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What Happens to Psychological Safety When Going Remote?

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Psychological safety is a precondition for learning and success in software teams. But what happens to psychological safety when work becomes remote? In this article, we explore how Norwegian software developers experienced remote work under the pandemic and after restrictions were waved and describe simple behaviors and attitudes related to psychological safety. We pay special attention to work arrangements in which team members alternate days in the office with days working remotely. Our key takeaway is that psychological safety is enabled by spontaneous interaction, which is easy to facilitate in the office and hard to facilitate remotely. Our findings lead us to recommend that team members align their work modes to increase chances for spontaneous interaction in the office while benefiting from the increased focus associated with working remotely.

Professional work life has likely split irreversibly into pre-pandemic and post-pandemic times, as the better-than-expected working-from-home (WFH) pandemic experiences¹ changed the prevalence and perception of remote work in software companies. Society's reopening has clearly demonstrated that employees' willingness to return to the office differs greatly. Some have returned to their pre-pandemic routines, some visit the office only a few days per week and spend most of their time WFH, and others prefer to continue WFH indefinitely. As a result, predominantly onsite work routines must adjust to the new flexible work arrangements that exhibit a high degree of remote work.

Remote work is not a new phenomenon. The first studies on "teleworking" appeared in the 1970s and regarded it as a temporary and often partial practice chosen by few.² The rise of offshoring's popularity in the late 1990s increased the prevalence of remote work as projects became more broadly distributed geographically.³ Yet, remote WFH has never been so widespread as it is currently. Thus, the impact of WFH on software development practices has been in the spotlight of research and practice. So far, WFH research has focused on individual experiences, primarily productivity^{4,5,6} and well-

being⁷, identifying more benefits than challenges. However, individual gains in productivity enabled by the absence of office interruptions have been debated in team-oriented research that highlights the importance of constant connectivity among teammates.⁸ Teams in fully remote WFH mode suffer from a limited ability to brainstorm, difficulty communicating, and decreased satisfaction with social interactions.⁹ Similarly, prior work on partially dispersed teams (equivalent to the hybrid work mode, in which teams are split into on-site and remote workers) suggests that remote workers tend to have significantly reduced team cohesion, poor awareness of "who did what" and "who knows what," divergent viewpoints, conflicts, and team coordination problems.¹⁰ While the flexible workplace promises to reduce the challenges of fully remote working thanks to episodic co-located work, there is still no clear understanding of the impact of these new work arrangements on successful team functioning.

Psychological safety (see the sidebar) might be threatened by remote and hybrid work. While psychological safety contributes to team learning, commitment, and performance^{11,12}, little is known about how different work modes affect software teams' psychological safety. Given that the flexible workplace

seems a fixed aspect of our future, this knowledge is crucial for avoiding painful mistakes. In this article, we describe how psychological safety is affected by remote work in the company SpareBank 1 Utvikling (SpareBank 1 Development).

Sidebar: What is psychological safety?

Psychological safety is an important cognitive and interpersonal concept that relates to positive outcomes in software teams. Psychological safety is defined as “a shared belief held by members of a team that the team is safe for interpersonal risk-taking.”¹³ A psychologically safe environment minimizes the potential negative consequences of making mistakes or taking initiative, thereby refocusing teams on a task instead of interpersonal problems and thus improving performance. Psychological safety is positively related to information sharing, learning behaviors, employee engagement, satisfaction, and team members’ commitment.¹¹ Teams with high psychological safety perform better than do those in which it is low¹².

