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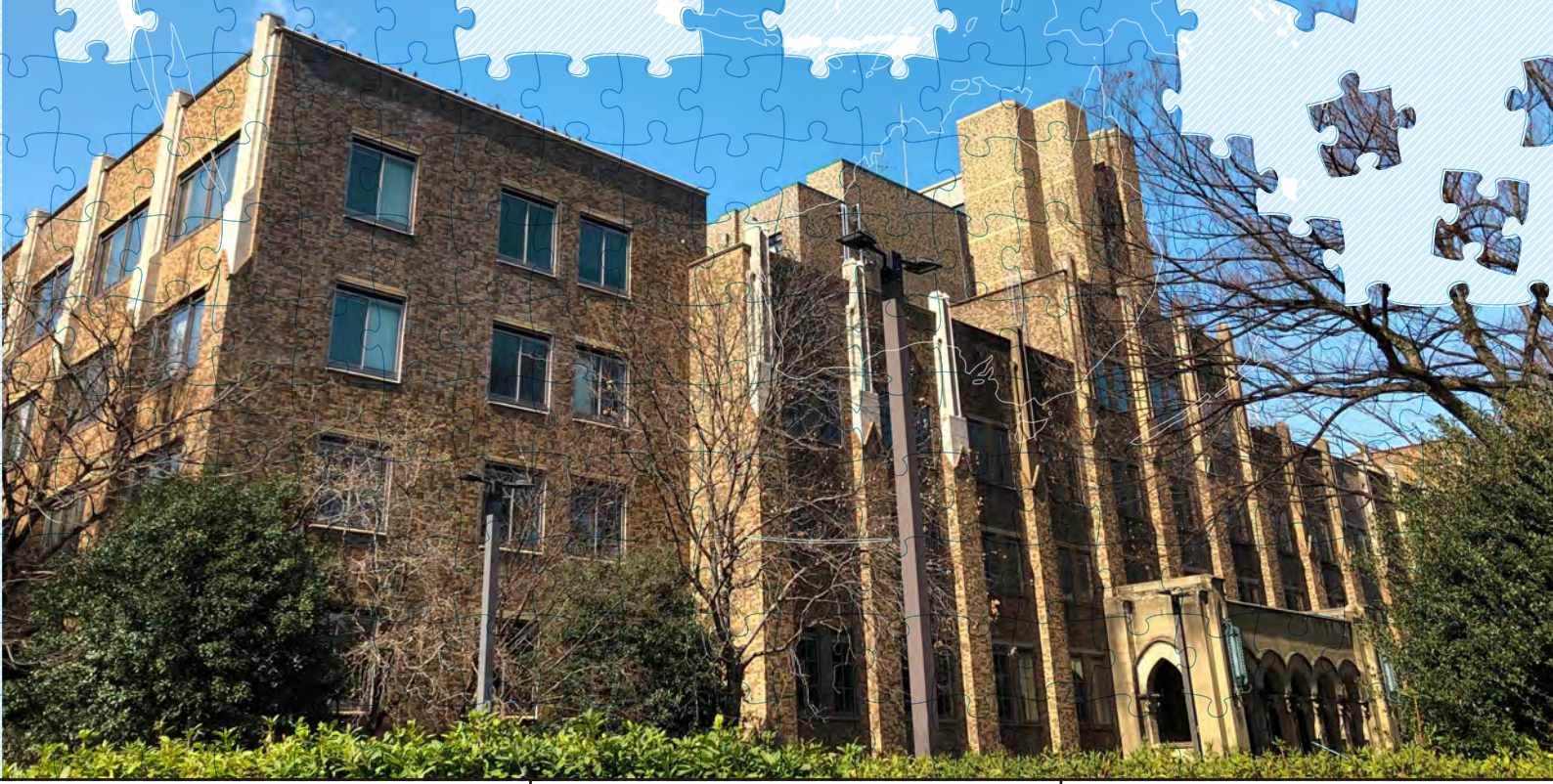
Workplace inclusion and its association with psychological distress and work engagement among Japanese employees: The moderating role of work arrangement in a prospective study



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Workplace inclusion and its association with psychological distress and work engagement among Japanese employees: The moderating role of work arrangement in a prospective study

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Workplace inclusion has been increasingly recognized as a key determinant of employee well-being and motivation. However, its long-term impact has been scarcely examined, particularly in relation to the role of work arrangements in shaping this relationship. This study aimed to investigate the prospective associations between workplace inclusion and two key outcomes, psychological distress and work engagement, while examining the moderating effects of work arrangements (i.e., office work, infrequent telework, and frequent telework) on these associations among Japanese employees. A web-based longitudinal survey was conducted in February and November 2024. We analyzed 3898 responses using linear regression, stratified by gender and adjusted for relevant covariates. The results showed that higher workplace inclusion was significantly associated with lower psychological distress and greater work engagement for both men and women. Notably, work arrangement moderated the association between inclusion and work engagement among women. The positive effect of inclusion was significant only for those working in the office, while it was not significant for frequent teleworkers. No significant moderation effects were observed for men in relation to either psychological distress or work engagement. These findings suggest that workplace inclusion serves as a protective and motivational factor over time. However, its effectiveness may depend on the nature of work arrangements. Tailored inclusion strategies are needed to ensure that all employees, particularly women who telework frequently, can fully benefit from inclusive work environments.

Introduction

Workplace inclusion has become a vital topic in organizational research and practice, particularly given the increasing diversity in the workforce, such as among women, older adults, immigrants, and people with disabilities (Shore et al., 2018). Although the recruitment and retention of a diverse workforce is considered essential for maintaining the competitiveness and sustainability of organizations, diversity does not guarantee favorable consequences for organizations and individuals (Jackson and Joshi, 2011; Holmes et al., 2021). Workplace inclusion has emerged as a diversity management strategy that emphasizes an organizational culture in which all employees are valued and treated as esteemed members of the workplace (Ferdman, 2014; Mor Barak, 2022).

A growing body of empirical research has demonstrated that inclusion is positively associated with health and work outcomes at various levels in the organization (Shore and Chung, 2024). At the organizational level, employees who perceive fair treatment and respect in their organization tend to experience better mental health and lower rates of sickness absence (Ndjaboué et al., 2012). An inclusive climate also helps fulfill diversity-related expectations, thereby increasing affective commitment among employees, particularly those with minoritized identities such as gender, race, or age (Li et al., 2019). At the interpersonal level, inclusive leadership, which involves leader behaviors that invite and appreciate employee contributions, has been shown to bolster employees' vigor, which in turn enhances their workplace well-being (Liu et al., 2024). Inclusive leadership has also been associated with knowledge sharing, such as knowledge donation and knowledge collection among Japanese employees (Morinaga et al., 2021). At the individual level, perceived inclusion was associated with both negative and positive health, while the association with negative health was stronger for racial-ethnic minority employees (Ehrhart and Chung, 2023).

Moreover, perceptions of inclusion significantly predicted greater work engagement, organizational commitment, and intent to stay (Duong et al., 2024).

Despite growing evidence supporting the benefits of inclusion, several research gaps remain. First, previous empirical studies have seldom considered the effects of workplace inclusion on multiple domains of employee well-being and motivation within a longitudinal framework. Most previous studies have relied on cross-sectional designs, limiting our ability to draw conclusions about the long-term impact of inclusion (Randel, 2025). Moreover, the relationships between inclusion and health or work outcomes are often examined in different study contexts, whereas few studies have examined both outcomes within the same study. Longitudinal research that integrates these domains is needed to provide a more comprehensive understanding of how inclusion shapes employee well-being and motivation.

