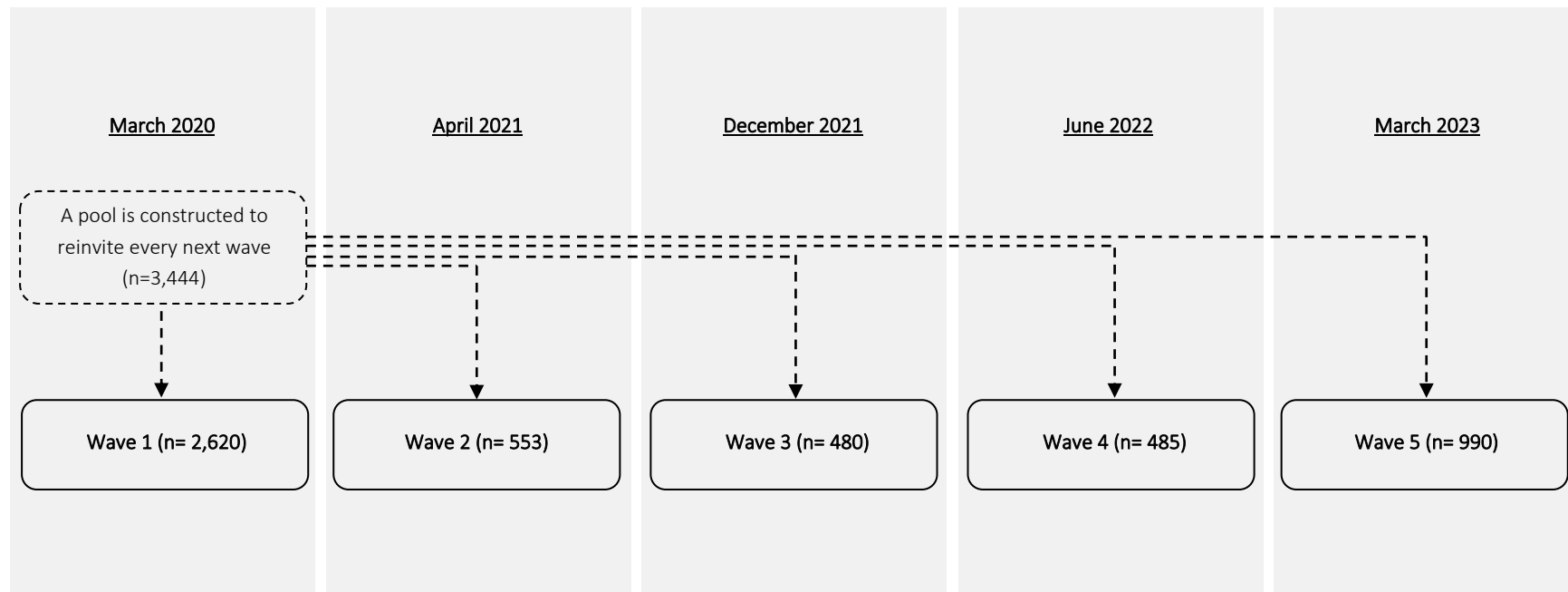
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Figures and tables

Figure 1. Data collection

Notes. The practical conditions that need to be met for inclusion in a wave were agreeing with the informed consent question, passing the attention check and not being older than 65, the retirement age of the economically active population in Belgium at the time.

