

‘Location, Location, Location’: An Exploration of Different Workplace Contexts in Remote Teamwork during the COVID-19 Pandemic

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Much emphasis has been placed on how the affordances and layouts of an office setting can influence co-worker interactions and perceived team outcomes. Little is known, however, whether perceptions of teamwork and team conflict are affected when the location of work changes from the office to the home. To address this gap, we present findings from a ten-week, *in situ* study of 91 information workers from 27 US-based teams. We compare three distinct work locations—private and shared workspaces at home as well as the office—and explore how each location may impact individual perceptions of teamwork. While there was no significant association with participants’ perceptions of teamwork, results revealed associations of work location with team conflict: participants who worked in a private room at home reported significantly lower team conflict compared to those working in the office. No difference was found for the office and the shared workspace. We further found that the influence of work location on team conflict interacted with job decision latitude and the level of task interdependence among co-workers. We discuss practical implications for full-time work from home (WFH) on teams. Our study adds an important environmental dimension to the literature on remote teaming, which in turn may help organizations as they consider, prepare, or implement more permanent WFH and/or hybrid work policies in the future.

CCS Concepts: • **Human-centered computing** → **Computer supported cooperative work**; **Empirical studies in collaborative and social computing**.

Additional Key Words and Phrases: work-from-home, remote teams, remote work, teamwork, job autonomy, productivity, conflict, cohesion, communication, climate, coordination, COVID-19, well-being, home office, telecommuting, *in situ* study

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1 INTRODUCTION

The world is in the midst of the most significant change to the organization of work in a generation [93]. The home has become a viable workplace alternative for many information workers and their teams [55, 94]. A recent Pew Research report showed that roughly six-in-ten U.S. workers (59%) work from home all or most of the time [73]. Many organizations have moved to hiring more full-time remote workers while others have taken steps to implement hybrid team-working models in various ways [60]. Yet other highly influential voices are again starting to mandate workers to return to the office full-time. Tesla CEO Elon Musk prominently announced in mid-2022 that employees would need to spent at least 40 hours per week in the office or face being fired [38], reasoning that Tesla could only develop innovative and industry-leading products if employees are collocated [24].

Despite such diverse attitudes, it remains an open question as to how exactly work location affects remote teamwork and team interactions. Moreover, it is not clear whether there are differences if the primary workplace is set up either in a private room (existing home offices, guest rooms, private bedrooms, etc.) or in a shared room (kitchen, living room, etc.). Perceptions of teamwork may be associated with physical location—whether people have to set up their workspace in shared, more traffic-ridden environments or have access to a private room, which may aid in properly maintaining healthy work/life boundaries. Then again, it may be that the office location is most beneficial for teams as it provides more opportunities for impromptu meetings and social connections [1]. Given the significant cost-saving potential of full-time WFH (e.g. no recurring building and maintenance costs, no relocation costs of new talent, etc.) [6], it is an important issue that organizations need to better understand: whether WFH teams perceive teamwork and interactions differently based on physical work location. These are critical questions as organizations are confronting tough decisions on whether employees can remain at home or need to go back to the office.

Our study is motivated by a long-standing line of research in Computer-Supported Cooperative Work (CSCW) and Human-Computer Interaction (HCI) that has studied the factors that lead to successful remote teamwork [68, 69, 72, 90]. Much of this research highlights the importance of interpersonal factors such as common ground and trust [41, 79, 97], and the need to nurture a mindset of collaboration readiness [66]. Mechanisms for coordination and communication between remote workers via digital technologies have also been studied in depth [57, 62, 70]. This work, however, has not addressed how workers' perceptions of teamwork may be associated with their particular work arrangements at home. While there is a rich literature that has shown how different office layouts and designs can exert significant influence on productivity (for a review, see [2]), this work has not addressed how different work locations at home compare to the office when it concerns remote teamwork.

In this paper, we address this gap by focusing on three distinct types of physical work contexts: the private room at home, the shared space at home, and the office. We are interested in how each location affects self-reported perceptions of teamwork and conflict. Contrary to the push by many organizations to bring people back to the office, we found no direct association of work location with teamwork. In other words, teams can work well together in either setting. We did find, however, that participants working in a private room at home reported significantly lower team conflict compared to those working in the office. We further found that the association of work location with team conflict was moderated by people's job decision latitude and also by the type of work coupling present in their team, i.e. the level of task interdependencies that exist between co-workers.

1.1 Literature Review

The team science literature commonly distinguishes between two categories of team outcomes that can affect teamwork outcomes: *team processes* and *team states*. *Team processes* consist of communication and coordination, among others [21, 45]. Team communication is a key predictor of team performance and team commitment [42], and team coordination encapsulates how teams execute tasks with special reference to how this happens over time [44]. *Team states* include cohesion, climate, and conflict [7, 75, 103]. While past research has also considered other types of team states such as awareness [10] and transactive memory [36], for the purposes of this study we only focus on the aforementioned three dimensions. Here, cohesion and climate are concerned with the social dimensions in a workplace and how a team is embedded in an organizational context [5, 30, 78]; conflict addresses all the possible interpersonal, task-based, and process-based differences that may negatively impact team outcomes [17, 35].

Christian et al. [11] highlighted how *team states* and *team processes* are affected by environmental factors [81]. There is a long-standing history that emphasizes collocation as a crucial component of team success especially in relation to building connectedness, familiarity, and overall rapport among team members [4, 28, 35, 67, 71]. Much of this has to do with the affordances that an office environment can provide. For example, Olson and Olson showed that workers are much better engaged and perform better when they are physically collocated [70], and Matthews et al. [22] found that groups coordinate better when they are collocated. Kraut et al. [46] showed that working in a collocated environment increases the frequency of *ad hoc* and informal interactions as well the likelihood for chance encounters that can lead to fruitful team outcomes.