Second, recent changes in the nature of work, particularly the shift toward remote or hybrid work arrangements, raise important questions about whether the benefits of inclusion vary by work context. Emerging evidence suggests that remote or virtual work may reduce opportunities for social interactions, potentially weakening the positive effects of inclusive leadership or climate on employee outcomes (Lauring and Jonasson, 2023). These insights underscore the need to examine how work arrangements may moderate the effects of workplace inclusion on health and work outcomes. The positive impact of inclusion on well-being and motivation may be more pronounced among employees working in office, where social interactions occur physically, than among those working remotely, who may be less likely to benefit from inclusive work environments.

To this end, the present study investigates the prospective associations between workplace inclusion and two key outcomes, namely, psychological distress and work

engagement, among Japanese employees. Furthermore, we examine whether the work arrangement (i.e., office work or telework) moderates these associations. Understanding the long-term impact of inclusion on employee well-being and motivation, depending on work arrangements, is particularly important in the context of post-pandemic work transitions, where inclusion must be fostered across both physical and virtual environments. These insights may also contribute to a more nuanced understanding of the mechanisms through which workplace inclusion affects employee well-being and motivation. We hypothesize that workplace inclusion is negatively associated with psychological distress and positively associated with work engagement, with these associations being stronger for office workers than for teleworkers.

It is also worth highlighting the Japanese context in which diversity and inclusion initiatives have been taking place. In Japan, the promotion of workplace inclusion has mainly occurred through increasing the labor force participation of women, aimed at counteracting the shrinking working population due to demographic changes such as aging and declining birthrates (Shinohara and Alcantara, 2023). The inclusion of a diverse workforce in terms of gender may be challenging because of prevailing masculinity and gender-role norms in the Japanese workplace, which expect men to be breadwinners fully committed to their work and women to be primary caregivers and housewives (Hofstede et al., 2010; McDaniel, 2015; Ruppanner, 2015). Thus, the mechanisms linking workplace inclusion to employee well-being and motivation may differ between Japanese male and female employees, which will also be examined in the present study.

Methods

Participants and procedure

We administered a web-based longitudinal survey to Cross Marketing Inc.'s online monitor. The survey targeted the working population between the ages of 20 and 64, either full-time or part-time. The baseline survey was administered in February 2024, and a follow-up survey was administered in November 2024. There were 10000 participants in the baseline survey and 4600 in the follow-up survey (retention rate of 46.0%). Inattentive responses were excluded on the basis of the combination of attention check items and item-level response speed. In particular, responses were excluded if the respondents made one or more errors out of 2 attention check items or if the overall item-level response time using the speed factor was in the range of the 5th percentile of all the responses (Maniaci and Rogge, 2014; Leiner, 2019). After those with at least one missing response for the variable used in the analysis were excluded, 3898 responses remained for prospective analyses. Figure 1 summarizes the participant selection procedure.

[Figure 1 near here]

Measures

Exposure

Workplace inclusion was measured using the Japanese version of the work group inclusion scale (Chung et al., 2020; Yokouchi et al., 2023). This scale comprises a five-item belongingness subscale that measures employees' perceptions that they are being accepted by and connected to work group members and a five-item uniqueness subscale that measures employees' perceptions that they can be different from their work group

members and that their differences are valued and respected. These items were evaluated on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The Cronbach's alpha coefficient was 0.95 for the sample of this study.

Work arrangement was assessed by asking the respondents how frequently they work remotely per usual week. If the respondents always work at the office, they are classified as office workers. If the respondents worked remotely for one or two days per week, they were categorized as infrequent teleworkers. If the respondents worked remotely for three days or more per week, they were categorized as frequent teleworkers.

Outcomes

For health outcomes, psychological distress was measured using the Japanese version of the Kessler Psychological Distress (K6) scale (Kessler et al., 2002; Furukawa et al., 2008). The K6 scale consists of six items that measure the frequency of respondents' recent experiences of psychological distress symptoms during the past 30 days. The items were measured on a five-point Likert scale ranging from 1 (none of the time) to 5 (all of the time). The Cronbach's alpha coefficients were 0.94 and 0.95 for the baseline and follow-up surveys, respectively.

For work outcomes, work engagement was measured using the shortened Japanese version of the Utrecht Work Engagement Scale (UWES-J) (Schaufeli et al., 2006; Shimazu et al. 2008). This scale uses nine items to measure how frequently employees feel energetic and effectively connected with work activities, specifically characterized by a sense of vigor, dedication, and absorption, each having three items constituting a single dimension. All the items were measured on a seven-point Likert scale ranging from 1 (never) to 7 (always). The Cronbach's alpha coefficients were 0.96 and 0.97 for the baseline and follow-up surveys, respectively.

Covariates

The demographic and occupational characteristics of the respondents were used as covariates from a theoretical perspective (Lee, 2014). Demographic characteristics included age group (20–29 years, 30–39 years, 40–49 years, 50–59 years, or 60–64 years) and educational attainment (high school graduate or below, vocational or junior college graduate, or college graduate or higher). Occupational characteristics included employment status (part-time or full-time), occupation (manual, nonmanual, professional, or others), positional rank (general employee, assistant manager, department head or higher, or others [equates to part-time]), company size (300 employees or less, 300–1000 employees, 1000–3000 employees, 3000–10000 employees, 10000 employees or more), and weekly work hours (34 hours or less, 35–39 hours, 40–44 hours, or 45 hours or more). Additionally, psychological distress and work engagement at baseline were included as covariates.

Statistical analysis

We conducted a linear regression analysis using three different models for psychological distress and work engagement, stratified by gender. First, the unstandardized regression coefficients for workplace inclusion were estimated without any adjustment for covariates (Model 1). Second, demographic characteristics (i.e., age and educational attainment), occupational characteristics (i.e., employment status, occupation, positional rank, company size, and weekly work hours), and either psychological distress or work engagement at baseline were added to the model for adjustment (Model 2). Finally, we added work arrangements to interact with workplace inclusion (Model 3). All the statistical analyses were conducted using Stata version 18.0 (StataCorp, College Station, TX, USA).

Attrition analysis

Independent-sample t tests and χ^2 tests were conducted to determine whether the baseline demographic characteristics and other key study variables for the 4600 respondents who participated in the follow-up survey and the 5400 respondents who dropped out of the follow-up survey were significantly different at $p < 0.01$. Among the demographic characteristics, the differences were significant for sex ($\chi^2(1) = 36.2$, $p = 0.00$, Cramer's $V = 0.06$) and age ($\chi^2(9998) = 17.8$, $p = 0.00$, Cohen's $d = 0.36$) but nonsignificant for educational attainment ($\chi^2(2) = 4.74$, $p = 0.09$, Cramer's $V = 0.02$). In particular, the proportion of women was greater among the drop outs (37.7%) than among those who continued to participate (31.9%), and vice versa for men. The average age was 41.2 years for those who dropped out, whereas it was 44.9 years for those who did not. Among the other key variables, the differences were significant for psychological distress ($t(9998) = -6.56$, $p = 0.00$, Cohen's $d = -0.13$) but nonsignificant for work engagement ($t(9998) = 1.78$, $p = 0.08$, Cohen's $d = 0.04$). In particular, psychological distress was greater (6.4) among those who dropped out than among those who stayed in the survey (5.6). The effect size ranged from small to medium (Cohen, 2016), even for those variables that differed significantly. Thus, we considered that the systematic effects due to attrition were unlikely to be prominent.

Ethics

The online survey was reviewed and approved by the Research Ethics Committee at the Institute of Social Science, The University of Tokyo (No. 136 and No. 155).

