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Online productivity and types of assignments in a Japanese workplace

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Online productivity and types of assignments in a Japanese workplace

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Abstract

With the advance of the COVID-19 pandemic, many companies in the world have embraced telework. Despite the large volume of related studies, telework has not been well documented in relation to work formats and assignments. We pose an open question of how productivity in an online or telework environment (i.e., online productivity) depends on work formats (individual vs. group) and types of assignments (routine vs. creative), hypothesizing that online productivity is low as compared to face-to-face productivity for creative tasks in a group format. We conducted the stratified questionnaire survey with 500 Japanese employees, collecting the data of their perceived online productivity for carrying out simple and creative tasks in individual and group formats as compared to face-to-face productivity. The three main findings are obtained. First, online productivity tends to be low for a group format as compared to an individual format. Second, in a group format, online productivity is higher for routine than for creative tasks. Third, online productivity is unconditionally exacerbated in organizations with a seniority-based wage system as compared to those with a performancebased one. Overall, our findings highlight a "telework dilemma" whereby online productivity is perceived to be low as compared to face-to-face one in a group format irrespective of the types of assignments, while a majority of people are willing to continue telework. To resolve it, some new measures or approaches shall be necessary to digitally enhance group operations in an online environment.

Key Words: Human resource management; Employee attitudes; Organizational culture; Institutions

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Nomenclature

CGP creative group productivity

- CIP creative individual productivity
- **D-PPOE** perceived productivity difference between routine and creative tasks in an online environment as compared to an office environment
- HRM human resource management
- ICT Information and Communications Technology
- **PPOE** perceived productivity in an online environment as compared to an office environment
- RGP routine group productivity
- RIP routine individual productivity
- SMEs small and medium-sized enterprises
- WCT willingness to continue telework

1 **Introduction**

Against the background of the ongoing COVID-19 pandemic, our everyday lifestyles as well 2 as working conditions have undergone noticeable changes. Initially, the transition from a face-3 to-face to an online environment has been dictated by a need of social distancing and was mostly 4 perceived as a temporary concession. However, as entire sectors of economy have started to em-5 brace teleworking in the long run, management, employees as well as environmental advocates 6 and other stakeholders have realized the benefits associated with this format. The most obvious 7 ones include spared cost of transportation and office rent, better opportunities to spend time with 8 family as well as enhanced autonomy and flexibility regarding a workplace routine. At the same 9 time, the costs associated with telework include, among others, extended working hours in front 10 of PC, lack of direct communications as well as supervision challenges. Nowadays, upon ques-11 tioning net benefits of prolonged telework, numerous companies opt to return to a face-to-face 12 environment (Taskin and Bridoux, 2010, Greer and Payne, 2014). Given this state of affairs, cur-13 rent research empirically addresses the issue of online productivity in a workplace according to 14 the types of assignments. 15

There exists an overwhelming evidence about positive organizational outcomes that telework 16 embodies (Harker Martin and MacDonnell, 2012). Golden (2006), Mahler (2012) and Caillier 17 (2013) report that limited teleworking hours are associated with both high job satisfaction and 18 high productivity. Those who are allowed to telework also display above-average levels of or-19 ganizational commitment (Mahler, 2012). Positive effect of the transition is magnified for those 20 who used to spend long time commuting to their workplaces (Shabanpour et al., 2018, Lister and 21 Harnish, 2019). Despite taking longer time to carry out tasks in a remote format as compared 22 to a face-to-face format, 76 % of the U.K. employees report improved work effectiveness, which 23 is mostly due to the absence of office distractions (Baruch, 2000). Telework can also enhance 24 inter-employee communication, provided the sound ICT (Information and Communications Tech-25 nology) environment and clearly defined performance benchmarks (Bailey and Kurland, 2002, 26 Illegems and Verbeke, 2004, Bosua et al., 2013). 27

On the other hand, due to the COVID-19 pandemic, many employees have been conducting their work in a solely online environment over a long period of time. After an initial improvement

of a work-life balance, the situation subsequently deteriorated due to the following factors. First, 30 proximity to a family as a result of working from home has often blurred the lines between job 31 responsibilities and domestic chores (Baruch, 2000, Golden et al., 2006). Second, whereas occa-32 sional teleworking can ease the burden of formal office communication, an entirely online environ-33 ment with unclear time horizons may lead to psychological isolation, deterioration of trust among 34 employees and a loss of organizational commitment (Gajendran and Harrison, 2007, Pyöriä, 2011, 35 Galanti et al., 2021). While for sectors such as real estate, financial intermediation and education it 36 has been natural to widen the scope of remote activities (Welz and Wolf, 2010), for manufacturing 37 industries such transition appears problematic (Dingel and Neiman, 2020, Etheridge et al., 2020, 38 Okubo, 2020). Other associated problems include (i) a lack of proper employee monitoring (Greer 39 and Payne, 2014), (ii) unrealized collaboration possibilities, and (iii) security concerns over data 40 transmission (Ruth and Chaudhry, 2008). All in all, management remains skeptical regarding the 41 net benefits of telework. 42

Recognizing the variety of challenges as well as opportunities that implementation of telework 43 presents for employees and their companies, existing scholarship mostly focuses on online indi-44 vidual productivity, while not sufficiently highlighting the issue of online group productivity. We 45 claim that the major challenge brought by the spread of telework is an impeded intra-employee 46 communication, especially when working on creative tasks. Addressing this literature gap, we 47 pose the following research question: how did "perceived productivity in an online environment 48 as compared to an office environment" (henceforth "PPOE") change depending on work formats 49 (individual vs. group) and types of assignments (routine vs. creative)? Let the PPOE difference 50 between routine and creative tasks be "D-PPOE." To this end, we test the following hypotheses by 51 analyzing the results of a stratified survey: (0) PPOE tends to be high for individual as compared 52 to group tasks, (1) individual D-PPOE is not significantly different from zero, (2) D-PPOE is pos-53 itive for group tasks. The paper proceeds as follows. Section 2 discusses the posed hypotheses, 54 section 3 presents statistical results and section 4 concludes with their implications. 55