Remote teams, however, have fewer opportunities to build connections and connections also take more effort to cultivate. Remote work provides less opportunities for people to engage in impromptu and/or task-related communication or informal conversations in hallways or around the water cooler [45]. Studies have found that people are more hesitant to disclose information online as opposed to face-to-face (f2f) interactions [64]. Online communication can also be less emotionally fulfilling than f2f communication [77], which can lead to a decrease in physiological arousal and reduced trust [18]. Much of the work that has been done in the area of remote teamwork has highlighted the propensity of physical distance (or temporal distance in the case of remote collaborations conducted across time zones) to fuel task (i.e. work-based) and process (i.e. procedural) conflicts [35, 40]. For example, Hinds and Bailey (2003) showed that conflict in distributed teams can have detrimental repercussions on team members' shared context, familiarity, and friendships [35, 76]. Several studies with remote workers prior to COVID-19 found that people felt more socially isolated from their peers [61], and that in-person interactions in the office were seen as critical for sustaining friendships [85]. Maintaining cohesion and communication was also reported as a significant challenge for remote teams [29, 88].

When it comes to perceived productivity [58], research conducted during the COVID-19 pandemic has yielded mixed results. For example, Oliveira et al. (2020) surveyed 413 software developers in Brazil between March and April 2020 and found an increase in perceived WFH productivity [65]. Over a similar period, Weitzer et al. (2021) found a decrease in perceived productivity among Austrian people working from home [101]. Galanti et al. (2021) found that work/family conflict and work autonomy both hindered and facilitated productivity at home during the pandemic [26]. However, these studies did not account for differences between private and shared locations at home, which could relate to aspects such as levels of noise, distractions, and affordances of privacy. It thus remains an open question whether different WFH settings affect subjective perceptions of productivity. Examining team productivity in the context of WFH is important as it can help

companies and organizations better determine whether it is feasible to create permanent WFH policies for employees.

Studies conducted in the wake of the pandemic showed how difficult it can be to integrate work and home life [3, 32, 74]. This confirms prior work on full-time WFH that highlights the challenges of negotiating the often conflicting arenas of professional and domestic life [16, 49, 82]. Leshed et al. [49], for example, studied organic farm families where working lives are inextricably linked with domestic lives. They found that farm families used environmental cues related to location (indoor/outdoor/off the farm) and time (time of day, work schedules, school hours, etc.) to differentiate between these domains and make them more manageable [49]. However, the influence of different WFH locations on factors pertaining to remote teamwork has not yet been sufficiently explored.

2 RESEARCH QUESTIONS

The home is a site of complex coordination and negotiation when used as the primary workplace [13]. Therefore, in this paper we put forth the following two sets of research questions.

RQ1a: *How does the work space context relate to perceptions of teamwork during the COVID-19 pandemic?*

RQ1b: *How does the work space context relate to perceptions of team conflict during the COVID-19 pandemic?*

WFH can happen in highly heterogeneous domestic spaces where separation of work and home can be a challenge [29, 94]. For example, parents of young children surveyed during the pandemic frequently reported challenges in regards to balancing childcare responsibilities [39] while also engaging in focused work [98]. Much effort can also go into having to set up and break down a workspace in a shared environment each workday in cases where the shared space is more congested. These kinds of challenges can be distinct from possible work disruptions in certain office layouts such as open-plan configurations; these layouts tend to afford individual workers less physical separation and privacy. In the context of WFH, the main distinction here is that distractions in the office remain, by and large, within the occupational context whereas distractions during WFH often emerge from the domestic context as well.

While the management and supervision of employees is already more difficult when the majority of the workforce is geographically distributed, organizations may find it even more difficult to assess and support the needs of remote workers who conduct their work in locations that are not always dedicated solely to professional purposes. Better understanding how different work locations at home and the office relate to remote teamwork can help organizations to identify and deploy more targeted initiatives and/or interventions to support hybrid and WFH teams.

RQ2a: *How does job decision latitude moderate the relationship between work location and perceptions of teamwork/conflict during the COVID-19 pandemic?*

RQ2b: *How does work coupling moderate the relationship between work location and perceptions of teamwork/conflict during the COVID-19 pandemic?*

In this set of research questions, we explore whether the influence of work location on team outcomes is moderated by other factors relevant to both the individual team members as well as their interactions with other team members. In the case of this study, we are interested in whether *job decision latitude* and the type of *work coupling* in a team might moderate work location.

Job decision latitude is defined by Karasek [43] as the degree to which workers enjoy control, discretion, and latitude in how they approach their work tasks and responsibilities. Decision latitude is assumed to alleviate work stress [43]. Recent work has examined decision latitude to better understand employee well-being [48, 54], organizational outcomes [33], and remote work

challenges [19, 99], among others. In the context of enforced WFH during the COVID pandemic, people with high decision latitude may find it easier to manage their work and home lives while those with low latitude may find it more difficult, particularly when parenting is also part of the equation. Low job decision latitude may also be of particular concern for women who are often seen as the main person in a household responsible for managing day-to-day life irrespective of the presence of a spouse with whom responsibilities could be shared [51].

Work coupling refers to the level of interdependencies between the individual tasks of members in a team [67], and research commonly distinguishes between *tightly coupled* and *loosely coupled* organizations of work. When work is more tightly coupled, work tasks are more interdependent and often more non-routine and, thus, require more co-working and more frequent communication among team members [67]. By contrast, the work of loosely coupled teams is more routine, less interdependent, and requires less communication [67]. Remote work is less challenging for loosely coupled teams as opposed to tightly coupled teams [70]. It is not clear, however, whether work coupling moderates associations of work location with teamwork.