Results

The demographic and occupational characteristics of the study participants at baseline are shown in Table 1. The proportions of male and female workers were 68.4% and

31.6%, respectively. The mean age of the participants was 45.4 years (SD = 9.9), and most were college graduates or higher (66.2%). With respect to employment status, occupation, and positional ranks, full-time (91.5%), nonmanual (46.9%), and general employees (46.7%) constituted the largest proportion of the participants. With respect to work arrangements, office workers were most common (74.9%). For weekly work hours, 40–44 hours were the most common (37.5%).

[Table 1 near here]

Table 2 and Figure 2a present the prospective associations of workplace inclusion with subsequent psychological distress and the moderating effect of work arrangements. For the crude model without any adjustment for covariates (Model 1), workplace inclusion was significantly and negatively associated with psychological distress for men (β = −2.42, 95% CI = [−2.68, −2.17]) and women (β = −2.68, 95% CI = [−3.07, −2.29]). After adjusting for covariates (Model 2), the negative association between workplace inclusion and psychological distress attenuated but remained significant for men (β = −0.41, 95% CI = [−0.62, −0.20]) and women (β = −0.53, 95% CI = [−0.82, −0.23]). After allowing work arrangements to interact with workplace inclusion (Model 3), the negative association between workplace inclusion and psychological distress remained significant for men (β = −0.43, 95% CI = [−0.66, −0.19]) and women (β = −0.65, 95% CI = [−0.98, −0.31]). For men, the effects of infrequent telework (β = −0.18, 95% CI: [−2.20, 1.84]) and frequent telework (β = 0.43, 95% CI: [−1.68, 2.55]) were not significant. Similarly, for women, the effects of infrequent telework (β = −1.53, 95% CI: [−4.06, 1.00]) and frequent telework (β = −1.48, 95% CI: [−4.23, 1.27]) were also not significant. Regarding the moderating

effects work arrangements on the association between workplace inclusion and psychological distress, the results were nonsignificant for men, both for infrequent telework (β = 0.14, 95% CI: [−0.44, 0.72]) and frequent telework (β = −0.16, 95% CI: [−0.78, 0.46]). Similarly, for women, the moderating effects of infrequent telework (β = 0.39, 95% CI: [−0.36, 1.15]) and frequent telework (β = 0.51, 95% CI: [−0.34, 1.35]) were nonsignificant.

[Table 2 near here]

[Figure 2a near here]

On the basis of the estimates of Model 3, the average predicted value for psychological distress was presented at different levels of workplace inclusion by work arrangement, averaged across the observed values for the other covariates (Figures 2b and 2c). Among men, simple slope analysis revealed that the association between workplace inclusion and psychological distress is significant for office workers (β = −0.43, 95% CI = [−0.66, −0.19]), whereas this association is nonsignificant for infrequent teleworkers (β = −0.28, 95% CI = [−0.83, 0.27]) and frequent teleworkers (β = −0.59, 95% CI = [−1.18, 0.00]). Among women, the association between workplace inclusion and psychological distress is significant for office workers (β = −0.65, 95% CI = [−0.98, −0.31]), whereas this association is nonsignificant for infrequent teleworkers (β = −0.25, 95% CI = [−0.94, 0.44]) and frequent teleworkers (β = −0.14, 95% CI = [−0.94, 0.66]).

[Figure 2b near here]

[Figure 2c near here]

Table 3 and Figure 3a present the prospective associations of workplace inclusion with subsequent work engagement and the moderating effect of work arrangement. For the crude model without any adjustment for covariates (Model 1), workplace inclusion was significantly and positively associated with work engagement for men (β = 0.77, 95% CI: [0.72, 0.82]) and women (β = 0.70, 95% CI: [0.63, 0.78]). After adjusting for covariates (Model 2), the positive association between workplace inclusion and work engagement attenuated but remained significant for men (β = 0.08, 95% CI: [0.03, 0.13]) and women (β = 0.10, 95% CI: [0.03, 0.16]). After allowing work arrangements to interact with workplace inclusion (Model 3), the positive association between workplace inclusion and work engagement remained significant for men (β = 0.07, 95% CI = [0.02, 0.13]) and women (β = 0.13, 95% CI = [0.06, 0.20]). For men, the effects of infrequent telework (β = 0.26, 95% CI: [−0.16, 0.67]) and frequent telework (β = −0.34, 95% CI: [−0.78, 0.09]) were not significant. In contrast, for women, the effect of infrequent telework was not significant (β = 0.23, 95% CI: [−0.26, 0.71]), whereas the effect of frequent telework was significant (β = 0.89, 95% CI: [0.36, 1.41]). Regarding the moderating effects of work arrangements on the association between workplace inclusion and psychological distress, the results were nonsignificant for men, both for infrequent telework (β = −0.04, 95% CI: [−0.16, 0.08]) and frequent telework (β = 0.08, 95% CI: [−0.04, 0.21]). In contrast, for women, the moderating effect of infrequent telework was not significant (β = −0.07, 95% CI: [−0.21, 0.08]), whereas the moderating effect of frequent telework was significant (β = −0.24, 95% CI: [−0.40, −0.07]).

[Table 3 near here]

[Figure 3a near here]

On the basis of the estimates of Model 3, the average predicted value for work engagement was presented at different levels of workplace inclusion by work arrangement, averaged across the observed values for the other covariates (Figures 3b and 3c). Among men, the simple slope analysis revealed that the association between workplace inclusion and work engagement is significant for office workers (β = 0.07, 95% CI = [0.02, 0.13]) and for frequent teleworkers (β = 0.16, 95% CI = [0.03, 0.28]), whereas this association is nonsignificant for infrequent teleworkers (β = 0.03, 95% CI = [−0.09, 0.14]). Among women, the association between workplace inclusion and work engagement is significant for office workers (β = 0.13, 95% CI = [0.06, 0.20]), whereas this association is nonsignificant for infrequent teleworkers (β = 0.06, 95% CI = [−0.07, 0.20]) and frequent teleworkers (β = −0.10, 95% CI = [−0.26, 0.05]).

[Figure 3b near here]

[Figure 3c near here]

Discussion

The key findings can be summarized as follows: the longitudinal associations of workplace inclusion with psychological distress and work engagement were significant for both men and women, even after we controlled for covariates. Work arrangements moderated the prospective association between workplace inclusion and work engagement among women such that the association between workplace inclusion and work engagement is significant for office workers, whereas this association is nonsignificant for frequent teleworkers. In contrast, we found no moderating effect on work engagement among men or psychological distress for either men or women.

Interpretations

First, the present study revealed that higher workplace inclusion is prospectively associated with lower psychological distress and greater work engagement among Japanese employees, even after adjustments are made for key demographic, occupational, and baseline variables. These findings align with those of prior research demonstrating that perceived inclusion supports psychological well-being (Ehrhart and Chung, 2023) and fosters motivational states such work engagement (Duong et al., 2024). Our study contributes to this body of work by employing a longitudinal design and examining both health and work outcomes, offering more robust evidence of the long-term benefits of workplace inclusion.

Second, this study revealed that the positive association between workplace inclusion and work engagement was moderated by work arrangements among women. Specifically, the relationship was significant for women working in the office but not for those engaged in frequent telework. This finding is consistent with theoretical arguments that remote work can weaken the relational mechanisms needed for inclusion to translate into positive work outcomes (Byrd, 2022; Lauring and Jonasson, 2023), including work engagement (Bakker, 2022). Diffuse social distance, characterized by fewer spontaneous interactions and reduced access to feedback and visibility, may ameliorate the salience of inclusion in virtual settings, reducing its capacity to foster work engagement.

