

Remote Work Phenomenon and the Job Performance of Knowledge Workers

Lucie Ottová¹

¹ Palacký University Olomouc, Faculty of Arts; Křížkovského 10, 779 00 Olomouc; lucie.ottova01@upol.cz

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Abstract Changing work environments and the transformation of traditional working models into flexible ones have led to the rise of hybrid approaches combining remote and on-site working. This evolution, accelerated by technological advances and the COVID-19 pandemic, has redefined the way employees perform their tasks and how this affects their job performance. This study presents the results of empirical research on the impact of this transition on the job performance of knowledge workers. The study compares on-site and remote environments to determine how different work arrangements affect the job performance of men and women. The results of the study provide valuable insights for organizations seeking to optimize job performance in the context of an ever-changing work environment.

Keywords: job performance, remote work, knowledge workers

1. INTRODUCTION

The COVID-19 pandemic triggered a fundamental shift in the way we work, leading to the rapid adoption of flexible work arrangements. Remote work became the predominant model, particularly for knowledge workers whose roles are not tied to physical office presence. This transition, initially a response to public health requirements, has evolved into a permanent change in the work paradigm. The hybrid work model, which combines remote work with traditional office settings, has now become common practice.

This article presents the findings of a research project focused on analyzing job performance in the context of remote work for men and women. The study was conducted among knowledge workers at an international manufacturing company based in the Czech Republic and addressed current issues in the work environment, specifically the performance of knowledge workers operating both on-site and remotely.

The research included a representative sample of 400 knowledge workers, with 262 providing valid responses, forming a robust basis for analysis. Methodologically, the study was based on a quantitative survey, enabling systematic data collection from a large number of respondents and subsequent analysis using statistical methods. This approach was chosen to gain an objective insight into the differences in job performance between the two environments

and to identify key factors influencing the performance of knowledge workers.

2. TERMINOLOGY AND THEORETICAL BACKGROUND OF THE RESEARCH

Job performance represents a long-standing area of research in work psychology, focusing on understanding the factors influencing efficiency, productivity, and employee satisfaction in various work contexts. This chapter aims to clarify the fundamental terminology associated with the concept of job performance and studies examining job performance in relation to remote work.

2.1 Terminology

The scientific exploration of knowledge workers' performance required the establishment of a scientifically recognized categorization of job performance. In this context, significant scientific studies on job performance categorization and research supporting its importance in investigation are introduced below.

Research on job performance began in the early 20th century and extended to the mid-1980s. In 1976, Hackman and Oldham introduced a model designed to define the conditions that foster employees' intrinsic motivation to complete tasks. During this period, scientific studies focused on the relationships between personality traits and job performance.

In the mid-1980s, a major shift occurred in the research approach to this field. Barrick et al. (2001) summarized findings from 15 meta-analyses that examined the relationship between personality characteristics defined by the Five-Factor Model (FFM) and job performance.

Motowidlo and Kell (2013) proposed a scientifically recognized categorization of job performance that distinguishes between task performance and contextual performance. This distinction is crucial for capturing all significant aspects affecting overall organizational efficiency in performance evaluations. According to Motowidlo and Van Scotter (1994), task performance includes activities directly associated with the transformation of raw materials into products and the distribution of necessary materials, while contextual performance focuses on behaviors that enhance organizational

effectiveness by influencing the psychological, social, and organizational environment.

Further exploring job performance, Motowidlo and Kell (2013) noted that contextual performance is closely linked to organizational citizenship behavior (OCB), which refers to actions that benefit the organization. OCB involves voluntary activities that are not directly tied to rewards. In contrast, counterproductive work behavior (CWB) decreases organizational value.

2.2 Theoretical aspects of examining job performance and remote working among knowledge workers

The initial attempts to study flexible work arrangements date back to the 1980s. A study by Pierce and Newstrom (1983) sought to empirically examine the relationship between various attitudinal variables and employee behaviors with elements of flexible work schedules. The study confirmed a positive correlation between schedule flexibility and performance and found a connection to reduced employee absenteeism. In the 1990s, Kogi (1991) explored flexible work schedules, highlighting new models such as compressed workweeks that extend working hours beyond standard days with flexibility for workers. However, he acknowledged potential safety and health risks, including fatigue, disrupted sleep, impaired social life, and health issues from excessive or irregular schedules.