3 DATA AND METHODS

We analyzed data from a longitudinal, *in situ* workplace study with remote teams during the COVID-19 pandemic that utilized daily surveys (among other methods) to better understand the factors that lead to effective, high-performing teams in the modern, digital age [92]. The study was approved by the designated Institutional Review Boards (IRBs) of the participating research institutions, and all participants provided consent prior to any data collection.

3.1 Participants and Procedures

Participants were recruited with their teams through email announcements, ad campaigns on social media (LinkedIn and Facebook) as well as via existing partnerships with educational institutions and mid-sized technology companies. Enrollment of teams happened on a rolling basis and each team participated for a period of ten weeks; the choice of duration was informed by an earlier longitudinal study that used similar data collection procedures [59], and showed that two to three months of repeated measures to be an appropriate window of time to account for temporal fluctuations in participants' survey responses.

The first teams started participation on July 23, 2020, and the last team included in this study completed their participation on April 17, 2021. Each participant who completed the ten weeks of participation received a total of \$250 with an additional \$50 bonus if overall compliance with research procedures was 80% or greater; participants had the option to withdraw at any point during their participation without affecting their teammates' participation in the study. We collected data from a total of 93 information workers from 28 teams of sizes two to five from across the U.S. (from California to Indiana). One member of a three-person team as well as both members of a two-person team needed to be excluded from further analysis due to low compliance and, thus, too much missing survey data. Our final dataset, thus, used data from 91 participants who belonged to 27 teams. A team was eligible to participate if at least the majority of members were willing to participate (excluding teams of size two). It was not a requirement for supervisors to participate. Teams broadly came from the areas of consulting, software engineering, and administration as well as from startups. While prior WFH experience was not a question asked in any of the surveys, the members of three teams indicated prior WFH experience during their exit interviews. Notably, all participants with prior WFH experience were affiliated with startups.

Procedures were designed to collect participant data *in situ* and as unobtrusively as possible. Team outcome measures were collected via *Ecological Momentary Assessments* (EMA), which were short questionnaires used to collect participant responses related to team processes and states (henceforth

referred to as the ‘5Cs’) as well as team productivity. EMAs are a powerful survey method that can help circumvent the limitations of retrospective self-reports [15]. Participants received one EMA per day Mondays through Fridays for a total of 50 surveys. EMAs were administered through an online survey tool called *Expiwell* (<https://app.expiwell.com>), and its corresponding smartphone app. An initial questionnaire was also administered at the start of participation to collect mainly demographic data and job characteristic measures; participants completed a 15-30 minute semi-structured exit interview independently at the end of participation to gain additional insights about their perceptions of teamwork and their personal experiences regarding collaborations. While we also supplied participants with a wearable sensor and a Bluetooth proximity beacon to capture physiological signals as well as participants’ physical proximity to their primary workplaces, neither personal health nor mobility are the focus of this paper, and therefore these measures are not included. Similarly, the EMAs also included the 10-item short-form PANAS-Short scale [100] to measure affect, but affect is also not the focus of this paper.

Measure	Source
Team Communication	6-item team communication questionnaire from Eby et al. [21].
Team Coordination	6-item team coordination questionnaire from Eby et al. [21].
Team Cohesion	3-item perceived cohesion scale, which indexes a sense of belonging and morale [7].
Team Climate	5-item team climate questionnaire indexing trust and innovativeness from Xue et al. [103].
Team Conflict	6-item measure from Pelled et al. indexing both task and relationship conflict [75].
Team Productivity	5-item questionnaire assessing team productivity used in [58].

Table 1. Scales used to measure team processes, team states, and team productivity.

3.2 Team Outcome Measures and Missing Data Imputation

Scales used for the questions are all well-validated and listed in Table 1. Participants received only a combination of three of the 5Cs in each daily survey to reduce both cognitive burden and to keep the time it would take to complete each survey within one to two minutes. The staggered distribution of the 5Cs were balanced over a two-week period, such that participants completed each of the 5Cs a total of six times over the course of a two-week cycle for a total of five cycles. To prevent systematic bias in responses due to fixed ordering, we included the team productivity questionnaire as the first set of questions of the EMAs on five randomly-selected workdays in a given cycle and as the last set for the remaining five workdays. While all members of a team received a notification at the same time that a new EMA had become available, the notification was sent at a random time between 10 AM and 4 PM (in each team members’ local time zone) to capture participants’ in-the-moment perceptions if possible. However, study participants still had a total of six hours to complete each survey.

While compliance of the initial survey was 100% due to it being an initial requirement prior to the start of participation, the average daily compliance for the EMAs across all 91 participants was 73.7%. Proportional missingness in the outcome measures ranged from 19.55% to 32.98%. To address this, we opted for multiple imputation. In a multiple imputation framework, missing data within a data set are repeatedly stochastically predicted using the non-missing data in order to create a large number of complete/imputed data sets. A relevant statistical model (e.g., linear regression, mixed-effects models, etc.) is then applied to each of these complete sets of data. The parameter estimates from these models are then pooled for final interpretation/significance testing. In general,

multiple imputation outperforms listwise deletion as a method for handling missing data in both cross-sectional and longitudinal studies [50, 63, 87]. Multiple imputation also shows relatively strong performance in the presence of high proportions of missingness [53]. For all analyses, we employed the multiple imputation by chained equations (MICE) method of multiple imputation from the R software package *mice* [95]. We generated 50 imputed datasets, using 25 cycles per imputed dataset with the *2l.pmm* method. An analysis of pooled correlations using Pearson r revealed that participants' responses to all of the 5Cs excluding team conflict were highly correlated with each other and with team productivity (between .66 and .93). Given the different scales, we normalized the affected measures to a range of 0 to 1. Next, we computed a new outcome measure for our analyses called *teamwork* that averaged the normalized scores.

3.3 Work Location, Job Decision Latitude, and Work Coupling

To better understand where participants had set up their primary work spaces during the pandemic, we included a single question in the initial survey where participants were asked to pick the physical work context that most closely resembled their own. Below we list the possible responses to this question.