Third, the moderating effect of work arrangement was observed only for work engagement and not for psychological distress. One possible explanation is that work engagement is more sensitive to interpersonal exchanges and team dynamics (Bakker, 2022), which are more prevalent in inclusive workplaces but tend to diminish in remote settings (Byrd, 2022; Lauring and Jonasson, 2023). In contrast, the effects of workplace

inclusion on psychological distress did not differ significantly between those working in the office and those working remotely. This result also contrasts with findings related to other psychosocial factors at work, such as social support and psychosocial safety climate, which have a more pronounced impact on teleworkers' psychological health (Kikunaga et al., 2023; Kikunaga et al., 2024). These findings suggest potentially distinct mechanisms through which workplace inclusion influences health and work outcomes, and they highlight differences in how workplace inclusion and other psychosocial factors affect psychological health. These differences warrant further investigation.

Fourth, the moderating effect of telework emerged only among women, which may reflect gendered patterns in telework experience. As noted earlier, masculinity and gender-role norms remain prevalent in the Japanese workplace (Hofstede et al., 2010; McDaniel, 2015; Ruppanner, 2015). As such, male workers may choose to work remotely solely to maximize their productivity, or they may maintain a work-centered identity even if telework contributes to the fulfillment of family roles (Shimazu, 2015). In contrast, female workers may opt for telework due to household gender-role expectations that demand intensive caregiving, or even to simultaneously conform to the ideal-worker norm, which emphasizes full commitment to the workplace (Brinton and Mun, 2016). Indeed, unlike men, frequent telework itself appears to promote greater work engagement among women, which may have offset the positive effects of workplace inclusion. In addition, women might be more likely to remain in telework arrangements postpandemic, partly due to caregiving responsibilities and workplace flexibility preferences (Leonardi et al., 2024). In contrast, men may have been more likely to return to the office between the survey waves, leading to greater variability in

their actual work setting than in their reported baseline status; this could have created an inaccuracy in the estimated impact of work arrangements at baseline.

Implications

Theoretically, the findings of this study contribute to the growing literature on workplace inclusion by highlighting its dual benefits for mental health and work engagement from a long-term perspective. The results also suggest that the mechanisms linking workplace inclusion to health and work outcomes may differ. In particular, the positive effect of workplace inclusion on work engagement may be contingent on work arrangements, such that its benefits are diminished in environments that lack interpersonal interaction. In contrast, unlike other psychosocial factors, the preventive effect of workplace inclusion on mental health may persist regardless of work arrangements.

Practically, the findings suggest that ensuring workplace inclusion may be an effective measure to promote employee well-being and motivation. Strategic human resource management is an example of such a measure (Eshete and Birbirssa, 2024); however, these interventions may need to be tailored on the basis of work arrangements. In particular, for frequent teleworkers, especially women, alternative or supplemental approaches, such as intentional virtual team-building, proactive leader outreach, or digital inclusion tools, may be needed to ensure that inclusion is experienced fully and consistently across work contexts. Failing to adapt inclusion practices to remote environments could unintentionally widen motivation gaps between remote and in-office employees.

Limitations

Several limitations warrant caution in interpreting the findings. First, although this study employed a longitudinal design, causal inferences remain limited due to potential unobserved confounding. For example, individual personality traits or work preferences may influence both perceived inclusion and employee health and work outcomes (Lall-Trail et al., 2023). Future research could employ experience sampling or within-person designs to better control for such stable individual differences.

Second, the measurement of workplace inclusion in this study was based on individual-level perceptions. While this aligns with conceptualizing inclusion at an individual level, it may not capture broader organizational climates or interpersonal conditions (Shore and Chung, 2024). Therefore, future studies may examine whether the anticipated impact on health and work outcomes differs at the individual, interpersonal, and organizational levels on the basis of various operationalizations of inclusion (Park et al., 2023).

Third, this study classified work arrangements on the basis of responses at baseline. It is possible that some employees changed their work arrangements between baseline and follow-up, particularly among men, which may have diluted the observed moderating effects (Heiden et al., 2023). Future research could incorporate repeated measures of work arrangement to capture dynamic work arrangements more accurately over time.

Conclusion

This study examined the prospective associations of workplace inclusion with psychological distress and work engagement among Japanese employees. The results revealed that inclusion was significantly associated with lower levels of psychological distress and greater levels of work engagement for both men and women. Additionally,

the beneficial effect of inclusion on work engagement was moderated by work arrangement among women, with stronger effects observed for office workers than for frequent teleworkers. These findings emphasize the importance of fostering inclusive work environments to promote employee well-being and motivation in the long term. They also highlight the need to consider contextual factors, such as work arrangements, when designing interventions to promote inclusion, especially in the postpandemic era, where organizations continue to navigate remote or hybrid work structures.

Disclosure statement

No potential conflicts of interest were reported by the authors.

Data availability statement

The data supporting the findings of this study are currently not available for secondary use.

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Figures and tables

Table 1. Characteristics of the study participants at baseline (n = 3840)

	Mean (SD)	n (%)
Demographic characteristics		
Gender		
Men		2628 (68.4)
Women		1212 (31.6)
Age	45.4 (9.9)	
20–29 years		235 (6.1)
30–39 years		935 (24.3)
40–49 years		1256 (32.7)
50–59 years		1140 (29.7)
60–64 years		276 (7.2)
Educational attainment		
High school graduate or lower		784 (20.4)
Vocational or junior college graduate		514 (13.4)
College graduate or higher		2542 (66.2)
Occupational characteristics		
Employment status		
Part-time		325 (8.5)
Full-time		3515 (91.5)
Occupation		
Manual		759 (19.8)

Nonmanual		1800 (46.9)
Professional		775 (20.2)
Others		506 (13.2)
Positional rank		
General employee		1793 (46.7)
Assistant manager		1425 (37.1)
Department head or higher		297 (7.7)
Others		325 (8.5)
Company size		
300 employees or less		936 (24.4)
300–1000 employees		898 (23.4)
1000–3000 employees		644 (16.8)
3000–10000 employees		606 (15.8)
10000 employees or more		756 (19.7)
Weekly work hours		
34 hours or less		548 (14.3)
35–39 hours		814 (21.2)
40–44 hours		1439 (37.5)
45 hours or more		1039 (27.1)
Work arrangement		
Office work		2875 (74.9)
Infrequent telework (1–2 days)		550 (14.3)
Frequent telework (3 days or more)		415 (10.8)
Psychological distress	5.43 (5.78)	

No serious psychological distress (K6 ≤ 12)		3391 (88.3)
Serious psychological distress (K6 ≥ 13)		449 (11.7)
Work engagement	3.25 (1.21)	
Workplace inclusion	3.15 (0.82)	

SD: Standard deviation.