⁵⁶ 2 Working environment and productivity

While all organizational processes involve interpersonal coordination, some assignments are 57 performed by workers autonomously. Due to their relative independence from a working environ-58 ment, individual assignments are to some extent self-guarded against external shocks. Whereas 59 telework itself can be viewed as an attribute of HRM (human resource management) individualiza-60 tion (Taskin and Devos, 2005), group tasks require stable supportive conditions that are difficult to 61 achieve in an online format (Allen et al., 2015). Despite the known difficulties related to carrying 62 out group assignments in an online environment, not many studies have operationalized team-63 work¹ challenges statistically (Lisbona et al., 2020, van der Lippe and Lippényi, 2020), not least 64 due to the measurement challenges (Salas et al., 2008). Exceeding a mere collective of co-workers, 65 main features of a corporate team are (1) being a social entity, (2) being interdependent and (3) 66 having a shared goal (Hackman, 2012, Salas et al., 2015). Therefore, high efficiency of individual 67 employees does not automatically make them productive members of a team (Salas et al., 2008, 68 Okubo, 2020, Umishio et al., 2022). In fact, the very concept of a "team" has transformed, with 69 "virtual teams" becoming increasingly prevalent (Hackman, 2012, de Leede and Nijland, 2016). 70 Although virtual teams enjoy benefits of asynchronicity, flexible schedules and enhanced mul-71 timedia tools (Garro-Abarca et al., 2021), task complexity necessitates the creation of a virtual 72 environment closely replicating an in-person format (Mak and Kozlowski, 2019). Provided that a 73 transition from an office to an online format happens abruptly, e.g. due to external shocks such as 74 the COVID-19 pandemic, we expect group PPOE to deteriorate compared to individual PPOE. 75

Hypothesis 0 PPOE is higher for individual tasks than for group tasks irrespective of whether
the assignment is routine or creative.

Job assignments can also be classified into routine and creative. While routine tasks are based on systematized prescriptions, creative tasks imply non-standard ways of thinking and performance. According to the common definition of a workplace creativity, it is about the production of useful and novel ideas or solutions to challenging problems (Amabile et al., 1996). Employee creativity can range between incremental improvements and introducing radically new concepts individually and as a group (Zhou and Shalley, 2011). There exist different views on whether or

¹Following Cohen and Bailey (1997), we use the terms "teamwork" and "group work" interchangeably.

not teleworking is beneficial for carrying out creative tasks. On one hand, online environment 84 enables well-organized employees to gear their schedules to individual needs. Absence of com-85 muting combined with casual working atmosphere are likely to help workers feel less reserved in 86 carrying out their creative pursuits remotely. Based on the laboratory experiment, Dutcher (2012) 87 finds that while a face-to-face format is beneficial for routine tasks, telework is associated with 88 high creative performance.² Martínez-Sánchez et al. (2007) and Umishio et al. (2022) also come 89 up with the evidence of an online environment being suitable for carrying out creative tasks. On 90 the other hand, Vega et al. (2015) and Mercier et al. (2021) argue that amid an overall creativity 91 enhancement in an online environment, creative performance lags behind routine performance. 92 Finally, one of the pioneering studies on telecommuting conducted by DuBrin (1991) argues that 93 telework is better geared for structured and repetitive than for creative tasks. Considering these 94 two opposite views on individual PPOE, we postulate the following hypothesis. 95

Hypothesis 1 For individual tasks, the difference between routine and creative PPOE is not sig nificantly different from zero.

Intra-employee knowledge sharing is inseparable from a shop-floor environment (Kozlowski 98 and Klein, 2000, Salas et al., 2015). Conceptually, shop-floor interactions are known as mani-99 festations of tacit knowledge (Nonaka, 2007). The latter is about innate or acquired abilities our 100 body and psychology possess (e.g. swimming or bicycle-riding) without being able to analyti-101 cally describe the underlying mechanism (Polanyi, 1966). Tacit knowledge is key for maintaining 102 group cohesiveness which, in turn, facilitates organizational productivity (Cohen and Bailey, 1997, 103 Hodzic et al., 2024). Its opposition - explicit knowledge - is a set of codified rules and pre-104 scriptions that function independently of an institutional context. Since tacit knowledge is more 105 difficult to imitate than explicit, its quality and transferability are likely to deteriorate online (Khal-106 ifa and Davison, 2000, Overmyer, 2011, Allen et al., 2015). While co-location and co-presence are 107 key to tacit knowledge sharing (Roberts, 2000), online teams tend to rely on explicit knowledge 108 (van der Meulen et al., 2019),³ often taking advantage of spatial separation by prioritizing such 109

²The author implemented experimental design not least because of the fact that, until recently, employees were endogenously assigned to telecommute based on their credibility and superior performance. In contrast, the COVID-19 pandemic has prompted non-discriminatory telework transition, enabling researchers to capture differences in productivity as compared to office format.

³According to Polanyi (1966), even when explicit knowledge is contextually predominant, it is still rooted in tacit knowledge.

arm's-length media as emails over video-conferencing (Leonardi et al., 2010). On one hand, there 110 exists a limited evidence of positive association between digital knowledge sharing and teams' cre-111 ative performance during the COVID-19 pandemic (Tønnessen et al., 2021). On the other hand, in 112 their experimental study, Brucks and Levav (2022) argue that staying focused on virtual meetings 113 suppresses the freedom required for producing creative output. Whereas codified operations are 114 relatively straightforward and easy-to-carry for virtual teams, heterogeneous online groups must 115 be proficient in upholding rapport, participating equally and managing conflicts to successfully 116 complete creative assignments (Martins and Shalley, 2011). Identifying the challenges pertain-117 ing to virtual teams' creativity, Han et al. (2017), van der Meulen et al. (2019) and Waizenegger 118 et al. (2020) also conclude that most of them are related to maintaining smooth communication 119 with other colleagues. In a nutshell, although multimedia tools come in handy for bridging the 120 gap between face-to-face and remote exchanges, there seems to be no perfect substitution for the 121 former. 122

123 **Hypothesis 2** For group tasks, the difference between routine and creative PPOE is positive.