- (a) I have a work space in a private location.
- (b) I have a work space in a shared location (e.g. kitchen, living room).
- (c) I do not have a dedicated work space, and I have to ask other household members for privacy and cooperation when needed.
- (d) I do not have a dedicated work space, and I have to conduct my work in odd spaces (i.e., spaces that are not set up for work such as laundry room, garage, outdoors) when needed.
- (e) I am able to work from the office.

Only two participants chose options (c) and (d) and since both worked in environments that had at least the potential for pass-through traffic from other members in the household to occur, we subsequently included both into the group of participants who worked in a shared space at home. Among the participants who identified as either single or divorced and also indicated living alone ($n=15$), five reported that they were working from a shared space. Given the absence of distractions under such living circumstances, we added this group of five to those working from a private room at home.

Job decision latitude was obtained from Karasek's Job Content Questionnaire [43] as part of the initial survey. To quantify work coupling, we created a binary variable to indicate whether participants worked in fields where teamwork tends to be more tightly coupled (consulting, startups, project management) or more loosely coupled (administration, programming, IT support). Additionally, we consulted the interview data to confirm the groupings as the interviews included a question on work coupling (see the Appendix for a list of interview questions).

3.4 Control Measures

We chose gender, income, and the presence of children to be the most relevant demographic control variables. Studies conducted during the pandemic found significant gender gaps regarding domestic roles and how they influence people's day-to-day WFH experience during the pandemic. [20, 23]. Despite the greater flexibility enabled by working from home, single mothers in particular and those in dual-career households reported lower perceived productivity and job satisfaction [23] and found it generally more difficult balancing work and home roles than men [52]. We further expected that it would be more likely for participants with a high annual total household income (from all sources) to have access to a private room at home to set up a workplace. Annual income in the initial survey had six categories ranging from less than \$25,000 to more than \$150,000.

Due to low representation, we combined the bottom two and top two income brackets into “up to \$50k” and “\$100k or more”, respectively, for an updated total of four categories. To account for differences between participants with and without dependents we also controlled for their number as the presence of children under the age of 18 living in the same household has been linked to mental health outcomes such as depression and stress during the COVID-19 pandemic [14, 86]. Alongside these demographic variables, we further included a binary factor to account for supervisors in our sample as they may face different types of additional WFH challenges (e.g. novelty of managing a remote team, distance management, etc.) that could, in turn, influence their perceptions of teamwork and conflict.

3.5 Semi-structured Exit Interviews

We conducted a semi-structured interview with each participant within two weeks after they had completed the ten-week period of data collection. Interviews varied in length from 13 to 52 minutes with an average duration of 22 minutes. Participants were asked about the 5Cs and work coupling as well as about their general experiences of productivity and work-life during WFH. Responses were followed up with probing questions to clarify parts of a response when necessary or to hone in on new and interesting information. The interviews were not designed in direct response to the research questions in this study. Instead, they were used to provide additional context for participants’ responses to the EMAs.

For the purpose of this study, we use interview data only as part of answering research questions RQ2a and RQ2b that both address the potential role of a job-related factors to moderate the association of work location with teamwork and conflict. Specifically, we were interested whether participants’ responses could offer additional insights to the findings from our quantitative analysis. Therefore, we conducted a thematic analysis only on a specific subset of interviews with the selection based on our quantitative findings for both RQ2s. Consequently, we used a deductive approach for the coding of interviews with a focus on responses that provided information about work location, job decision latitude, work coupling, and team outcomes. Interviews were coded by the lead author with the help of another co-author. We used descriptive and dramaturgical codes [83] to identify attitudes and views relating to our variables of interest. Codes were discussed and refined during regular meetings of the research team. Based on our quantitative findings, we identified the following key themes: *accommodating others*, *newfound flexibility*, and *sticking to a common schedule*.

4 RESULTS

We first present an overview of the data collected before presenting our findings for each set of research questions.

4.1 Data Overview

Demographics for our sample of participants are shown in Table 2. The majority of participants had at least a bachelor’s degree (79%). Most teams were of sizes three (37%) and four (41%). Average tenure of teams before their respective start dates in the study was 8.1 years. Most teams (77.78%) participated with their supervisor.

Study-long averages for teamwork and conflict scores across all participants were 0.76 (SD=0.09, range: 0.52-0.98) and 10.60 (SD=3.55, range: 6.13-22.43), respectively. Chi-squared tests showed no significant differences between the three work locations and gender ($\chi^2(4) = 1.96, p=.744$), marital status ($\chi^2(6) = 2.13, p=.908$), or education ($\chi^2(8) = 6.31, p=.613$). The distribution of job decision latitude scores was slightly left skewed with an average rating of 75.91 (SD=14.25). A bit more than half of the participants (59.34%) engaged in more loosely coupled work as opposed

Gender		Work Location	
Male	57%	Private Location	57%
Female	41%	Shared Location	29%
Non-binary/third gender	2%	Office	14%
Age		Annual Income (all sources)	
18-29	34%	Up to \$50K	31%
30-39	32%	\$50k - \$75k	25%
40-49	21%	\$75k - \$100k	14%
50+	13%	More than \$100k	30%
Marital Status		Dependents	
Married	56%	0	59%
Single (never married)	33%	1	16%
In a domestic relationship	7%	2	16%
Divorced	4%	3+	8%

Table 2. Participant demographics are shown.

to tightly coupled work. Job decision latitude was moderately correlated with loosely coupled work ($r=.398$, $p<.001$).