Edmondson made a fundamental contribution to defining and measuring team psychological safety in 1999¹³, explaining the phenomenon as a sense of confidence among team members that fellow teammates will not embarrass, reject, or punish each other for behaviors that are potentially unwelcome. She suggested seven Likert-type items to assess a combination of behavioral, affective, and cognitive aspects, e.g., “*It is safe to take a risk on this team*” and “*It is difficult to ask other members of this team for help.*” Inspired by these items and Edmondson’s work overall, we formulated a shorter list of items/dimensions based on our own data that we believe collectively reflect how psychological safety can be observed in the behaviors and attitudes of members of software teams (more details on how the items were formulated are in the supplemental materials):

1. **Safe to be honest:** Teammates share ideas, opinions, and concerns and bring up problems and tough issues without fear of social penalty.
2. **Safe to make mistakes:** Teammates perceive it to be okay to make mistakes and do not place blame but instead focus on learning from constructive feedback.
3. **Safe to ask for help:** Teammates perceive that it is easy to ask others for help.

4. **Valuing each other:** Teammates believe that their efforts will not be deliberately undermined (downgraded, overlooked, or ignored), have a positive attitude toward each other’s contributions, give frequent positive feedback, and acknowledge each member’s skills, talents, and inputs.

THE CASE OF SPAREBANK 1 UTVIKLING

We performed a longitudinal study of three teams from SpareBank 1 Utvikling (SB1U) during the pandemic and after the reopening of society (Figure 1). SB1U is a software development company owned by an alliance of banks that employs 24 software teams in two locations in Norway. Middle managers described SB1U as a leading agile environment in Norway using state-of-the-art collaboration methods and technologies, focusing on teams’ autonomy (including the autonomy to choose one’s work mode), as evident in the following quote:

We made some general rules but were cautious with telling teams how to organize their work [onsite vs. WFH]. Teams are allowed to find what suits them best. [Development manager]

The focus on autonomy explains psychological safety’s strategic importance for the bank, even pre-pandemic.

In March 2020, employees moved from predominantly onsite work to 100% WFH due to government-enforced regulations. In response to the changes in the virus’s spread, the offices reopened and closed repeatedly (open in summer 2020 and 2021, closed in fall 2020 and winter 2021). When open, offices had certain restrictions (limited presence and room occupancy, or social distancing). Thus, office presence was under 60%. In February 2022, the offices reopened without restrictions. Since then, employees are expected to work onsite at least two days per week, which they can choose themselves in collaboration with their teams.

Because SB1U employed distributed teams pre pandemic (e.g., Team 3, Figure 1), they had infrastructure for remote collaboration that facilitated the transition to WFH. However, remote work was still uncommon as the company’s philosophy was that agile teams operated best face-to-face.

Our findings are based on 16 semi-structured interviews: 12 interviews with members of three teams in spring 2021 and fall 2021 (see Figure 1) and