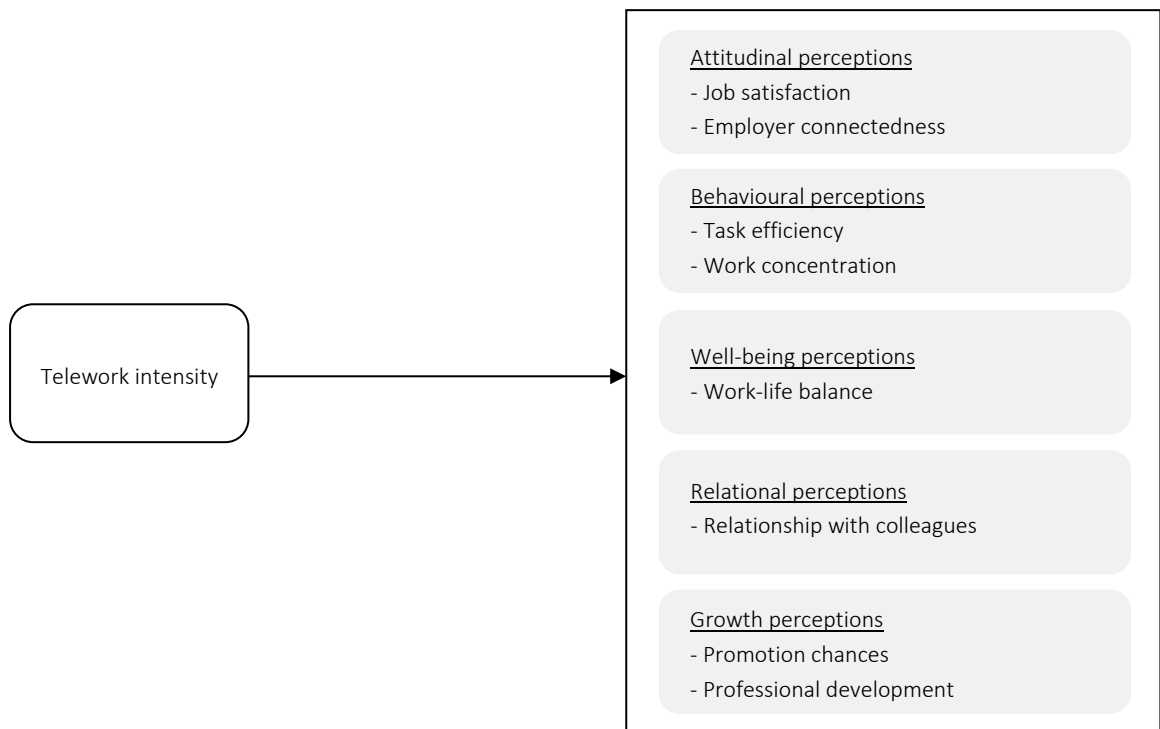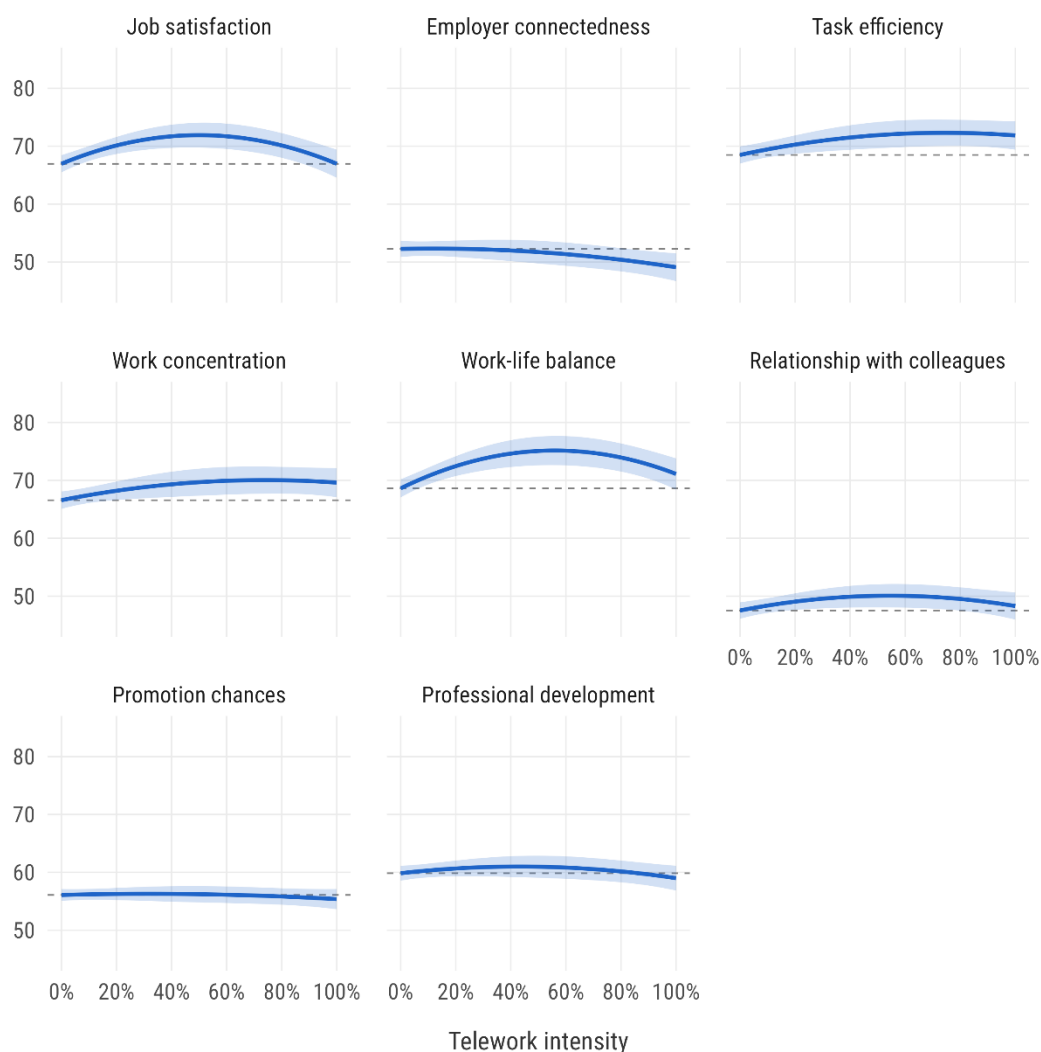**Figure 2.** The investigated perceptions