We created a total of eight linear mixed-effects models to answer our research questions: four to examine the relationship between work location and perceived teamwork and four to investigate potential associations of work location with team conflict (four models). Each linear mixed effects model included a random intercept by team to account for the nesting structure of the data (i.e., participants nested within teams). To answer RQ1, we ran both a baseline model which only included work location and Model 1, where we controlled for demographic variables and job-role. To answer RQ2, we ran Model 2, adding an interaction of work location and job decision latitude; and Model 3, a model similar to Model 2 but with job decision latitude replaced by work coupling. Models were fitted to each MICE data set and these estimates were then pooled into a single set of estimates with p-values defined by the multiple imputation (MI) statistic.

4.2 RQ1(a|b): Associations of Work Location with Teamwork and Conflict

Our first set of research questions addressed whether work location might be associated with perceptions of teamwork and conflict. We found no association of work location on teamwork, suggesting that perceptions of teamwork (i.e. four of the 'C' measures and team productivity) can be cultivated irrespective of work location. Pooled results for the models predicting team conflict are shown in Table 3. The baseline model predicting showed that participants who worked in a private room reported significantly less daily team conflict ($Est.=-.86$, $p<.001$) than those who worked in an office. There were no significant differences between participants who worked in a shared room compared to the private room ($Est.=-.20$, $p=.528$) or the office ($Est.=.60$, $p=.182$). In Model 1, we found that the negative association of team conflict with private location remained significant after the addition of the control variables; in fact, the negative association became stronger ($Est.=-1.38$, $p=.029$). There was again no significant difference between private room and shared room. A follow up analysis for participants who worked in a private room ($n=52$) showed that 60.87% of participants in this group also worked in teams in which at least more than half of all members were also working in a private room. We then compared average conflict scores for members of this group against the rest and we found that participants in teams where the majority

Term	Baseline Model			Model 1		
	Estimate	MI Statistic	p	Estimate	MI Statistic	p
(Intercept)	4.30	12.10	<.001	4.41	6.16	<.001
Private Room	-0.86	-2.14	<.001	-1.38	-2.19	.029
Shared Room (kitchen, living room)	-0.68	-1.55	.121	-0.95	-1.35	.177
Gender (male)				-0.77	-1.87	.062
Gender (non-binary)				-1.40	-1.29	.198
Has Dependents (under the age of 18)				0.51	1.27	.203
Annual Income (\$50-\$75k)				0.92	1.62	.105
Annual Income (\$75-\$100k)				1.13	1.94	.052
Annual Income (\$100k or more)				0.77	1.44	.151
Is Supervisor				0.14	0.31	.759

Table 3. Pooled linear mixed-effects results after multiple imputation ($m = 50$, $\text{maxit} = 25$) of the association between work location and perceived team conflict (bold if significant) at baseline and with additional control variables in Model 1. The reference category for work location is the office. The reference category for income is “up to \$50k”. Numeric predictors are mean-centered.

worked in private rooms reported significantly lower team conflict ($Est. = -1.56$, $p = .036$), suggesting that shared WFH conditions may contribute to lower team conflict as well.

4.3 RQ2(a|b): Interactions of Job-Related Measures with Work Location

Our second set of research questions addressed potential interactions of work location with job decision latitude (Model 2) and work coupling (Model 3). The interaction was significant in both of the models predicting team conflict, but not when teamwork was the outcome variable. Pooled results for the team conflict models are shown in Table 4.

4.3.1 RQ2a: Interaction of Work Location with Job Decision Latitude. Results of the analysis revealed that when job decision latitude was low (i.e. -1.5 SD), perceptions of conflict were not significantly different between participants located in either a private room at home or in the office (see Figure 1). Instead, participants who were located in a shared location reported significantly higher team conflict when compared to either of the other two work locations (office: $p = .020$, private room: $p = .002$). By contrast, when job decision latitude was high (i.e. $+1.5$ SD), participants who were located in the office reported significantly higher team conflict compared to participants working in either location in the home (private room: $p = .002$, shared room: $p < .001$). When job decision latitude was average, participants with access to a private room at home reported significantly lower team conflict compared to shared room ($p = .043$). Further, we found no significant difference between perceptions of team conflict between participants in either the office or the shared room at home.

Qualitative Findings. To explain the interaction findings further we turned to our interview data. We divided our sample into participants with high decision latitude: the top 25th percentile ($n = 22$, $M = 34.55$, $SD = .99$, 12 in private, 7 in shared, 3 in office), and low decision latitude: the bottom 25th percentile ($n = 22$, $M = 21.5\%$, $SD = 3.02$, 11 in private, 4 in shared, 7 in office).

From the interview data, we identified the following two key themes that help to shed more light on our quantitative findings: *accommodating others* and *newfound flexibility*. Participants in the

Term	Model 2			Model 3		
	Estimate	MI Statistic	p	Estimate	MI Statistic	p
(Intercept)	4.40	6.91	<.001	3.59	4.80	<.001
Private Room	-1.08	-1.92	.055	-0.35	-0.46	.645
Shared Room (kitchen, living room)	-0.25	-0.38	.703	0.81	0.95	.343
Gender (male)	-0.76	-2.02	.044	-0.75	-1.92	.055
Gender (non-binary)	-0.96	-0.99	.325	-1.61	-1.59	.111
Has Dependents (under the age of 18)	0.34	0.94	.346	0.41	1.03	.305
Annual Income (\$50-\$75k)	0.71	1.42	.157	0.37	0.66	.509
Annual Income (\$75-\$100k)	0.46	0.85	.394	0.96	1.73	.084
Annual Income (more than \$100k)	0.59	1.23	.220	0.46	0.91	.364
Job Decision Latitude	0.08	2.37	.018			
Private Room * Job Decision Latitude	-0.09	-2.38	.017			
Shared Room * Job Decision Latitude	-0.19	-2.38	<.001			
Work Coupling (loosely coupled)				2.86	2.49	.013
Private Room * Loosely Coupled Work				-2.75	-2.19	.029
Shared Room * Loosely Coupled Work				-4.32	-3.25	.001

Table 4. Pooled linear mixed-effects results after multiple imputation ($m = 50$, $maxit = 25$) of the association between work location and perceived team conflict (bold if significant) with interactions of work location with job decision latitude (Model 2) and work coupling (Model 3). The reference category for work location is the office. The reference category for work coupling is "tightly coupled work". The reference category for annual income is "up to \$50k". Numeric predictors are mean-centered.