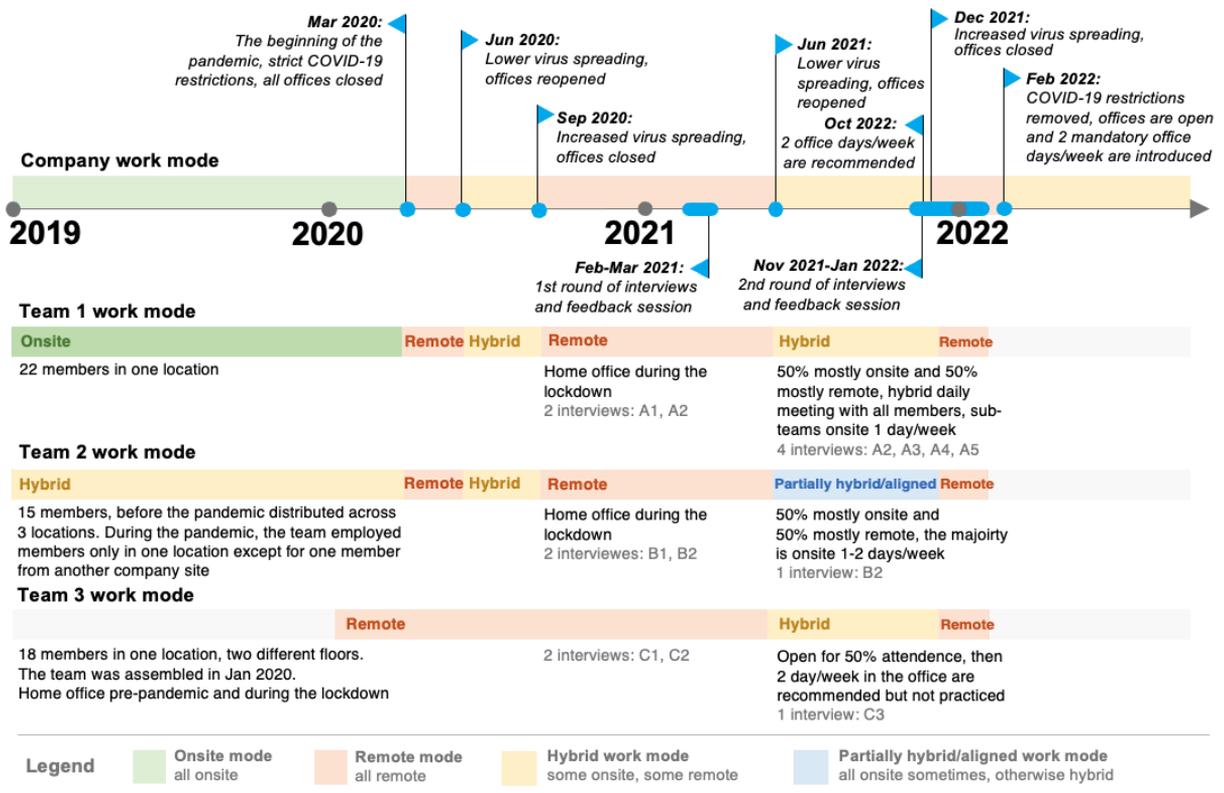


FIGURE 1. The interviewed teams, their work modes, key events, and data collection activities.

four interviews with the HR manager and the development manager. We also collected the leadership group's and the participants' feedback on our findings, secondary survey data gathered by SB1U (developers' preferences for WFH, job satisfaction 2020–2022) and other available data (office attendance, meetings data, strategy documents) to understand the company's context. The interview data was analyzed by the first and the third authors, who performed qualitative thematic coding based on four dimensions of psychological safety (see the sidebar). The analyses identified facilitating and problematic team behaviors in different work modes (remote, onsite, and hybrid; see Figure 2). For more details on the methods, see the supplemental materials.

TEAM BEHAVIORS IN VARIOUS WORK MODES

In the following, we describe how teammates reflected on the changes in behaviors and attitudes along four dimensions of psychological safety in different work modes: onsite, remote, and hybrid (Figure 2).

1. Safe to be honest

Speaking up in meetings was perceived to be easier face-to-face (F2F) than remotely. We learned that the absence of non-verbal cues makes some more hesitant to participate in discussions and more focused on listening, while technical delays in communication make people hold back due to the fear of interrupting. Online meetings and remote participation in hybrid meetings demand more structure and effort to stimulate engagement, while onsite meetings facilitate a more dynamic and spontaneous exchange of opinions:

Clearly, the threshold for joining a discussion is much higher when you join a digital meeting compared to when you join physically. [...] If several people are participating physically, you can easily notice that the digital group becomes a little passive because the activity in the room overruns what digital participants are saying. [Designer, Team A].