Figure 3. Marginal effects of the regressions with linear and quadratic terms for telework intensity

Notes. Solid lines represent mean predictions (i.e., marginal effects) for each employee perception based on fixed effects OLS specifications (see Equation 2 and Table 2). Predictions are calculated across a balanced grid of time dummies with standard errors clustered at the respondent level. Ribbons indicate 95% confidence intervals. Dashed horizontal lines depict baseline perception values at 0% telework intensity. Perceptions are originally measured on a 1–5 scale and rescaled using a multiplicator of 20 to facilitate interpretation.

Table 1. Fixed effects OLS with a linear term for telework intensity

	Satisfaction	Connectedness	Efficiency	Concentration	Work-life balance	Colleague relationship	Promotion	Development
Telework intensity	0.000 (0.001)	−0.002* (0.001)	0.002* (0.001)	0.002† (0.001)	0.001 (0.001)	0.000 (0.001)	−0.000 (0.001)	−0.000 (0.001)
Time fixed effects								
Time dummy – wave 1 (reference category)								
Time dummy – wave 2	−0.565*** (0.067)	−0.081 (0.062)	−0.214** (0.068)	−0.251*** (0.069)	−0.635*** (0.076)	−0.165** (0.061)	−0.019 (0.047)	−0.033 (0.059)
Time dummy – wave 3	−0.423*** (0.063)	0.041 (0.059)	−0.101 (0.064)	−0.060 (0.065)	−0.312*** (0.072)	0.050 (0.057)	0.033 (0.044)	0.073 (0.055)
Time dummy – wave 4	−0.327*** (0.052)	0.040 (0.049)	0.109* (0.053)	0.132* (0.054)	0.032 (0.060)	0.093† (0.048)	0.068† (0.036)	0.148** (0.046)
Time dummy – wave 5	0.046 (0.040)	−0.084* (0.037)	0.259*** (0.040)	0.193*** (0.041)	0.223*** (0.045)	0.039 (0.036)	0.077** (0.028)	0.046 (0.035)
Individual fixed effects included	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2 within	0.086	0.012	0.038	0.029	0.081	0.011	0.006	0.007
N	5,128	5,128	5,128	5,128	5,128	5,128	5,128	5,128