Table 2. Prospective associations between workplace inclusion and psychological distress

	Estimates (95% confidence interval)					
	Model 1		Model 2		Model 3	
	Men	Women	Men	Women	Men	Women
Workplace inclusion	−2.42 (−2.68, −2.17)**	−2.68 (−3.07, −2.29)**	−0.41 (−0.62, −0.20)**	−0.53 (−0.82, −0.23)**	−0.43 (−0.66, −0.19)**	−0.65 (−0.98, −0.31)**
Work arrangements						
Office work					Reference	Reference
Infrequent telework					−0.18 (−2.20, 1.84)	−1.53 (−4.06, 1.00)
Frequent telework					0.43 (−1.68, 2.55)	−1.48 (−4.23, 1.27)
Interaction						
Workplace inclusion × Infrequent telework					0.14 (−0.44, 0.72)	0.39 (−0.36, 1.15)
Workplace inclusion × Frequent telework					−0.16 (−0.78, 0.46)	0.51 (−0.34, 1.35)
Age						
20–29 years			Reference	Reference	Reference	Reference
30–39 years			0.03 (−0.85, 0.91)	−0.35 (−1.14, 0.45)	0.04 (−0.83, 0.92)	−0.32 (−1.12, 0.47)
40–49 years			−0.11 (−0.98, 0.75)	−0.31 (−1.10, 0.49)	−0.10 (−0.97, 0.77)	−0.28 (−1.07, 0.51)
50–59 years			−0.04 (−0.92, 0.84)	−0.26 (−1.09, 0.56)	−0.02 (−0.89, 0.86)	−0.25 (−1.08, 0.57)
60–64 years			−1.20 (−2.21, −0.19)*	−0.68 (−1.87, 0.51)	−1.16 (−2.17, −0.15)*	−0.66 (−1.85, 0.53)
Educational attainment						
High school graduate or lower			Reference	Reference	Reference	Reference
Vocational or junior college graduate			−0.01 (−0.58, 0.57)	−1.03 (−1.76, −0.30)**	−0.01 (−0.58, 0.57)	−1.02 (−1.75, −0.29)**
College graduate or higher			−0.13 (−0.53, 0.28)	−0.92 (−1.55, −0.28)**	−0.13 (−0.53, 0.28)	−0.92 (−1.55, −0.28)**
Employment status						
Part-time			Reference	Reference	Reference	Reference
Full-time			−0.86 (−1.58, −0.14)*	0.39 (−0.31, 1.08)	−0.85 (−1.57, −0.12)*	0.40 (−0.30, 1.10)
Occupation						
Manual			Reference	Reference	Reference	Reference

Nonmanual			0.20 (−0.25, 0.65)	0.28 (−0.40, 0.95)	0.20 (−0.25, 0.65)	0.28 (−0.39, 0.95)
Professional			0.23 (−0.26, 0.72)	0.47 (−0.47, 1.40)	0.24 (−0.24, 0.74)	0.44 (−0.50, 1.37)
Others			0.26 (−0.27, 0.80)	0.30 (−0.58, 1.18)	0.27 (−0.26, 0.81)	0.30 (−0.58, 1.18)
Positional rank						
General employee			Reference	Reference	Reference	Reference
Assistant manager			0.01 (−0.34, 0.36)	−0.48 (−1.05, 0.10)	0.00 (−0.36, 0.35)	−0.48 (−1.06, 0.09)
Department head or higher			−0.25 (−0.84, 0.33)	−0.88 (−2.31, 0.56)	−0.27 (−0.86, 0.31)	−0.94 (−2.39, 0.50)
Company size						
300 employees or less			Reference	Reference	Reference	Reference
300–1000 employees			0.18 (−0.26, 0.62)	0.08 (−0.57, 0.72)	0.18 (−0.26, 0.62)	0.07 (−0.57, 0.72)
1000–3000 employees			0.00 (−0.48, 0.48)	0.50 (−0.24, 1.23)	0.00 (−0.48, 0.48)	0.51 (−0.23, 1.24)
3000–10000 employees			−0.02 (−0.52, 0.47)	0.43 (−0.29, 1.16)	−0.02 (−0.51, 0.48)	0.44 (−0.29, 1.16)
10000 employees or more			−0.16 (−0.63, 0.30)	0.43 (−0.25, 1.11)	−0.17 (−0.63, 0.30)	0.43 (−0.26, 1.11)
Weekly work hours						
34 hours or less			Reference	Reference	Reference	Reference
35–39 hours			−0.44 (−1.01, 0.13)	−0.11 (−0.77, 0.56)	−0.45 (−1.02, 0.12)	−0.09 (−0.76, 0.57)
40–44 hours			−0.29 (−0.81, 0.23)	0.03 (−0.58, 0.65)	−0.30 (−0.82, 0.22)	0.03 (−0.58, 0.65)
45 hours or more			−0.32 (−0.85, 0.21)	0.08 (−0.69, 0.86)	−0.34 (−0.86, 0.19)	0.06 (−0.71, 0.84)
Psychological distress (baseline)			0.71 (0.68, 0.74)**	0.76 (0.71, 0.80)**	0.71 (0.68, 0.74)**	0.75 (0.71, 0.80)**
Intercept	18.9 (18.1, 19.8)**	20.0 (18.8, 21.3)**	10.2 (8.80, 11.7)**	9.32 (7.71, 10.9)**	9.99 (8.57, 11.4)**	9.67 (7.99, 11.3)**

SE: Standard error.

* $p < 0.05$, ** $p < 0.01$.

Table 3. Prospective associations between workplace inclusion and work engagement

	Estimates (95% confidence interval)					
	Model 1		Model 2		Model 3	
	Men	Women	Men	Women	Men	Women
Workplace inclusion	0.77 (0.72, 0.82)**	0.70 (0.63, 0.78)**	0.08 (0.03, 0.13)**	0.10 (0.03, 0.16)**	0.07 (0.02, 0.13)*	0.13 (0.06, 0.20)**
Work arrangements						
Office work					Reference	Reference
Infrequent telework					0.26 (−0.16, 0.67)	0.23 (−0.26, 0.71)
Frequent telework					−0.34 (−0.78, 0.09)	0.89 (0.36, 1.41)**
Interaction						
Workplace inclusion × Infrequent telework					−0.04 (−0.16, 0.08)	−0.07 (−0.21, 0.08)
Workplace inclusion × Frequent telework					0.08 (−0.04, 0.21)	−0.24 (−0.40, −0.07)**
Age						
20–29 years			Reference	Reference	Reference	Reference
30–39 years			0.04 (−0.14, 0.22)	0.02 (−0.13, 0.18)	0.04 (−0.14, 0.22)	0.03 (−0.12, 0.18)
40–49 years			0.01 (−0.17, 0.19)	−0.02 (−0.17, 0.13)	0.02 (−0.16, 0.20)	−0.02 (−0.17, 0.14)
50–59 years			−0.01 (−0.19, 0.17)	0.08 (−0.08, 0.24)	−0.01 (−0.19, 0.18)	0.09 (−0.07, 0.25)
60–64 years			0.14 (−0.07, 0.35)	0.16 (−0.07, 0.40)	0.15 (−0.06, 0.36)	0.17 (−0.06, 0.41)
Educational attainment						
High school graduate or lower			Reference	Reference	Reference	Reference
Vocational or junior college graduate			−0.06 (−0.17, 0.06)	0.09 (−0.05, 0.23)	−0.05 (−0.17, 0.07)	0.09 (−0.05, 0.23)
College graduate or higher			−0.08 (−0.17, 0.00)	0.03 (−0.09, 0.15)	−0.08 (−0.16, 0.00)	0.02 (−0.10, 0.14)
Employment status						
Part-time			Reference	Reference	Reference	Reference
Full-time			−0.01 (−0.16, 0.14)	−0.05 (−0.18, 0.09)	0.00 (−0.15, 0.15)	−0.05 (−0.18, 0.09)
Occupation						
Manual			Reference	Reference	Reference	Reference
Nonmanual			0.03 (−0.07, 0.12)	0.01 (−0.12, 0.14)	0.02 (−0.07, 0.12)	0.01 (−0.12, 0.14)
Professional			−0.00 (−0.10, 0.10)	0.05 (−0.13, 0.23)	0.01 (−0.10, 0.11)	0.05 (−0.13, 0.23)