A study by Masuda et al. (2012) investigated flexible work arrangements and performance through managers' evaluations of their employees across Anglo-American, Latin American, and Asian regions. It revealed that cultural context plays a critical role in utilizing flexible work forms. Maintaining contact between workers also influences performance in remote work settings. Coenen and Kok (2014) examined the impact of remote work and flexible schedules on team performance in new product development projects. Their research indicated that while remote work generally enhances performance, some level of direct interaction is necessary to mitigate potential downsides and maintain quality knowledge exchange. They emphasized the importance of providing adequate support resources and sustaining personal contact within flexible work arrangements.

The negative impact of remote work on social interaction was highlighted by Orhan et al. (2016), who studied remote work dynamics. While they found correlations between remote work and employee performance, they also noted reduced turnover tendencies within organizations.

In the post-pandemic era, several studies have explored job performance under remote work conditions. Toscano and Zappalà (2021) investigated the relationship between job performance, remote work, and personality traits, emphasizing the variability of outcomes based on individual circumstances. Key findings showed that remote job performance is influenced by personality traits, living conditions, and engagement levels, particularly communication with management. Their research underlined the complexity of remote work's impact, with individual circumstances significantly affecting effectiveness and satisfaction.

Rebolledo et al. (2021) found that remote work boosts performance and productivity by allowing employees to manage their time more effectively and reducing commuting-related stress. This aligns with other studies across different sectors, such as a 2023 article by Mazur and Chukhraye titled "The Impact of Remote Work on Employee Productivity in the Modern World." They recognized both benefits and challenges of remote work. Benefits include

enhanced performance due to fewer distractions, elimination of commuting fatigue, and better work-life balance. They also discussed the transition to a flexible and technologically advanced work style, noting that flexible schedules and improved work-life balance enhance productivity. However, they highlighted challenges such as isolation and unsuitable work environments that can negatively affect performance.

Similarly, Abdulrahim and Yousif (2023) studied remote work's impact on performance in Saudi Arabia's financial sector, finding positive effects through increased job satisfaction and better work-life balance. Despite challenges like physical isolation and reduced direct colleague interaction, the study suggested that remote work fosters accountability, self-regulation, and overall employee well-being.

Research on remote work and its impact on performance demonstrates its potential to significantly improve efficiency for employees and organizations. Zackery et al. (2022) called for revisiting existing business practices, such as managerial support, inclusive culture building, and informal flexibility integration. Overall, studies suggest that with proper setup and attention to individual needs, remote work can greatly enhance productivity, employee satisfaction, and work-life balance.

The findings from existing research were used to formulate the research question and hypotheses.

3. RESEARCH QUESTION AND HYPOTHESES

In relation to the purpose of the research, the research question is as follows: Is there a difference in the job performance of men and women when working on-site versus remotely?

Given the nature of the data, which involves comparing two sets of values obtained from the same subjects under different conditions, a paired t-test was selected for evaluation. To use the paired t-test, it is necessary to establish the null hypothesis H_0 and the alternative H_1 .
 H_0 : There is no difference in the job performance of men and women in on-site and remote work.

H_1 : There is a difference in the job performance of men and women in on-site and remote work.

3.1 Methods

Job performance was examined using the Individual Work Performance Questionnaire (IWPQ) in a version translated into Czech by Horčíčková (2019). This method includes three main dimensions:

- Task Performance – this dimension focuses on the efficiency and quality of performance in performing the tasks that are part of the job role.
- Contextual Performance – includes behaviours that support the organisational environment, such as teamwork, willingness to help colleagues and contributing to the organisational climate.
- Counterproductive Work Behavior CWB – Evaluates negative behaviors that interfere with the work environment or organizational goals, such as avoidance of duties, conflicts with colleagues, or rule breaking.

The questionnaire contains 18 items, which are divided into the three subscales mentioned above.

Picture 1: Items IWPQ

Task performance	
In the past 3 months...	
TP1...	I was able to plan my work so that I finished it on time
TP2...	I kept in mind the work result I needed to achieve.
TP3...	I was able to set priorities.
TP4...	I was able to carry out my work efficiently.
TP5...	I managed my time well.
Contextual performance	
In the past 3 months...	
CP6...	On my own initiative, I started new tasks when my old tasks were completed
CP7...	I took on challenging tasks when they were available.
CP8...	I worked on keeping my job-related knowledge up-to-date.
CP9...	I worked on keeping my work skills up-to-date.
CP10...	I came up with creative solutions for new problems
CP11...	I took on extra responsibilities
CP12...	I continually sought new challenges in my work.
CP13...	I actively participated in meetings and/or consultations.
Counterproductive work behaviour	
In the past 3 months...	
CWB14...	I complained about minor work-related issues at work.
CWB15...	I made problems at work bigger than they were.
CWB16...	I focused on the negative aspects of a situation at work instead of the positive aspects.
CWB17...	I talked to colleagues about the negative aspects of my work.
CWB18...	I talked to people outside of the organization about the negative aspects of my work.