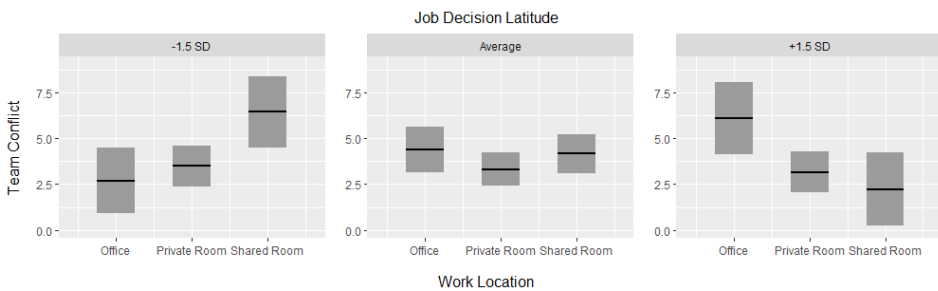


Fig. 1. Association of work location with team conflict when job decision latitude is low (-1.5SD), average, and high (+1.5SD).

upper percentile of job decision latitude scores discussed the reasons behind their low frequency of team conflict along the lines of a mindset of respect and an inherent desire to be accommodating to other team members, especially to those who were juggling not just work but also family responsibilities. *"I think we've naturally done a good job of respecting each other's knowledge and autonomy, and really paying attention to how we all work"* (P16). In such an environment of implicit understanding it may be easier to enjoy high decision latitude so much so that participants were also

able to capitalize more on their newfound scheduling flexibility: “Sometimes I don’t have meetings, so I am able to go to a park within my community with my younger kid and then spend some time there, run with him, play with him, come back, join the next meeting or do whatever I want to do” (P14). Team members in the low decision latitude group did not specifically address their low level of work autonomy in relation to team conflict. Instead, our analysis of the interviews revealed that participants who worked in a shared room at home were more likely to share an anecdote of a recent conflict in the team compared to those with access to a private room or who worked in the office.

4.3.2 RQ2b: Interaction of Work Location with Work Coupling. Results of the analysis relating to work coupling are shown in Figure 2. We found that when work was more loosely coupled (i.e., -1.5 SD) participants who were located in the office reported significantly higher team conflict compared to those who worked either in a private room ($p=.001$) or a shared room ($p<.001$). There was no statistical difference between private and shared rooms in terms of team conflict when work was loosely coupled. For teams where work was more tightly coupled (i.e., +1.5 SD), we found that participants who were located in the office reported significantly lower team conflict compared to those located in a shared room ($p=.004$), which is what we would expect given the additional challenge for people in a shared room having to frequently manage and negotiate work/home boundaries during the workday. We further found that those who were located in a private room at home reported significantly lower team conflict compared to those who worked in the office ($p=.028$). This is a somewhat surprising finding as prior work identifies the collocated setting as more suitable for tightly coupled teams [67].

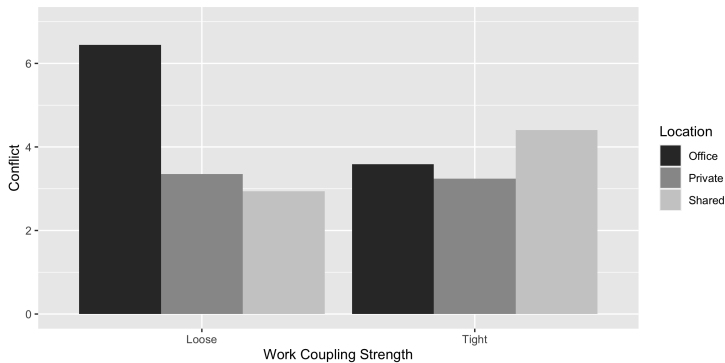


Fig. 2. Association of work coupling strength (loose or tight) with team conflict delineated by work location.

Qualitative Findings. To explain this finding further, we first created a sub-sample of participants who worked in a private room ($n=52$) and whose work was tightly coupled ($n=26$). We then selected participants whose average conflict score was below the sample average ($n=15$; nine men and six women). Most participants in this group were married (80%) and/or had children under the age of 18 in the household (73.3%). Only two were supervisors of their teams. A thematic analysis was conducted on this sub-sample of participants to identify potential themes relating to work coupling and conflict. We focused especially on participants’ responses to questions about team conflict and work coupling. For the latter we also considered questions about work/life separation and team processes as team communication and coordination are closely linked to work coupling in remote teamwork [9].

We found that about half of all participants in this particular subset addressed the theme of *sticking to a common schedule* in one form or another. For example, five participants reported

that they stuck to (relatively) consistent work hours each day, albeit based on different types of motivation: two participants indicated that the structure was based on self-motivation to better manage work/life boundaries; the other three reported that they followed a workday paradigm more reminiscent of traditional office hours (e.g. 8am to 5pm) because it was expected company policy. One participant also reported that he would put up a "do not disturb" sign to notify family members that their cooperation was still needed despite working in a private room. When asked about potential sources of conflict, one participant's response also suggested the existence of a certain code of conduct in the team to clearly communicate daily presence and availability: "*Some people may have forgotten on occasion to say they were going to be out of the office.*" (P61).

5 DISCUSSION

In this study we explored how work locations at home and in the office are related to perceptions of team outcomes in WFH teams. We operationalized team outcomes from two angles: on one side, we created an outcome variable that captured teamwork-advancing factors including team productivity, team states, and team processes; on the other side was an examination of work location and team conflict. In addition, we examined job decision latitude and work coupling as moderators of work location. In what follows, we present our key takeaways, describe implications for organizations, and address study limitations.