Based on the above information, our hypothesis-testing is organized as follows. First, by comparing an individual and a group working formats, we inquire about their overall merits and demerits for PPOE. Next, we conduct the comparative analysis for each of those formats (individual and group) by examining the respective differences between routine and creative productivity, which we denote as D-PPOE. Estimating individual- and group-D-PPOE enables us to identify the work formats and types of assignments that are compatible either with face-to-face or with online working environments.

131 3 Results

Our data set was sourced from the registered participants' pool of a web-based questionnaire survey conducted by the Japan-based research organization Cross Marketing Inc in December 2020. During that time, the memories of the emergency lockdown caused by the spread of the COVID-19 virus were still vivid, as the state of emergency in 19 out of 47 prefectures had only been lifted in early October of the same year. Furthermore, numerous employees had kept working

remotely, and the prospects of returning to office were unclear.⁴ In fact, all our survey subjects 137 experienced both face-to-face and online working conditions. Our sample consists of 500 par-138 ticipants, which is partly determined by the budget and time constraints we face. Among the 139 respondents of the survey 200 are females and 300 - males. While 44 % of male subjects are 140 ordinary employees and 56% are managers, the respective distribution for females is 78% vs. 141 22%. This inter-gender discrepancy partially reflects the real population phenomenon, whereby 142 a relatively small share of women occupy advanced corporate posts. Half of the respondents are 143 employed in SMEs (small and medium-sized enterprises) of "300~1000" workers, and another 144 half is equally divided between firms of "1000~4999" and "5000 or more" workers. While the 145 survey subjects belong to different employment types ranging from regular (53 %) to dispatch 146 workers (14%), all of them have full-time contracts. Besides the questions about demographic-147 and lifestyle-characteristics, our survey concentrates on the work satisfaction and productivity, 148 focusing on the perceptional differences between pre-pandemic era and COVID-19 period. 149

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[Table 1 about here.]

As seen from table 1 that includes summary statistics, most of the variables are ordered factors 151 taking integer values between "1" (negative extreme) and "5" (positive extreme). This corresponds 152 to the 5-point Likert scale of subjective perceptions related to online working environment. For 153 example, possible responses to the questions about the change in productivity upon the transition 154 to an online environment range from "productivity has significantly decreased" (= 1) to "pro-155 ductivity has significantly increased" (= 5). The numeric variables include "Age," "Pre-COVID 156 income," "Pre-COVID sleeping hours," "Pre-COVID working hours" and "Pre-COVID commut-157 ing hours." Respondents' age distribution is displayed in figure 1. According to it, the mode value 158 is 61 years old and the median value is 50.5 years old. This picture resembles the real working 159 population tendencies, whereby, as of 2020, most of the country's workforce belonged to the age 160 category of "45-54" years old, accounting for 16.26 % of Japan's population (e-Stat, 2020). There 161 are some notable links between our variables, as presented in table 2. Among others, it shows 162 high correlation (r = 0.7) between overall online- and RIP (routine individual productivity). As 163 expected, comfort of online environment is highly correlated with the willingness to continue 164

⁴At the same time, teleworking ratio among Japanese employees due to the COVID-19 outbreak was the lowest among the OECD states, standing at about 30% as of July 2020 (Mori, 2021).

telework (WCT) in the aftermath of the pandemic (r = 0.67) and with being more productive 165 when working remotely (r = 0.53). In addition, we can observe significant positive correlations 166 between different domains of telework. Along with demographic variables as well as the mea-167 surements of online productivity and satisfaction, we also inquire about the type of remuneration 168 system. We include this metric as an exogenous way to quantify explicit and tacit types of knowl-169 edge.⁵ Since it is impossible to directly operationalize them, we suggest "seniority-based pay" as 170 a proxy for capturing tacit knowledge and "performance-based pay" – as a proxy for capturing 171 explicit knowledge. 172

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[Figure 1 about here.]

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[Table 2 about here.]

[Figure 2 about here.]

According to the results of the exploratory analysis, general perception of telework can be de-176 scribed as follows. As figure 2(a) demonstrates, both men and women clearly find it comfortable 177 to work remotely. In agreement with this, figure 2(b) shows a strong positive trend in the will-178 ingness to continue telework ("WCT" henceforth) even if the COVID-19 restrictions are lifted. 179 The WCT is particularly high among females, 34% of whom chose the most affirmative answer. 180 The respective figure of 24.7% for males is also high. Moreover, additional 24.5% of females 181 and 31.3 % of males express their WCT as "positive." Similar tendencies are observed when dis-182 aggregating the sample into ordinary and managerial ranks. In the context of the overall-positive 183 assessement of remote work, it is interesting that subjective perception of labor productivity is 184 rather mixed, as figure 2(c) shows. In case of women, it can be described as "ambivalent," with 185 27% of female respondents holding an opinion that productivity in an online environment has 186 decreased, and 30.5% thinking the opposite. Regarding men, the perception is negative, with 187 30.6% of male respondents being critical regarding online productivity, and only 20.6% holding 188 a positive opinion. All in all, it can be said that despite enjoying working remotely, most of the 189 respondents report decreased online productivity. 190

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[Figure 3 about here.]

⁵Other studies like the one by Hodzic et al. (2024) use self-reported measurement of knowledge sharing.

Next, we analyze productivity levels pertaining to different types of assignments in an online 192 environment as formulated in hypotheses 0, 1 and 2. In the context of hypothesis 0, as seen from 193 table 1 and figure 3, average individual PPOE is higher than average group PPOE, irrespectively 194 of the type of assignment. In order to verify that these differences are also statistically consistent 195 across the analyzed subjects, we run the Wilcoxon signed-rank test designed for a non-parametric 196 paired comparison of measurements taken from the same subjects. The null-hypothesis of the 197 one-tailed Wilcoxon test states that individual PPOE is less or equal to group PPOE. The results 198 show that the null hypothesis of the Wilcoxon signed-rank test is rejected at 1% level both for the 199 comparisons between routine (RIP vs. RGP) and creative (CIP vs. CGP) assignments. In other 200 words, individual PPOE is greater than group PPOE irrespective of the type of task, hence the 201 hypothesis 0 is confirmed. On the subject of hypothesis 1, we run the two-tailed Wilcoxon signed-202 rank test with the following null-hypothesis: individual D-PPOE is not significantly different from 203 zero. As the null-hypothesis cannot be rejected (p > 0.1), hypothesis 1 is confirmed. Moving on to 204 hypothesis 2, in order to verify, whether the positive mean value for group D-PPOE inferred from 205 table 1 is statistically significant, we run one-tailed Wilcoxon signed-rank test with the following 206 null-hypothesis: group D-PPOE is less or equal to zero. The results of the test show that the null 207 hypothesis is rejected at 5% level, meaning that group D-PPOE is statistically greater than zero. 208 Based on this, hypothesis 2 is confirmed. 209