Source: own based on questionnaire IWPQ, Horčíčková (2019)

To minimize the risk of response bias when repeatedly completing the IWPQ questionnaire, which uses a Likert scale, data were collected in two phases. The first phase involved evaluating job performance in the context of on-site work, while the second phase focused on remote work, with a one-day interval between the two phases.

Data collection took place in May 2024 within a corporate manufacturing company based in the Czech Republic. The research sample consisted of 400 employees invited to participate through an online questionnaire, with a response rate of 262 (65.5%). Only respondents with at least six months of remote work experience were included in the research. The questionnaire included items addressing basic demographic and professional information about the respondents, as well as questions assessing their experiences with both on-site and remote work arrangements.

Out of the 262 respondents, 165 were men, 94 were women, and 3 identified as another gender. Since respondents identifying as a non-binary gender constituted less than 1% of the total sample, they were not included in the analysis comparing the job performance of men and women for methodological reasons. This decision was made to ensure adequate group sizes and the statistical significance of results.

As part of the data collection on the job performance of knowledge workers, respondents were also required to provide information about their gender. This information was included in the analysis to account for potential differences in how men and women organize their work and family responsibilities. Previous research suggests that women often bear a greater burden of family and childcare responsibilities. As noted in the study by Mussida and Patimo (2020), this could influence their job performance in a remote work setting. It is hypothesized that the ability to flexibly combine work and family activities could contribute to more effective use of working time.

Table 1: distribution of respondents by gender

Gender	Percentage
Men	63%
Women	36%
Other	<1%

Source: own processing

4. DATA ANALYSIS AND RESULTS

The research question and hypotheses are answered using paired t-test.

A paired t-test was used to evaluate the data, as it consisted of two sets of measurements conducted on the same subjects under two different conditions: on-site work and remote work.

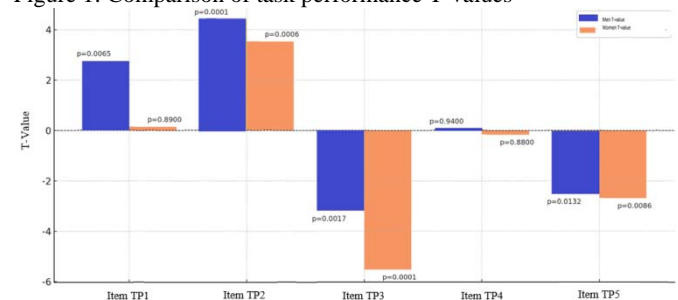
Key terms for the paired t-test include the null hypothesis (H_0), alternative hypothesis (H_1), T-statistic (or T-value), and P-value. The null hypothesis (H_0) assumes that there is no difference between the two groups, while the alternative hypothesis (H_1) suggests the opposite. The T-statistic is calculated as the ratio of the mean differences between pairs to the standard error of the differences, providing a measure of deviation from the expected null difference. The P-value represents the probability that the observed difference occurred by chance if the null hypothesis is true. This value serves as the criterion for deciding whether to reject the null hypothesis.

Task Performance

The results of the analysis indicate significant differences in performance between on-site and remote work, depending on the nature of the Task Performance (TP) items and gender. Among men, statistically significant differences were found for TP1, TP2, TP3, and TP5, while TP4 showed no significant difference. For women, significant differences were observed in TP2, TP3, and TP5, while no significant differences were found for TP1 and TP4.

Positive T-values for certain items suggest better performance during on-site work, whereas negative T-values indicate higher performance during remote work. These findings confirm that differences in performance are influenced not only by the work environment but also by the specific requirements of individual tasks.