5.1 Key Takeaways

Our study offers initial evidence that work location has no direct association with factors that generally advance the work of a team such as communication, coordination, cohesion, climate, and productivity. We found that participants' perceptions of teamwork were similar in either work setting. This null finding should give optimism for companies and organizations to allow WFH for information workers as it does not appear to affect their perceptions of teamwork. Full-time WFH can be a viable and cost-saving alternative to co-located work that employers should not underestimate. This finding may also alleviate employer concerns about decreases in productivity and performance when teams are not working together in the office [24, 34]. However, more research is necessary to test if people's perceptions of teamwork-advancing processes and states align with objective team performance metrics and outcomes.

That said, we found that work location is associated with perceptions of team conflict. In particular, our findings show that participants who worked from a private room at home reported significantly lower team conflict compared to those who worked in the office. Adding demographic and job-related controls further strengthened the significant association. There are several possible explanations for this finding. For example, in a private WFH setting people not only can control disruptions but they can also configure their own workspace to their needs. The same cannot be said for the still overtly public setting of the office (even if people have their own private office in the building) or when people are forced to manage work in a shared room at home. In a private room, information workers are more protected from the interruptions from co-workers and members in the household as well as less limited in their options to personalize their work setup. Our results further suggest that the relative presence of private rooms as work locations in a team may be relevant. Participants who worked in a private room and also in teams where at least the majority of members worked in similar circumstances reported overall lower conflict compared to teams composed of either an even mix of work locations or where either the office or the shared room was more represented in the team.

Our results regarding the moderation of job decision latitude on the association of work location with conflict showed that participants reported higher conflict when decision latitude was low with work conducted in a shared room. People who work in a shared room and have low job decision

latitude may find it more difficult to juggle the requirements of their role with their home lives than those who have high job decision latitude, especially when young children are part of the household. More frequent and/or intense interruptions may then spill over and disrupt the work of the team. By contrast, people with low decision latitude who work in an office may have better interactions with co-workers due to the physical proximity. Future research should consider how different types of workday disruptions in shared rooms at home are related to team outcomes—after all, work in a shared room can be interrupted both remotely with an impromptu request from a teammate or in person by other members in the household.

When it comes to participants with high decision latitude we found that participants who worked from home in either location reported significantly lower conflict compared to those in the office; it is possible that increased scheduling freedom at home afforded by higher decision latitude had a beneficial influence on team dynamics that manifested in less conflict compared to participants who worked in the office. Interestingly, the degree of moderation of job decision latitude on the association of work location with conflict remained consistent for people who worked in a private room, suggesting that job decision latitude plays less of a role for this group compared to those working in either of the other two locations. One possible explanation for this came from our qualitative analysis of interviews. Respect for team members' schedules and a mindset of accommodating others came up frequently when interviewing participants with high job decision latitude. Though the majority of participants acknowledged that conflicts were easier to resolve and cohesion easier to build in collocated, face-to-face settings, those who enjoyed higher decision latitude also indicated that existing understanding of the way that team members worked allowed them to entertain more flexible work schedules. As long as this was a principle shared among all team members, then the unavailability of some members at given times during the day—which is more likely to occur in remote work than in the office—was not reported as a reason for conflict.

Our findings relating to the moderating role of work coupling on work location generally replicate earlier findings that identified loosely coupled arrangements of teamwork to be well-suited for remote teams [67, 70]. However, we also found that participants who worked in a private room and whose work was tightly coupled reported lower conflict than those in the office. Access to a private room for work may help people to mitigate the challenges of tightly coupled work [9, 70].

5.2 Implications for Organizations

Remote work is not a new phenomenon. In fact, remote work has long been a byproduct of the digital revolution, yet it has also suffered from a long history of implementation difficulties [89]. The COVID-19 pandemic has put WFH on the map and it is unlikely that this type of work organization will disappear in the future [31, 94]. In what follows, we offer a few suggestions that companies and organizations may consider when it comes to supporting full-time WFH teams.

Keeping privacy possible. We found that participants in private rooms reported lower conflict. The privacy that a private room affords may contribute indirectly to its association with lower team conflict. Therefore, it may be prudent for organizations that use open-plan office layouts to consider transitioning either to WFH or to introduce a more activity-based flexible design (for a review, see [102]), which would allow employees to create physical separation from other co-workers when needed.

Considering alternate locations. In this study, we only set out to examine two WFH locations and the office. We could not consider other types of work configurations such as commercial and even domestic co-working networks and spaces. It is reasonable to assume that perceptions of teamwork in commercial co-working spaces to be similar to the office due to (a) both being public locations and (b) offering very limited options for workspace personalization. By contrast, domestic

co-working environments such as the *Hoffice* (www.hoffice.co.in) or *Jelly* (<http://workatjelly.com/>) offer an alternative working contexts that may allow occupants both the comfort and well-being of a home environment coupled with the opportunity to engage in social interactions with others in a shared space [47, 80]. Future research should explore these work locations and potential others more in depth, especially in regards to team outcomes.

Considering the role of job decision latitude. Our results suggest that participants who worked in either setting at home reported lower conflict when their job decision latitude was high. Employers may consider affording WFH employees more decision latitude. Higher latitude can free up personal work schedules and help employees better balance family needs [27, 56]. Work autonomy is a negative predictor of burnout [84] as well as a positive predictor of remote work engagement, job satisfaction, and productivity [25, 26, 37].