Behaviours and attitudes		Onsite Work in the office	Remote Work from home or elsewhere	Hybrid A mix of office and remote work
Safe to be honest	Speaking up in meetings	F2F meetings Easy to speak up	Online meetings Difficult to speak up	Hybrid meetings Remoters often remain in the listening mode
	Providing critical feedback or disagreeing	F2F feedback Harder to give, but perceived less critical than written feedback	Written feedback Likely to be withheld or perceived as overly critical	F2F feedback among those who are in the office Remoters rarely receive feedback on their actions
	Asking questions that reveal a lack of knowledge or understanding	F2F interaction Asking questions is relatively easy while working on the same task	Written communication in group chats Difficult to ask questions due to public exposure; questions take longer to formulate	F2F interaction among those who are in the office Remoters often withhold or delay their questions until F2F
Safe to make mistakes	Requesting feedback on unfinished work results	F2F interaction by one station or whiteboard Easy to reach out, explain and discuss	Digitally mediated interaction Difficult to reach out and initiate interaction	F2F interaction among those who are in the office Remoters often delay discussing unfinished work until F2F, and/or proceed without feedback
	Not blaming peers for making mistakes	F2F post-mortems and code reviews Easy due to the culture of shared responsibility and learning from failure	Remote post-mortems and code reviews Easy due to the culture of shared responsibility and learning from failure	Hybrid post-mortems and code reviews Easy due to the culture of shared responsibility and learning from failure
Safe to ask for help	Asking each other for help	Mostly F2F requests Easy to initiate, easy to see who is available, help comes promptly, written requests are easy to follow up in-person if delayed	Digitally mediated requests Chats are perceived inefficient, video/phone calls are difficult to initiate because availability is unclear, help is often delayed	F2F requests to/from those who are in the office Remoters rarely ask for help or contribute to problem-solving. Requests from remoters are usually delayed until F2F or scheduled online meetings.
Valuing each other	Giving each other positive feedback and acknowledging effort	F2F feedback Strong emotional effect, easy to compliment each other and thank for the help	Digitally mediated feedback Scheduled celebrations compensate for the lack of spontaneous feedback, low emotional effects of written (emojis, comments) and oral (online meetings) feedback	F2F feedback among those who are in the office Remoters rarely receive positive feedback about their work results
	Feeling of belonging in the team	F2F interaction Strong feeling of belonging, many chances to build informal bonds and socialize, willingness to be inclusive	Digitally mediated interaction Decreased feeling of belonging (especially for new hires), social interaction requires planning or dedicated rituals	F2F interaction among those who are in the office Remoters are likely to be alienated and excluded from the spontaneous office discussions and celebrations, the fear of missing out

Legend: Easy to behave, positive attitudes Difficult to behave, negative attitudes Mixed experiences

FIGURE 2. Behaviors and attitudes that indicate psychological safety in various work modes

Providing critical feedback. When working remotely, team members relied on written communication, which created barriers to providing critical feedback because of frequent misunderstandings:

Written format makes things ruder and more negative than meant. If you criticize in a physical

mode, one can easily solve it by discussing. [Designer, Team A]

To avoid misunderstandings, many preferred to follow up on written feedback with an in-person conversation, which is easier to accommodate onsite. In the hybrid mode, remote workers were unlikely to share critical feedback, and if they did share such feedback, rarely followed up on

it because of the hurdles to scheduling online meetings. The lack of spontaneous interaction in remote and hybrid modes was frequently mentioned as a major impediment, and remote workers reported working in isolation without frequent feedback.

Asking questions that reveal a lack of competence. Several informants indicated that asking “stupid” questions was a very important part of being honest and feeling safe among teammates. Interestingly, we found asking such questions to be relatively difficult in all work modes due to the fear of losing face when revealing one’s own incompetence. In the office, “stupid” questions can be overheard, while questions posted in team channels can be read by everyone, potentially leading to public shame. This was especially problematic for inexperienced members who were uncertain about which skills others expected them to have. We learned that asking “stupid” questions remotely required training and was easier in personal inquiry (e.g., by using one-on-one chats and scheduling short video calls):

Now I tend to just send a message and ask if one has time for a small conversation. [...] I started to ask “stupid” questions as early as possible just to be less afraid. [Developer, Team A]

2. Safe to make mistakes

Requesting feedback on unfinished work. When team members share their unfinished design sketches or code, they are likely to expose gaps and mistakes. In the SB1U teams, members were generally not afraid to reveal such mistakes. We learned that feedback requests are often spontaneous and thus easier to make in the office, such as by inviting someone to look at a screen or whiteboard. Sharing unfinished work remotely was said to be harder due to the additional effort required to initiate and the possible delay in receiving feedback:

If one shows a design at the office, one can receive instant feedback and maybe explain why one did what one did. This is way easier than to write a whole thesis on Slack. [Designer, Team A]

Not blaming team members for making mistakes.