Figure 1: Comparison of task performance T-values



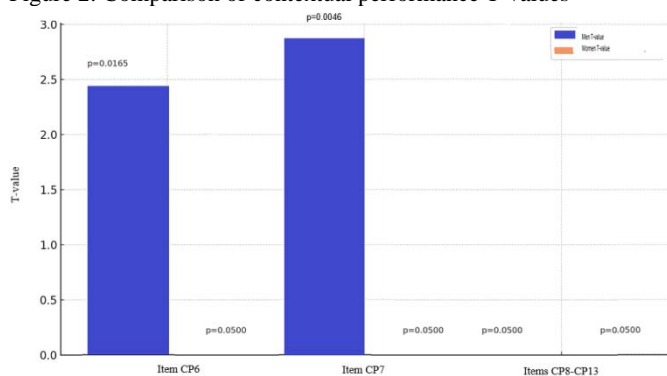
Source: own processing

Contextual performance

The analysis of contextual performance revealed significant differences between on-site and remote work modes for men, while no statistically significant differences were found for women. Among men, significant differences were particularly observed in items CP6 and CP7, whereas items CP8 through CP13 showed no significant differences. For women, none of the items from CP6 to CP13 were associated with significant differences.

These findings suggest potential gender differences in how the work environment affects contextual performance, with men exhibiting greater sensitivity to changes in the work environment for certain items.

Figure 2: Comparison of contextual performance T-values



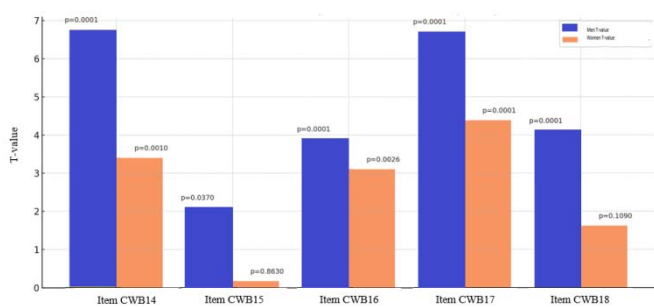
Source: own processing

Counterproductive behavior

The analysis of counterproductive behavior between on-site work and remote work revealed that all significant differences were associated with higher levels of counterproductive behavior during on-site work. Among men, statistically significant differences were identified in all five evaluated areas of counterproductive behavior, with the highest T-values observed for items CWB14 and CWB17. For women, significant differences were found in three items: CWB14, CWB16, and CWB17, while no statistically significant differences were observed for items CWB15 and CWB18.

The absence of negative T-values indicates that counterproductive behavior was more frequent in all cases during on-site work than remote work. These findings suggest that working on-site at the employer's premises may pose a higher risk of counterproductive behavior, likely due to factors such as direct social interaction, workplace pressure, or supervision, which are less prevalent in remote work settings.

Figure 3: Comparison of T-values of counterproductive work behaviour



Source: own processing

The result of the data analysis using the paired t-test is as follows:

- The null hypothesis (H_0) was rejected.
- The alternative hypothesis (H_1) was supported.

The research findings demonstrated that the work mode, whether on-site at the employer's premises or remote work, affects various dimensions of job performance, including task performance, contextual performance, and counterproductive behavior. While task performance exhibited variable differences between genders, with a greater impact of work mode on specific tasks, contextual performance was influenced primarily among men, though to a limited extent. In contrast, women showed no statistically significant differences in this area.

The most pronounced results were observed in counterproductive behavior, which was consistently higher during on-site work compared to remote work, especially among men, who displayed significant differences across all evaluated categories.

5. CONCLUSION

The aim of this article was to present the subject and findings of a research project focused on work performance under on-site and remote work conditions, addressing the research question of whether there is a difference in work performance with respect to gender and providing evidence to support the hypothesis. The research identified a difference in work performance between on-site and remote work, supported by a paired t-test, which showed that the work performance of men and women differs in both work environments.

The answer to the research question is as follows: There is a difference in the job performance of men and women when working on-site versus remotely. The alternative hypothesis (H_1) was supported, indicating that gender differences exist in work performance across these work settings.

These findings highlight the importance of tailoring work conditions and environments to individual and team needs. Remote work may offer certain advantages, such as reducing counterproductive behavior and increasing efficiency for specific tasks, while on-site work may be more suitable for fostering social interactions and meeting some contextual requirements. Gender differences in responses to work environments suggest the need for a gender-sensitive approach when designing work strategies.

Overall, the research underscores the need for further exploration of how work environments impact various aspects of performance to optimize work processes and enhance employee satisfaction and productivity.