Keeping a common work schedule when work is tightly coupled. Prior work has shown that tightly coupled work is typically more challenging in remote work contexts [67]. In the case of our sample, however, we found that people who worked in a private room did not differ in their perception of team outcomes whether their work was more loosely or more tightly coupled. We would expect remote teams to strive more for a loose coupling of work to ease communication and coordination. Moreover, we found that participants who worked in a private room reported lower team conflict than people who worked in an office when work was tightly coupled. Interestingly, the interview data here showed that participants who met both of these conditions (i.e. private room and tightly coupled work) maintained daily work schedules that were more aligned with their teammates. In other words, remote teams whose work is tightly coupled may consider adopting the temporal norms and schedules that are more common to the office environment and apply it to the remote context. In light of this, companies and organisations could consider encouraging remote teams to develop or adopt comprehensive and feasible online presence and availability norms. Full-time WFH already introduces new sets of challenges that are unique to each person. These challenges may be mitigated if teammates keep a common schedule, especially if their work is tightly coupled. Common schedules across team members may reduce communication and coordination problems stemming from schedules that are (too) misaligned.

Helping employees to manage work in shared rooms at home. While our results showed that participants reported lower conflict from a private room when their work was more tightly coupled, the same cannot be said for the shared room. Indeed, participants whose work was tightly coupled reported higher conflict in a shared room compared to either of the other two locations. One explanation may be the difficulties faced by people in shared spaces to maintain a meaningful separation of work and life. In turn, organizations should be mindful about the relationship of shared room with conflict in tightly coupled remote teams. However, it is always possible that there are members in tightly coupled teams who have no other option but to set up their work in a shared environment. In these situations, companies and organizations could consider affording more job decision latitude to employees.

5.3 Limitations and Future Research

Our study had several limitations. First, it is possible that participants' prior awareness that they would be participating with (a certain number of) other members from their own team could have introduced a social desirability bias that may have affected people's survey responses. Although the interviews gave us the general sense that participants were willing to freely share both the good and the bad of remote teamwork, it remains possible that participants felt the need to assess the work of their team more favorably in their responses to the EMAs. This, however, is the nature of recruiting groups of people who are familiar to each other as opposed to enrolling individuals. Our approach toward mitigating the influence of this bias was to emphasize throughout the enrolling process the

voluntary nature of participating in the study, and that individual data would be protected and not shared with teammates.

Second, our sample did not include single parents so we could not empirically test how work location affected perceptions of remote teamwork for this group. In addition, minorities were also underrepresented in our sample. There has been a good number of studies on the impact of cultural and gender norms on WFH, especially when it comes to the status of women within their families as caretakers or career seekers (see [12, 96]). Further, our findings may not translate into other cultural contexts relating to both family and work. Prior work has already shown disproportionately higher barriers to full-time WFH for minority groups [91] and opportunities for full-time WFH may unequally favor men [8]. These points need to be addressed and further clarified in future research.

We also cannot compare how participants perceived teamwork in the office before the switch to WFH as data were only collected after teams had already completed the transition. Within-person differences relating to work location should be a topic of future research especially in the context of hybrid working models, i.e. where time is split between the office and the home. Last, the tiered structure of participant compensation—while certainly appropriate—may have also impacted the results in some way.

6 CONCLUSION

The future of remote work has been hotly debated for the past two years, and a number of working models have been proposed. While several big companies appear to consider the debate already settled and have taken steps to provide full-time WFH opportunities, others have been pressing for a return to the office. However, whether the work location really plays a significant role for teamwork has not been well studied. Rather than ask people only at a single point in time, we collected repeated measures on people's perceptions of different aspects pertaining to teamwork over a period of ten weeks. Our findings generally showed lower team conflict for people who have access to a private room at home. In addition, we found a moderating influence of job decision latitude and work coupling on work location that emphasized more the differences between shared room and the office. Our study is a first step in describing how certain job-related factors moderate the relationship between work location and perceptions of team outcomes. Future research should pursue this topic in greater depth. As organizations continue to define and construct the future of remote teamwork, a better understanding of the conditions that moderate the role of work location and conflict can inform approaches to organizational support that could help people better manage their individual work locations.

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APPENDIX: INTERVIEW QUESTIONS

- (1) What individual types of diversity do you see in your team such as demographics, personalities, childcare responsibilities, work schedules, work routines, and so on?
 - (a) How does this diversity affect your team's ability to perform?
- (2) Please describe your daily work routines and rhythms and how they align with the routines and rhythms you perceive from the other members of your team.
 - (a) Depending on the response: how are the similarities or differences between schedules and work routines affecting your team's productivity?
 - (b) Have your and the team's work routines changed in the wake of the COVID-19 pandemic?
- (3) Is your work tightly or loosely coupled with other team members?
 - (a) Depending on the response: When does tightly coupled work function well and when does it not?
 - (b) Depending on the response: When does loosely coupled work function well and when does it not?
- (4) What do you see as the main challenges for your team's ability to communicate and coordinate about tasks?
 - (a) What steps do you take as a team [or leader] to address and overcome obstacles in communication? (e.g. use of technology, decision-making practice e.g. consensus, leadership, information sharing, activities outside the office)?
 - (b) Possible follow up: what has changed with Covid? Or how was it different pre-Covid?
- (5) How important is cohesion for your team?
 - (a) What techniques does your team use to bond and build connectedness?
 - (b) If team-bonding doesn't play a significant role, why not? And what do you consider more important for the success of your team?
- (6) What are some of the things that affect the mood of the team?
 - (a) What techniques does your team use to counteract negative team mood?

- (b) What techniques does your team use to create and maintain harmony?
- (7) What conflicts do you typically have in your team? Describe what happens, how conflicts start and what techniques do you apply as a team to resolve disagreements and to maintain relationships?

Optional questions if time permits:

- (1) Are you able to detach from work / Are you having difficulty detaching from work? Why?
- (2) How would you compare your current level of productivity with your team to how it was pre-COVID?
 - (a) Why higher?
 - (b) Why lower?

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