The obtained results invite further inquiry about the factors responsible for positive group D-210 PPOE as well as for individual D-PPOE being not significantly different from zero. Based on this, 211 we run linear regressions with group and individual D-PPOE as dependent variables respectively, 212 presenting the results in table 5 from appendix A. According to it, only few predictors are suited 213 to explain the D-PPOE. Namely, an additional pre-COVID commuting hour corresponds to 0.21-214 point increase in individual PPOE when holding other independent variables constant. In addition, 215 when controlling for other covariates, females register 0.17-point higher individual D-PPOE than 216 males. Finally, respondents with high pre-COVID income levels also tend to display high group 217 D-PPOE. Overall, the independent variables at our disposal are clearly not enough to adequately 218 interpret the variance within D-PPOE. 219

Based on this, we run additional confirmatory regressions for each PPOE separately, reporting the results in table 3. First, as expected, employees that experienced few sleeping hours prior

to the pandemic display high levels of individual PPOE. Second, our most interesting finding is 222 that, irrespective of the assignment type, employees under a "seniority-merit" wage system display 223 consistently lower levels (more than 0.2 points on the 5-point Likert scale) of PPOE compared to 224 the "performance-based" wage system. While performance-based pay rests on quantifiable short-225 term benchmarks, criteria for evaluating recipients of seniority-based wages are more difficult to 226 appraise. On top of wage hikes that correspond to a tenure within a company, seniority-based 227 pay comes with sustainable intensives such as job security and social reputation (Lazear, 2000, 228 Bayo-Moriones et al., 2010, Cadsby et al., 2017). Rather than executing a specified range of 229 prescribed tasks, recipients of seniority wages gain experience in different departments during 230 a prolonged period of time, which allows them to accumulate and internally disseminate firm-231 specific expertise. We assume that those organizations/departments that adopt seniority-based pay 232 are the ones that give importance to tacit knowledge. While recipients of seniority wages are key 233 to maintaining firm's comparative advantage, it is problematic to transplant their office-specific 234 skills to an online environment. On the other hand, performance- or competency-based pay is 235 rooted in codified environment-agnostic criteria, providing effective incentives for workers to stay 236 productive under remote working conditions (Cira and Benjamin, 1998, Hon, 2012). 237

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[Table 3 about here.]

As described above, despite reporting lower PPOE, respondents nevertheless display high WCT. Table 4 provides insights into the factors associated with WCT regardless of the pandemicrelated restrictions. First, along with our expectations, WCT is pronounced among females and young people. Second, as we anticipated, employees who enjoyed less sleeping hours before the COVID-19 pandemic tend to report high levels of WCT. Third, high WCT is pronounced among respondents with relatively high educational degrees and income levels.

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[Table 4 about here.]

As telework is associated with deterioration of inter-employee communications, this naturally leads to difficulties for performing group tasks, as argued in the hypothesis 0. At the same time, our analysis does not show significantly positive or negative individual D-PPOE, as postulated in

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the hypothesis 1. This reverberates the mixed evidence, according to which, online working envi-249 ronment may either boost or impede individual creativity depending on a set of personal and cor-250 porate characteristics (Liu et al., 2021). Provided the challenges for virtual teams, we find that the 251 detrimental effect of transition to telework is positively mediated for groups who perform routine 252 tasks. When doing so, teams are less dependent upon communication-related hurdles, resulting in 253 positive group D-PPOE, as postulated in hypothesis 2. Since only few predictors at our disposal 254 were able to explain the variance in D-PPOE, we ran four individual regressions corresponding to 255 each PPOE type. Among the most prominent factors behind each PPOE domain is *seniority-merit* 256 wage system that proxies tacit knowledge prevalence. As our results show, upon the transition to 257 an online environment, employees embedded in environments proliferating tacit knowledge expe-258 rience greater drop in productivity compared to those mainly operating with explicit knowledge. 259 For corporations that prioritize idiosyncratic capital accumulation, tacit knowledge is a shop-floor 260 "glue" connecting team members, whose organizational commitment is loosely linked to explicit 261 criteria, and is rather embedded in a long-term employee-firm nexus based on loyalty and trust. 262 This cohort of workers habitually prove their value through a series of shop-floor interactions – 263 beyond the scope of prescribed duties. Naturally, such tacit ecosystem is likely to crumble once 264 its nodes become physically disconnected. 265

Despite the decline in PPOE across all domains, transition to an online working environment 266 has been welcomed by most of the employees, translating into high WCT. Following factors are 26 important in this regard. First (i), WCT is pronounced among females, which can be explained 268 by their high involvement in domestic chores and childcare. Second (ii), respondents with high 269 educational degrees and income also display high WCT, which might be due to their hitherto high 270 pre-COVID telecommuting frequency (Noonan and Glass, 2012) that safeguarded them from po-27 tentially stressful experiences upon the mandatory telework transition post-2019. Finally, workers 272 who had few sleeping hours prior to the pandemic show high levels of both WCT and individual 273 PPOE. We identify the discrepancy between high WCT and low PPOE as a "telework dilemma." 274 On one hand, our results speak to the importance of maintaining employees' physical and mental 275 health for enhancing their job satisfaction (Lister and Harnish, 2019). Granting the legacy of long 276 working hours in countries like Japan (Mizunoya, 2002), at least a partial transition to an online 277 environment provides a favorable ground for tailoring an optimal work-life balance (Bosua et al., 278

279 2013). On the other hand, our results demonstrate clear challenges associated with carrying out 280 group tasks remotely. Both the ubiquitous decrease in PPOE among recipients of seniority-merit 281 wages and the decline in group PPOE vis-à-vis individual PPOE point at the essential role of de-282 signing alternative ways of online knowledge circulation (Cabrera and Cabrera, 2005, Taskin and 283 Bridoux, 2010, Aksnes et al., 2023), which includes advance implementation of digital technolo-284 gies (Greer and Payne, 2014, Yoshino and Hendriyetty, 2020).