Sources

1. ABDULRAHIM, Hiyam and YOUSIF, Ghadda, 2023. Remote Work Implications on Productivity of Workers in the Saudi Financial Sector. Online. International Journal of Professional Business Review. 8(4). E-ISSN 2525-3654. Available at: <https://doi.org/10.26668/businessreview/2023.v8i4.1064>. [cit. 2024-07.27].
2. BARRICK, R. Murray; MOUNT, K. Michael and JUDGE, T. A. Timothy, 2008. Personality and performance at the beginning of the new millennium: What do we know and where do we go next? Online. International Journal of Selection and Assessment. 9-30. Available at: <https://doi.org/10.1111/1468-2389.00160>. [cit. 2024-07.27].
3. COENEN, Marja and KOK, A. Robert, 2014. Workplace flexibility and new product development performance: The role of telework and flexible work schedules. Online. European Management Journal, 32(4), 564-576. ISSN 0263-2373. Available at: <https://doi.org/10.1016/j.emj.2013.12.003>. [cit. 2024-07.27].
4. HACKMAN, J. Richard and OLDFHAM, R. Greg, 1976. Motivation through the design of work: Test of a theory. Online. Organizational Behavior and Human Performance. 16(2), 250-279. Available at: [https://doi.org/10.1016/0030-5073\(76\)90016-7](https://doi.org/10.1016/0030-5073(76)90016-7). [cit. 2024-07.27].
5. HORČIČKOVÁ, Vendula, 2019. Překlad a adaptace dotazníku na posouzení vlastního pracovního výkonu (IWPQ). Online, diplomová práce, vedoucí Jakub Procházka. Masarykova univerzita. Available at: https://is.muni.cz/th/yy7us/Horcickova_FINAL.pdf. [cit. 2024-07.27].

6. KOGI, Kazutaka, 1991. Job content and working time: The scope for joint change. Online: *Ergonomics*. 1991, 34(6), 757-773. Available at: <https://doi.org/10.1080/00140139108967349>. [cit. 2024-07.27].
7. MASUDA, D. Aline et al. 2012. Flexible Work Arrangements Availability and their Relationship with Work-to-Family Conflict, Job Satisfaction, and Turnover Intentions: A Comparison of Three Country Clusters. Online. *Applied Psychology*. 61. 1-29. Available at: <https://doi.org/10.1111/j.1464-0597.2011.00453.x>. [cit. 2024-07.27].
8. MAZUR, Nazarii and CHUKHRAY, Nataliya. The impact of remote working on employee productivity in the modern world. Online. In: Boston, USA, 2023, s. 41-45. Available at: <https://doi.org/10.36074/logos-26.05.2023.010>. [cit. 2024-08-08].
9. MOTOWIDLO, J. Stephan and VAN SCOTTER, R. James, 1994. Evidence that task performance should be distinguished from contextual performance. Online. *Journal of Applied Psychology*. 79(4), 475 – 480. Available at: doi: 10.1037/0021-9010.79.4.475. [cit. 2024-08-08].
10. MOTOWIDLO, J. Stephan and KELL, J. Harrison. Job Performance. In: *Handbook of Psychology: Industrial and Organizational Psychology*, Vol. 12(2). 2013. S. 82-103.
11. MUSSIDA, Chiara and PATIMO, Raffaella, 2021. Women's Family Care Responsibilities, Employment and Health: A Tale of Two Countries. Online. *Journal of Family and Economic Issues*. 12.2020. 42, 489–507. Available at: <https://doi.org/10.1007/s10834-020-09742-4>. [cit. 2024-08-08].
12. ORHAN, A. Mehmet; RIJSMAN, B. John and VAN DIJK, M. Gerda, 2016. Invisible, therefore isolated: Comparative effects of
13. PIERCE, L. Jon and NEWSTROM, W. John, 1983. The design of flexible work schedules and employee responses: Relationships and process. Online. *Journal of Occupational Behavior*. 10. 4(4), 247–262. Available at: <https://www.jstor.org/stable/3000314>. [cit. 2024-08-08].
14. REBOLLEDO, A. Oscar; VEGA, C. Daniel and BELMAR, S. Ronaldo, 2021. Learning to Work While Homebound–The Effects of Remote Work on Job Performance during the Covid-19 Pandemic. Online. *JeFMS*. 4.6. 772-793. Available at: <https://ijefm.co.in/v4i6/Doc/13.pdf>. [cit. 2024-08-08].
15. TOSCANO, Ferdinand and ZAPALÁ, Salvatore, 2021. Overall job performance, remote work engagement, living with children, and remote work productivity during the COVID-19 pandemic. Online. *European Journal of Psychology Open*. Available at: <https://doi.org/10.1024/2673-8627/a000015>. [cit. 2024-08-08].
16. ZACKERY, Ali et al. 2022. COVID-19 Research in Business and Management: A Review and Future Research Agenda. Online. *Sustainability*, 14(16), 9820. Available at: <https://doi.org/10.3390/su14169820>. [cit. 2024-08-08].