Notes. The presented statistics are coefficient estimates with clustered standard errors at the respondent level between parentheses. Intercepts are omitted. *** (**) ((*)) (((†))) indicates statistical significance at the 0.1% (1%) ((5%)) (((10%))) significance level.

Table 2. Fixed effects OLS with linear and quadratic terms for telework intensity

	Satisfaction	Connectedness	Efficiency	Concentration	Work-life balance	Colleague relationship	Promotion	Development
Telework intensity	0.010*** (0.002)	0.000 (0.002)	0.005* (0.002)	0.005* (0.002)	0.012*** (0.002)	0.005* (0.002)	0.001 (0.001)	0.003 (0.002)
Telework intensity^2	−0.0000989*** (0.0000203)	−0.0000207 (0.0000189)	−0.0000346† (0.0000206)	−0.0000318 (0.0000209)	−0.0001043*** (0.0000231)	−0.0000431* (0.0000186)	−0.0000098 (0.0000142)	−0.0000309† (0.0000179)
Time dummies included	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual fixed effects included	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2 within	0.095	0.013	0.039	0.03	0.088	0.013	0.006	0.008
N	5,128	5,128	5,128	5,128	5,128	5,128	5,128	5,128

Notes. The presented statistics are coefficient estimates with clustered standard errors at the respondent level between parentheses. Intercepts are omitted. *** (**) ((*)) (((†))) indicates statistical significance at the 0.1% (1%) ((5%)) (((10%))) significance level.
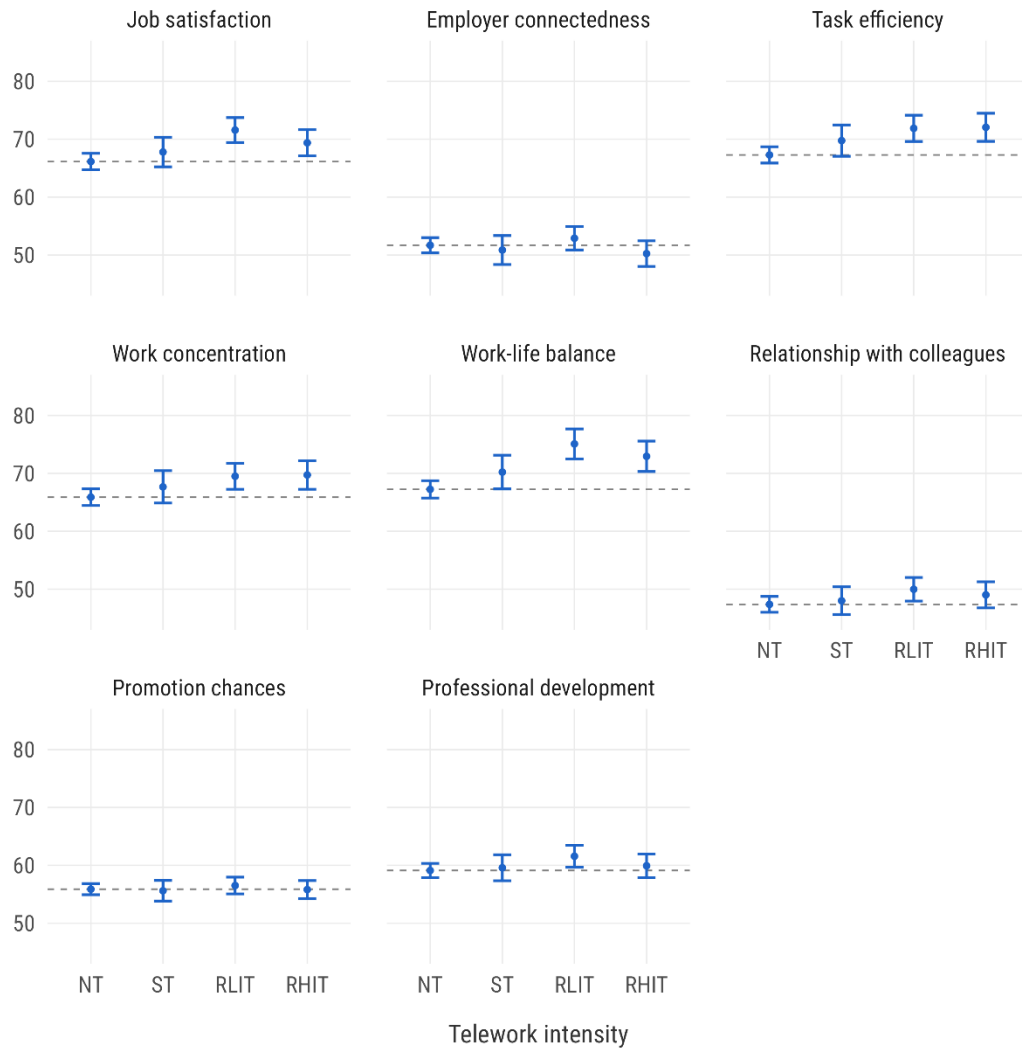
Appendix A: Additional tables