285 4 Conclusion

In this paper, we pose the question of how perceived productivity in an online environment 286 (PPOE) changed depending on work formats and types of assignments. Accordingly, our hy-28 potheses deal with the differences in PPOE between an individual and a group format overall, as 288 well as with differences between routine and creative tasks (which we refer to as "D-PPOE") for 289 each of these formats. By running non-parametric Wilcoxon signed-rank test, we obtain the fol-290 lowing findings. First, PPOE is higher for individual than for group tasks. Next, we establish that 291 individual D-PPOE is not significantly different from zero. Finally, we find that D-PPOE is posi-292 tive for group tasks. These results have the following implications. Group tasks, especially those 293 that involve creative thinking, can be carried out effectively in a familiar environment that facil-294 itates unmediated communication. Due to COVID-19-inflicted transition to telework, customary 295 inter-employee interactions were disrupted, leading to decreased group PPOE. At the same time, 296 employees were able to maintain decent levels of individual PPOE that appears equally resilient 297 for routine and creative assignments. Beyond the scope of our hypotheses, we discovered that 298 PPOE unequivocally drops among the recipients of seniority-merit wages. We associate the lat-299 ter with the prevalence of tacit knowledge and argue that its proliferation is highly problematic 300 in an online environment. Notably, despite displaying low levels of PPOE, respondents express 301 their willingness to continue teleworking (WCT), which leads to a so-called "telework dilemma." 302 It invites the development of a mixed-format working system, whereby employee productivity is 303 enhanced via improved personal well-being. 304

³⁰⁵ Finally, we note the limitations of the current study and the prospects for future research. ³⁰⁶ Subjective self-assessment of online productivity that we use would be more credible, had it been

combined with evaluation from corporate superiors. Furthermore, as our paper identified the prob-307 lem of carrying out group tasks in an online environment, it would be logical to include the vari-308 ables related to horizontal (between employees of a same rank) and vertical (between managers 309 and ordinary employees) communication quality. This would align the prospective study with 310 the recommendation by Salas et al. (2008) to use context-specific measurements of team perfor-311 mance. On top of this, while distinguishing between the types of online assignments, our paper 312 would benefit from additionally covering industrial differences as well as degrees of corporate 313 digitalization. 314

References

- Aksnes, S., Underthun, A., and Hansen, P. (2023). Constructing new organizational identities in a post-pandemic return: Managerial dilemmas in balancing the spatial redesign of telework with workplace dynamics and the external imperative for flexibility. In Bergum, S., Peters, P., and Vold, T., editors, *Virtual Management and the New Normal: New Perspectives on HRM and Leadership since the COVID-19 Pandemic*, pages 59–78. Springer International Publishing, Cham.
- Allen, T., Golden, T., and Shockley, K. (2015). How effective is telecommuting? Assessing the status of our scientific findings. *Psychological science in the public interest*, 16:40–68.
- Amabile, T. M., Amabile, T. M., Collins, M. A., Conti, R., Phillips, E., Picariello, M., Ruscio, J., and Whitney, D. (1996). The meaning and measurement of creativity. In *Creativity in Context*, pages 19–40. Routledge.
- Bailey, D. and Kurland, N. (2002). A review of telework research: Findings, new directions, and lessons for the study of modern work. *Journal of organizational behavior*, 23:383–400.
- Baruch, Y. (2000). Teleworking: Benefits and pitfalls as perceived by professionals and managers. *New technology, work and employment*, 15:34–49.
- Bayo-Moriones, A., Galdon-Sanchez, J., and Güell, M. (2010). Is seniority-based pay used as a motivational device? Evidence from plant-level data. In W. Polachek, S. and Tatsiramos, K., editors, *Jobs, Training, and Worker Well-being*, volume 30 of *Research in Labor Economics*, pages 155–187. Emerald Group Publishing Limited.
- Bosua, R., Gloet, M., Kurnia, S., Mendoza, A., and Yong, J. (2013). Telework, productivity and wellbeing: An Australian perspective. *Telecommunications journal of Australia*, 63:11.1–11.12.
- Brucks, M. S. and Levav, J. (2022). Virtual communication curbs creative idea generation. *Nature*, 605:108–112.
- Cabrera, E. F. and Cabrera, A. (2005). Fostering knowledge sharing through people management practices. *International journal of human resource management*, 16:720–735.
- Cadsby, B., Song, F., and Tapon, F. (2017). Sorting and incentive effects of pay for performance: An experimental investigation. *Academy of management journal*, 50:387–405.
- Caillier, J. (2013). Satisfaction with work-life benefits and organizational commitment / job involvement: Is there a connection? *Review of public personnel administration*, 33:340–364.
- Cira, D. and Benjamin, E. (1998). Competency-based pay: A concept in evolution. *Compensation and benefits review*, 30:21–28.
- Cohen, S. G. and Bailey, D. E. (1997). What makes teams work: Group effectiveness research from the shop floor to the executive suite. *Journal of management*, 23:239–290.
- de Leede, J. and Nijland, J. (2016). Understanding teamwork behaviors in the use of new ways of working. In *New Ways of Working Practices*, volume 16 of *Advanced Series in Management*, pages 73–94. Emerald Group Publishing Limited.
- Dingel, J. and Neiman, B. (2020). How many jobs can be done at home? *Journal of public economics*, 189:104235.