Others			0.01 (−0.10, 0.12)	−0.02 (−0.19, 0.15)	0.01 (−0.10, 0.12)	−0.04 (−0.21, 0.13)
Positional rank						
General employee			Reference	Reference	Reference	Reference
Assistant manager			0.09 (0.02, 0.16)*	0.02 (−0.09, 0.13)	0.08 (0.01, 0.16)*	0.02 (−0.09, 0.13)
Department head or higher			0.22 (0.10, 0.34)**	0.20 (−0.08, 0.48)	0.21 (0.09, 0.33)**	0.22 (−0.06, 0.50)
Company size						
300 employees or less			Reference	Reference	Reference	Reference
300–1000 employees			0.04 (−0.05, 0.13)	0.03 (−0.10, 0.15)	0.04 (−0.05, 0.13)	0.04 (−0.09, 0.16)
1000–3000 employees			−0.07 (−0.16, 0.03)	0.13 (−0.02, 0.27)	−0.06 (−0.16, 0.03)	0.14 (0.00, 0.28)
3000–10000 employees			−0.05 (−0.15, 0.05)	0.03 (−0.11, 0.17)	−0.04 (−0.14, 0.06)	0.03 (−0.11, 0.17)
10000 employees or more			0.00 (−0.09, 0.10)	−0.00 (−0.13, 0.13)	0.01 (−0.09, 0.10)	0.00 (−0.14, 0.13)
Weekly work hours						
34 hours or less			Reference	Reference	Reference	Reference
35–39 hours			−0.06 (−0.18, 0.06)	−0.13 (−0.25, 0.00)	−0.06 (−0.18, 0.06)	−0.14 (−0.26, −0.01)*
40–44 hours			−0.13 (−0.23, −0.02)*	−0.07 (−0.19, 0.04)	−0.13 (−0.23, −0.02)*	−0.08 (−0.20, 0.04)
45 hours or more			−0.04 (−0.15, 0.07)	−0.04 (−0.18, 0.11)	−0.04 (−0.15, 0.07)	−0.03 (−0.18, 0.12)
Work engagement (baseline)			0.70 (0.67, 0.74)**	0.74 (0.70, 0.79)**	0.70 (0.67, 0.74)**	0.74 (0.70, 0.79)**
Intercept	0.89 (0.72, 1.05)**	1.02 (0.78, 1.25)**	0.82 (0.55, 1.09)**	0.53 (0.24, 0.81)**	0.82 (0.54, 1.10)**	0.41 (0.11, 0.70)**

SE: Standard error.

* $p < 0.05$, ** $p < 0.01$.

Figure 1. Flow diagram of the participant selection process

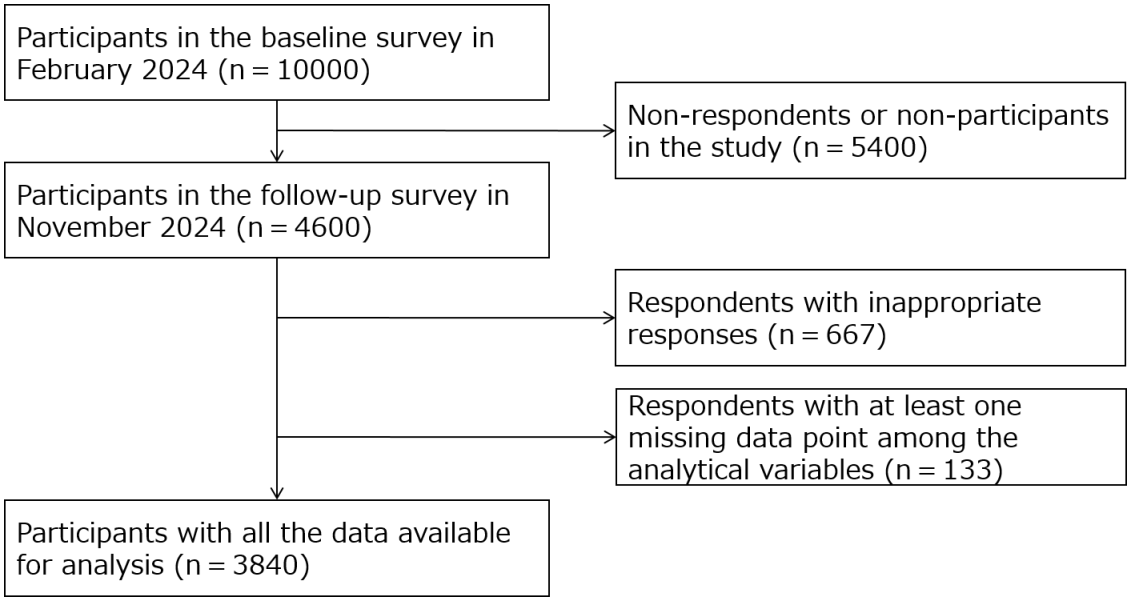
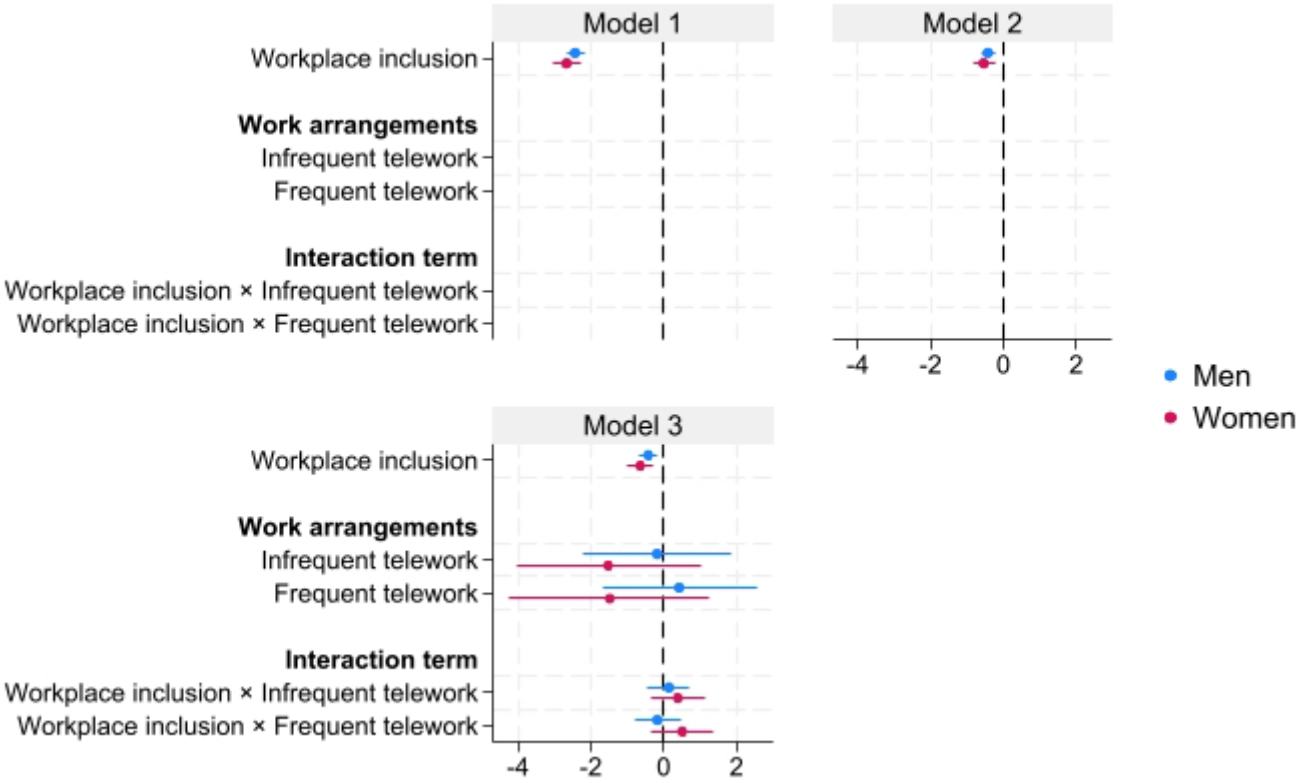


Figure 2a. Graphical representation of regression coefficients estimating the association with psychological distress



Estimates of covariates were omitted for simplicity.