Table A1. Fixed effects OLS with dummies for telework intensity

	Satisfaction	Connectedness	Efficiency	Concentration	Work-life balance	Colleague relationship	Promotion	Development
Telework intensity								
Not teleworking (reference category)								
Sporadically teleworking	0.083 (0.062)	−0.041 (0.057)	0.123* (0.062)	0.090 (0.063)	0.149* (0.070)	0.032 (0.056)	−0.014 (0.043)	0.024 (0.054)
Regular low-intensity teleworking	0.272*** (0.059)	0.061 (0.055)	0.230*** (0.059)	0.181** (0.060)	0.392*** (0.067)	0.130* (0.054)	0.031 (0.041)	0.123* (0.052)
Regular high-intensity teleworking	0.162* (0.072)	−0.072 (0.067)	0.238** (0.073)	0.192* (0.075)	0.285** (0.082)	0.082 (0.066)	−0.004 (0.051)	0.040 (0.064)
Time dummies included	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual fixed effects included	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2 within	0.096	0.015	0.042	0.032	0.094	0.014	0.007	0.011
N	5,128	5,128	5,128	5,128	5,128	5,128	5,128	5,128

Notes. The presented statistics are coefficient estimates with clustered standard errors at the respondent level between parentheses. Intercepts are omitted. *** (**) ((*)) (((†))) indicates statistical significance at the 0.1% (1%) ((5%)) (((10%))) significance level.

Appendix B: Additional figures

Figure B1. Marginal effects of the regressions with telework intensity dummies

Notes. Acronyms: NT (not teleworking, i.e., 0% teleworking), ST (sporadically teleworking, i.e., teleworking less than 20%), RLIT (regular low-intensity teleworking, i.e., teleworking between 20% and 50%), RHIT (regular high-intensity teleworking, i.e., teleworking more than 50%). Points represent mean predictions (i.e., marginal effects) for each employee perception based on fixed effects OLS specifications (see Equation 3 and Table A1 in Appendix A). Predictions are calculated across a balanced grid of time dummies with standard errors clustered at the respondent level. Error bars indicate 95% confidence intervals. Dashed horizontal lines depict baseline perception values for 'not teleworking'. Perceptions are originally measured on a 1–5 scale and rescaled using a multiplicator of 20 to facilitate interpretation.