- DuBrin, A. (1991). Comparison of the job satisfaction and productivity of telecommuters versus in-house employees: A research note on work in progress. *Psychological reports*, 68:1223–1234.
- Dutcher, G. (2012). The effects of telecommuting on productivity: An experimental examination. The role of dull and creative tasks. *Journal of economic behavior and organization*, 84:355–363.
- e-Stat (2020). Population census. Technical report, Statistics Bureau of Japan.
- Etheridge, B., Wang, Y., and Tang, L. (2020). Worker productivity during lockdown and working from home: Evidence from self-reports. Working Paper 2020-12, ISER Working Paper Series.
- Gajendran, R. and Harrison, D. (2007). The good, the bad, and the unknown about telecommuting: Meta-analysis of psychological mediators and individual consequences. *Journal of applied psychology*, 92:1524–1541.
- Galanti, T., Guidetti, G., Mazzei, E., Zappalà, S., and Toscano, F. (2021). Work from home during the COVID-19 outbreak. *Journal of occupational and environmental medicine*, 63:426–432.
- Garro-Abarca, V., Palos-Sanchez, P., and Aguayo-Camacho, M. (2021). Virtual teams in times of pandemic: Factors that influence performance. *Frontiers in Psychology*, 12.
- Golden, T. (2006). Avoiding depletion in virtual work: Telework and the intervening impact of work exhaustion on commitment and turnover intentions. *Journal of vocational behavior*, 69:176–187.
- Golden, T., Veiga, J., and Simsek, Z. (2006). Telecommuting's differential impact on work-family conflict: Is there no place like home? *Journal of applied psychology*, 91:1340–1350.
- Greer, T. and Payne, S. (2014). Overcoming telework challenges: Outcomes of successful telework strategies. *Psychologist-manager journal*, 17:87–111.
- Hackman, J. R. (2012). From causes to conditions in group research. *Journal of organizational behavior*, 33:428–444.
- Han, S. J., Chae, C., Macko, P., Park, W., and Beyerlein, M. (2017). How virtual team leaders cope with creativity challenges. *European journal of training and development*, 41:261–276.
- Harker Martin, B. and MacDonnell, R. (2012). Is telework effective for organizations? A metaanalysis of empirical research on perceptions of telework and organizational outcomes. *Management research review*, 35:602–616.
- Hodzic, S., Prem, R., Nielson, C., and Kubicek, B. (2024). When telework is a burden rather than a perk: The roles of knowledge sharing and supervisor social support in mitigating adverse effects of telework during the COVID-19 pandemic. *Applied psychology*, 73:599–621.
- Hon, A. (2012). When competency-based pay relates to creative performance: The moderating role of employee psychological need. *International journal of hospitality management*, 31:130–138.
- Illegems, V. and Verbeke, A. (2004). Telework: What does it mean for management? *Long range planning*, 37:319–334.

- Khalifa, M. and Davison, R. (2000). Viewpoint: Exploring the telecommuting paradox. *Communications of the ACM*, 43:29–31.
- Kozlowski, S. W. J. and Klein, K. J. (2000). A multilevel approach to theory and research in organizations: Contextual, temporal, and emergent processes. In *Multilevel Theory, Research, and Methods in Organizations: Foundations, Extensions, and New Directions*, pages 3–90. Jossey-Bass/Wiley, Hoboken, NJ, US.
- Lazear, E. (2000). Performance pay and productivity. American economic review, 90:1346–1361.
- Leonardi, P. M., Treem, J. W., and Jackson, M. H. (2010). The connectivity paradox: Using technology to both decrease and increase perceptions of distance in distributed work arrangements. *Journal of applied communication research*, 38:85–105.
- Lisbona, A., Las-Hayas, A., Palací, F., Bernabé, M., Morales, F., and Haslam, A. (2020). Team efficiency in organizations: A group perspective on initiative. *International journal of environmental research and public health*, 17:1926.
- Lister, K. and Harnish, T. (2019). Telework and its effects in the United States. In Messenger, J., editor, *Telework in the 21st Century*, chapter 3, pages 128–170. Edward Elgar Publishing.
- Liu, L., Wan, W., and Fan, Q. (2021). How and when telework improves job performance during COVID-19? Job crafting as mediator and performance goal orientation as moderator. *Psychology research and behavior management*, 14:2181–2195.
- Mahler, J. (2012). The telework divide: Managerial and personnel challenges of telework. *Review* of public personnel administration, 32:407–418.
- Mak, S. and Kozlowski, S. W. J. (2019). Virtual teams: Conceptualization, integrative review, and research recommendations. In Landers, R. N., editor, *The Cambridge Handbook of Technology* and Employee Behavior, Cambridge Handbooks in Psychology, pages 441–479. Cambridge University Press, Cambridge.
- Martínez-Sánchez, A., Pérez-Pérez, M., De-Luis-Carnicer, P., and Vela-Jiménez, M. (2007). Telework, human resource flexibility and firm performance. *New technology, work and employment*, 22:208–223.
- Martins, L. L. and Shalley, C. E. (2011). Creativity in virtual work: Effects of demographic differences. *Small group research*, 42:536–561.
- Mercier, M., Vinchon, F., Pichot, N., Bonetto, E., Bonnardel, N., Girandola, F., and Lubart, T. (2021). COVID-19: A boon or a bane for creativity? *Frontiers in psychology*, 11:601150.
- Mizunoya, T. (2002). An international comparison of unpaid overtime work among industrialized countries. Technical report, International Labour Organization.
- Mori, T. (2021). The coronavirus pandemic and the increase of teleworking in eight countries. Report, Nomura Research Institute.
- Nonaka, I. (2007). The knowledge-creating company. *Harvard business review*, July–August:162–171.
- Noonan, M. and Glass, J. (2012). The hard truth about telecommuting. *Monthly labor review*, 135:38.