Figure 2b. Average value of psychological distress predicted by workplace inclusion and work arrangements for men

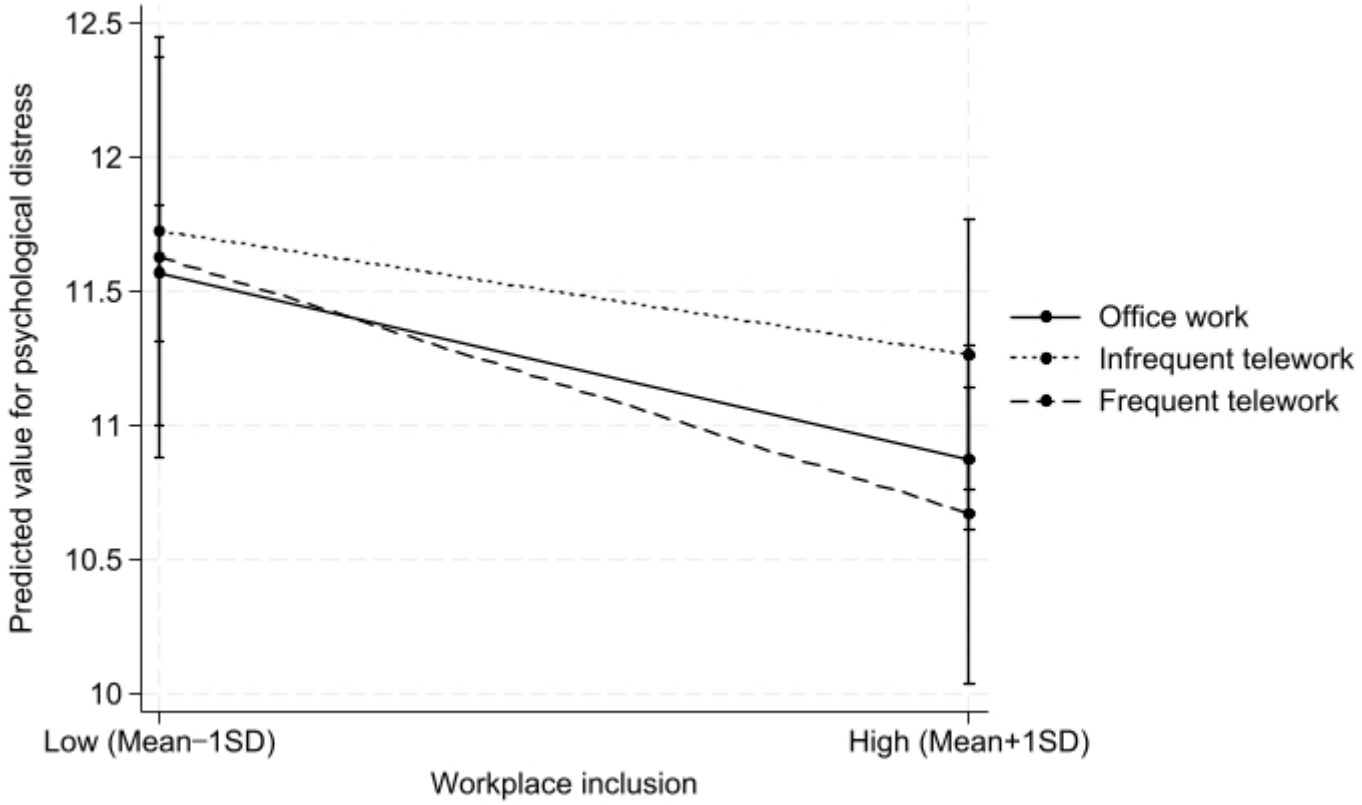


Figure 2c. Average value of psychological distress predicted by workplace inclusion and work arrangements for women