- Okubo, T. (2020). Spread of COVID-19 and telework: Evidence from Japan. *Covid economics*, 32:1–25.
- Overmyer, S. (2011). Implementing telework: Lessons learned from four federal agencies. *IBM Center for The Business of Government*, Spring–Summer:99–102.
- Polanyi, M. (1966). The logic of tacit inference. *Philosophy*, 41:1–18.
- Pyöriä, P. (2011). Managing telework: Risks, fears and rules. *Management research review*, 34:386–399.
- Roberts, J. (2000). From know-how to show-how? Questioning the role of information and communication technologies in knowledge transfer. *Technology analysis & strategic management*, 12:429–443.
- Ruth, S. and Chaudhry, I. (2008). Telework: A productivity paradox? *IEEE Internet computing*, 12:87–90.
- Salas, E., Cooke, N., and Rosen, M. (2008). On teams, teamwork, and team performance: Discoveries and developments. *Human factors*, 50:540–547.
- Salas, E., Shuffler, M. L., Thayer, A. L., Bedwell, W. L., and Lazzara, E. H. (2015). Understanding and improving teamwork in organizations: A scientifically based practical guide. *Human resource management*, 54:599–622.
- Shabanpour, R., Golshani, N., Tayarani, M., Auld, J., and Mohammadian, A. (2018). Analysis of telecommuting behavior and impacts on travel demand and the environment. *Transportation research part D*, 62:563–576.
- Taskin, L. and Bridoux, F. (2010). Telework: A challenge to knowledge transfer in organizations. *International journal of human resource management*, 21:2503–2520.
- Taskin, L. and Devos, V. (2005). Paradoxes from the individualization of human resource management: The case of telework. *Journal of business ethics*, 62:13–24.
- Tønnessen, Ø., Dhir, A., and Flåten, B.-T. (2021). Digital knowledge sharing and creative performance: Work from home during the COVID-19 pandemic. *Technological forecasting and social change*, 170:120866.
- Umishio, W., Kagi, N., Asaoka, R., Hayashi, M., Sawachi, T., and Ueno, T. (2022). Work productivity in the office and at home during the COVID-19 pandemic: A cross-sectional analysis of office workers in Japan. *Indoor air*, 32:e12913.
- van der Lippe, T. and Lippényi, Z. (2020). Co-workers working from home and individual and team performance. *New technology, work and employment*, 35:60–79.
- van der Meulen, N., van Baalen, P., van Heck, E., and Mülder, S. (2019). No teleworker is an island: The impact of temporal and spatial separation along with media use on knowledge sharing networks. *Journal of information technology*, 34:243–262.
- Vega, R., Anderson, A., and Kaplan, S. (2015). A within-person examination of the effects of telework. *Journal of business and psychology*, 30:313–323.

- Waizenegger, L., McKenna, B., Cai, W., and Bendz, T. (2020). An affordance perspective of team collaboration and enforced working from home during COVID-19. *European journal of information systems*, 29:429–442.
- Welz, C. and Wolf, F. (2010). Telework in the European Union. In *European Foundation for the Improvement of Living and Working Conditions*, volume EF/09/96/EN, pages 1–28.
- Yoshino, N. and Hendriyetty, N. (2020). The COVID-19 crisis: Policy recommendations for Japan. *Economists' voice*, 17:20200017.
- Zhou, J. and Shalley, C. E. (2011). Deepening our understanding of creativity in the workplace: A review of different approaches to creativity research. In *APA Handbook of Industrial and Organizational Psychology, Vol 1: Building and Developing the Organization*, APA Handbooks in Psychology®, pages 275–302. American Psychological Association, Washington, DC, US.

A Supplementary tables

[Table 5 about here.]

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Figure 1: Age distribution



100%

80%

60%

40%

20%

%0

Figure 2: Subjective perceptions of telework



Figure 3: Perceived online productivity: variations across main domains ("1" — lowest score, "5" — highest score)

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Table 1: Descriptive statistics

	Definition	z	Mean	Median	Min	Мах	St Dev
Age	A variable that represents the age of a respondent.	500	48.462	50.5	23	69	11.965
Gender	A dummy variable that takes I if a respondent is male, otherwise 0.	500	1.4	1	1	7	0.490
FirmSize	A categorical variable that represents the size of a company.	500	2.546	2.5	1	4	1.076
Pre-COVID commuting hours	A variable that represents average daily commuting hours of a respondent before COVID-19 pandemic.	500	0.978	1	0	2.5	0.432
Education	A categorical variable that shows a respondent's educational level.	500	5.566	9	1	L	1.364
Pre-COVID income	A categorical variable that represents an annual salary of a respondent before COVID-19 pandemic.	500	4.148	4	1	9	1.090
	It ranges from "less than 1 million Japanese yen" (1) to "more than 10 million Japanese yen" (6).						
Pre-COVID working hours	A variable that represents average daily working hours before COVID-19 pandemic.	500	8.495	8	2	20	1.400
Pre-COVID sleeping hours	A variable that represents average daily sleeping hours before COVID-19 pandemic.	500	6.138	9	1	8	1.104
Well-being	A composite variable that assesses the degree of respondent's well-being.	500	3.834	4	1	7	1.243
RIP	A variable that represents respondent's routine individual productivity	500	2.922	3	1	5	0.970
	in an online environment.						
CIP	A variable that represents respondent's creative individual productivity	500	2.952	ю	1	5	0.907
	in an online environment.						
RGP	A variable that represents respondent's routine group productivity	500	2.732	3	1	5	0.877
	in an online environment.						
CGP	A variable that represents respondent's creative group productivity	500	2.664	ю	1	5	0.856
	in an online environment.						
TeleProductivity	A variable that represents respondent's overall productivity in an online environment.	500	2.942	ю	1	5	0.908
TeleComfort	A variable that represents the degree of respondent's comfort	500	3.408	ю	1	5	1.004
	associated with working in an online environment.						
WCT	A variable that represents the degree of respondent's willingness to continue	500	3.566	4	1	5	1.241
	teleworking upon the lifting of COVID-19-related restrictions.						