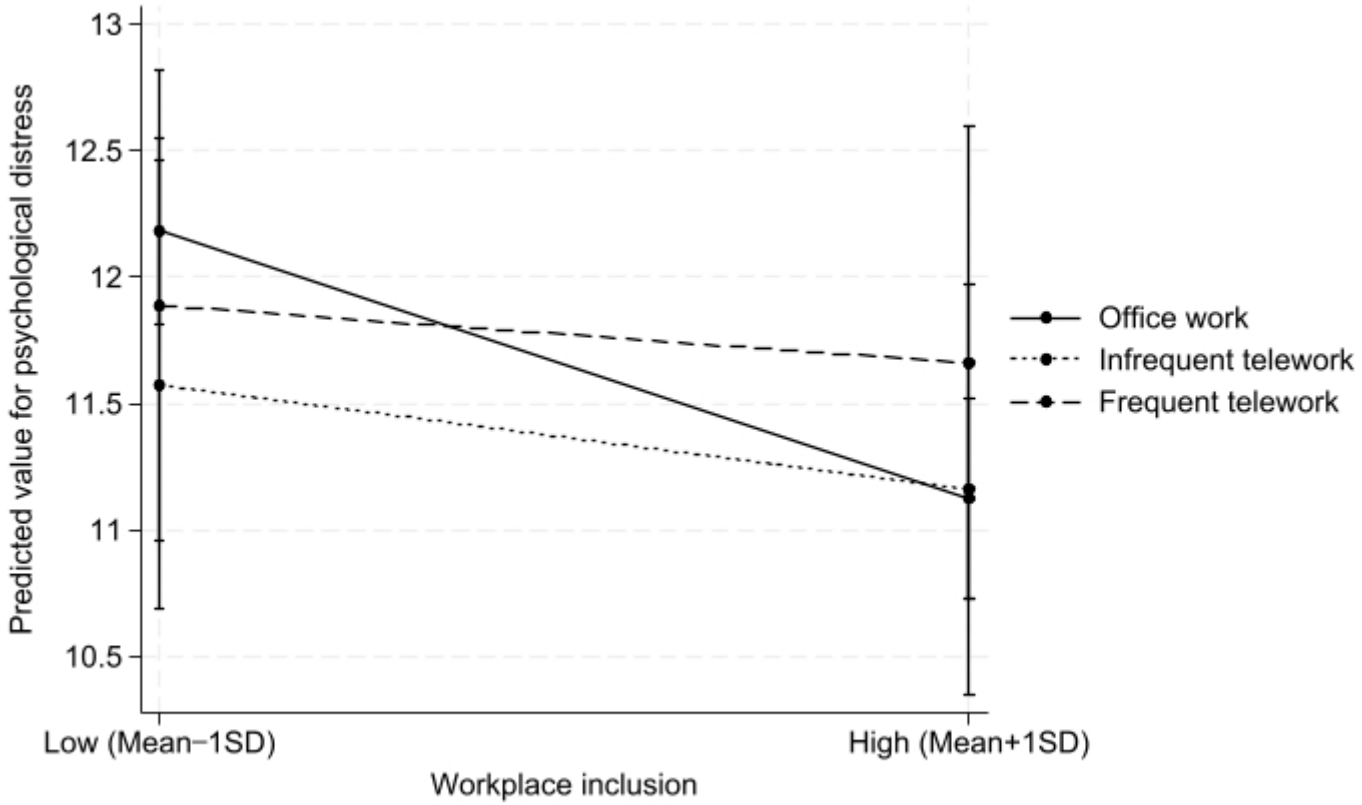
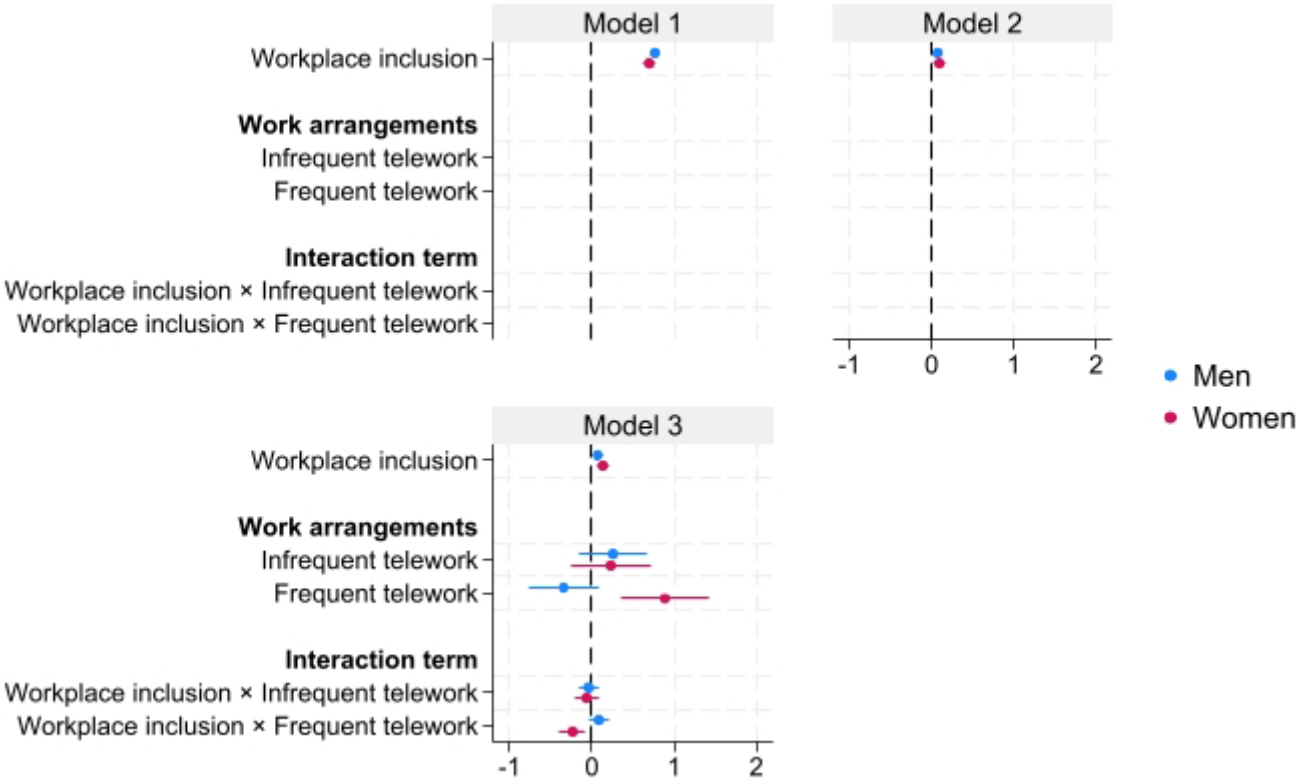


Figure 3a. Graphical representation of regression coefficients estimating the association with work engagement



Estimates of covariates were omitted for simplicity.

Figure 3b. Average value of work engagement predicted by workplace inclusion and work arrangements for men

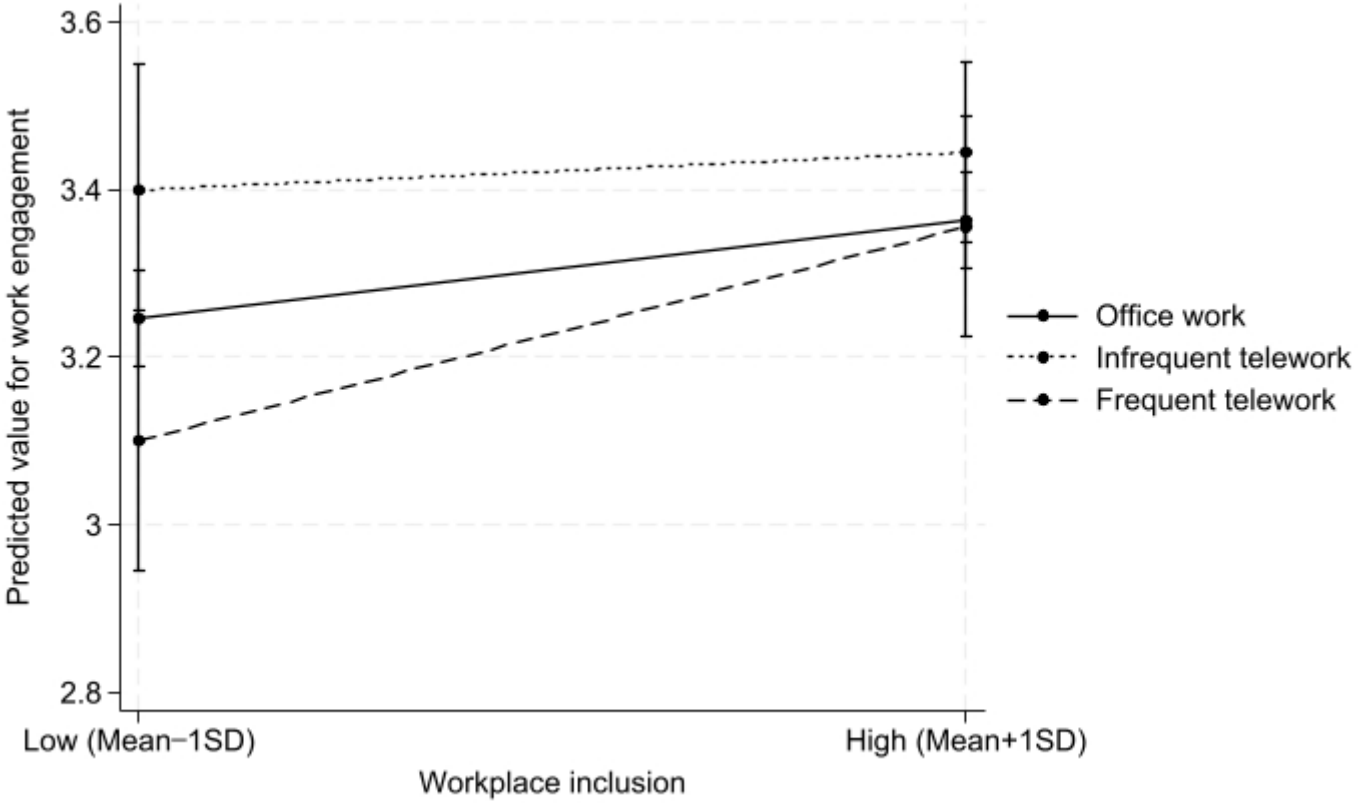


Figure 3c. Average value of work engagement predicted by workplace inclusion and work arrangements for women