	1	2	3	4	5	9	L	8	6	10	11	12	13	14	15
1. Age															
2. Gender	0.11*														
3. FirmSize	0.02	-0.05													
4. Pre-COVID commuting hours	0.06	0.14^{**}	-0.05												
5. Education	-0.12**	0.26^{***}	-0.02	0.02											
6. Pre-COVID income	0.18^{***}	0.34^{***}	0.09*	0.03	0.23^{***}										
7. Pre-COVID working hours	-0.19***	0.14^{**}	0.02	0.05	0.19^{***}	0.21^{***}									
8. Pre-COVID sleeping hours	-0.11*	0.09	-0.03	-0.19^{***}	0.07	0.01	-0.17***								
9. RIP	-0.07	-0.07	-0.06	0.04	0.05	0.00	0.00	-0.09*							
10. CIP	-0.03	-0.01	0.00	-0.04	0.05	0.00	0.04	-0.10*	0.50^{***}						
11. RGP	-0.08	-0.02	0.06	-0.08	0.03	0.03	0.00	0.00	0.35^{***}	0.28^{***}					
12. CGP	-0.03	-0.01	0.04	-0.01	0.01	-0.03	0.00	-0.07	0.36^{***}	0.46^{***}	0.48^{***}				
13. Productivity	-0.10*	-0.08	-0.05	-0.05	0.05	0.02	0.02	-0.06	0.70^{***}	0.51^{***}	0.49^{***}	0.50^{***}			
14. TeleComfort	-0.07	0.02	0.03	-0.02	0.04	0.13^{**}	0.04	-0.05	0.52^{***}	0.38^{***}	0.29^{***}	0.29^{***}	0.53^{***}		
15. WCT	-0.17***	-0.05	0.07	0.06	0.13^{**}	0.12^{**}	0.12^{**}	-0.11*	0.49^{***}	0.37^{***}	0.26^{***}	0.28^{***}	0.53^{***}	0.67^{***}	
16. Well-being	0.07	0.03	0.05	-0.07	0.00	0.13^{**}	-0.08	0.14^{**}	0.00	0.04	-0.05	-0.02	0.07	0.17^{***}	0.02
M	***														

	matrix
	correlation
	Pearson
,	ä
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Note: $^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.01$; $^{*}p < 0.05$

	RIP	CIP	RGP	CGP
Wage system (base group = "Performace-based")				
Seniority-based	-0.25^{***}	-0.22^{***}	-0.23^{***}	-0.23^{***}
	(0.09)	(0.09)	(0.08)	(0.08)
Other	-0.15	-0.10	-0.17	-0.19
	(0.20)	(0.18)	(0.18)	(0.17)
Gender (base group = "Female")	-0.16	0.02	0.03	0.04
	(0.10)	(0.09)	(0.09)	(0.09)
Pre-COVID sleeping hours	-0.08^{*}	-0.10^{***}	-0.01	-0.05
	(0.04)	(0.04)	(0.04)	(0.04)
Education	0.05	0.05	0.01	0.01
	(0.03)	(0.03)	(0.03)	(0.03)
Employment rank (base group = "Managerial")				
Regular	0.08	0.00	0.17^{*}	0.12
	(0.10)	(0.10)	(0.09)	(0.09)
Marital status (<i>base group</i> = "Single")				
Married	-0.03	-0.11	-0.12	-0.02
	(0.10)	(0.09)	(0.09)	(0.09)
Well-being	0.02	0.06^{*}	-0.03	0.00
-	(0.04)	(0.03)	(0.03)	(0.03)
Age	-0.01	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Pre-COVID income	0.03	-0.01	0.07	-0.02
	(0.05)	(0.04)	(0.04)	(0.04)
Pre-COVID commuting hours	0.09	-0.12	-0.16^{*}	-0.05
	(0.10)	(0.10)	(0.09)	(0.09)
Intercept	3.30***	3.53***	2.97^{***}	3.15^{***}
	(0.46)	(0.43)	(0.42)	(0.41)
R ²	0.04	0.04	0.04	0.03
Adj. \mathbb{R}^2	0.02	0.02	0.02	0.01
Num. obs.	500	500	500	500

Table 3: PPOE regressions

Table 4:	WCT	regressions
	WC1	regressions

	Model 1	Model 2	Model 3
Wage system (base group = "Performace-based")			
Seniority-based	-0.13	-0.13	-0.17
	(0.11)	(0.11)	(0.11)
Other	-0.27	-0.27	-0.10
	(0.25)	(0.25)	(0.24)
Gender (base group = "Female")	-0.22^{*}	-0.22^{*}	-0.27^{**}
	(0.12)	(0.13)	(0.13)
Pre-COVID sleeping hours	-0.13^{**}	-0.13^{**}	-0.13^{***}
	(0.05)	(0.05)	(0.05)
Education	0.14^{***}	0.14^{***}	0.10^{**}
	(0.04)	(0.04)	(0.04)
Employment rank (base group = "Managerial")			
Regular		-0.00	0.09
		(0.12)	(0.13)
Marital status (<i>base group</i> = "Single")			
Married		-0.04	0.03
		(0.12)	(0.12)
Well-being		. ,	0.04
			(0.05)
Age			-0.02^{***}
			(0.00)
Pre-COVID income			0.19^{***}
			(0.06)
Pre-COVID commuting hours			0.16
			(0.13)
Intercept	3.75^{***}	3.77^{***}	3.92^{***}
	(0.38)	(0.40)	(0.57)
R^2	0.04	0.04	0.09
Adj. R ²	0.03	0.03	0.07
Num. obs.	500	500	500

***p < 0.01; **p < 0.05; *p < 0.1

m 11 m	D DDOD	•
Table 5.	D-PPOE	regressions
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	Individual D-PPOE	Group D-PPOE
Wage system (<i>base group</i> = " <i>Performace-based</i> ")		
Seniority-based	-0.03	0.00
	(0.09)	(0.08)
Other	-0.05	0.01
	(0.19)	(0.18)
Gender (base group = "Female")	-0.17^{*}	-0.01
	(0.10)	(0.09)
Pre-COVID sleeping hours	0.03	0.04
	(0.04)	(0.04)
Education	0.00	-0.00
	(0.03)	(0.03)
Employment rank (base group = "Managerial")		
Regular	0.07	0.05
	(0.10)	(0.09)
Marital status (<i>base group</i> = " <i>Single</i> ")		
Married	0.08	-0.10
	(0.10)	(0.09)
Well-being	-0.03	-0.03
	(0.04)	(0.03)
Age	-0.00	-0.00
	(0.00)	(0.00)
Pre-COVID income	0.04	0.08^{*}
	(0.05)	(0.04)
Pre-COVID commuting hours	0.21^{**}	-0.11
	(0.10)	(0.10)
Intercept	-0.23	-0.18
	(0.45)	(0.43)
\mathbb{R}^2	0.02	0.02
Adj. \mathbb{R}^2	-0.00	-0.00
Num. obs.	500	500

***p < 0.01; **p < 0.05; *p < 0.1