All participants reported not fearing being blamed for making mistakes due to 1) their team’s shared responsibility for mistakes and 2) the company’s culture of learning from mistakes. One mechanism for sharing responsibility that was brought up by many was **pull requests** (PRs). These involved reviewing and exchanging feedback on the first version of the code. PRs increased collaboration and reduced the risk of putting flawed code into production. Developers described PRs as a means of reducing the blame placed on individual developers:

PR is a good safety net [...] when I write code, there is nothing that is put into production unless others have looked at it too. [Developer, Team C]

If something is wrong that is approved and goes all the way out, then [...] no one becomes a scapegoat, and you all solve it together. [Developer, Team B]

The culture of learning from mistakes can be illustrated by participants’ impressions of postmortems. These were company-established routines, adopted and welcomed by all teams, that typically followed a significant failure. Postmortems were described by several participants as crucial for psychological safety because they allowed talking about mistakes without scapegoating, thus shifting focus from “whose fault is it?” to “what have we learned?”:

Postmortems are really great; they do not only emphasize that we should not blame each other, but also [help us] achieve it in practice. [Developer, Team A]

Although PRs were always computer-mediated, and postmortems were held as onsite, remote and hybrid meetings, both seemed to provide positive effects on psychologically safe behaviors.

3. Safe to ask for help

Asking each other for help. Any request directed to teammates leads to work disruption, and we found that minimizing disturbance to others in the office was easier due to the availability of contextual clues indicating whether people are busy or not. Such clues are not available to remote workers, for whom the threshold for reaching for help increases. The absence of spontaneous peer help can lead to additional time spent on solving problems in isolation. We also found that sending written help requests was problematic for new hires until they familiarize themselves within the team:

It takes me longer to ask for help when I sit at home. [...] But I felt safer in asking for help digitally because I have now spent some time with the team physically and had some informal talks. [Developer, Team B]

Employees’ willingness to ask for help also depended on the expected speed of feedback. In the office, help requests were processed within seconds or easily followed by a reminder (knocks on the door, comments at the coffee machine). When working remotely (in remote and hybrid modes), workers could not be certain whether and when the feedback would

come. A senior developer explained that response times and ways to handle requests varied:

Some are like, "I am a little busy now, but I will look at it ASAP." Others you don't get much response from, and in a couple of days, they return with a perfect answer with tons of details. [...] Some become bottlenecks, I wait and nag... [Developer, Team A]

4. Valuing each other

Giving each other positive feedback and acknowledging efforts. Positive feedback was important to feeling valued in the team. Sharing positive feedback face-to-face was found to be effortless, and the emotional effect of such feedback was stronger than that of written feedback shared remotely or in online meetings. In fact, the probability of receiving spontaneous positive feedback remotely decreased. We found that positive feedback in team channels was often limited to the use of digital icons:

When at home we often appreciate each other's work through thumbs up and celebrative emojis in chats. [Developer, Team C]

PR comments were another way to acknowledge contributions:

I can answer the PR comments like, "Wow, I haven't thought about it!" and sometimes maybe I say "Thanks." [Developer, Team B]

While remote workers' ability to give spontaneous positive feedback seemed reduced, the established rituals of giving positive feedback were not significantly affected. For example, "FridayWins" (celebration of what was done by the team during the week) was brought up as a practice increasing the feeling of being valued in the team by celebrating teams' achievements:

The whole point of FridayWins is to acknowledge each other's achievements. [Developer, Team B]

Feeling of belonging in the team. Participants agreed that the experience of belonging in the team contributed to the feeling of being valued and was strengthened through numerous spontaneous office interactions and exchanging positive feedback. When working remotely, workers felt a weaker sense of belonging, especially among new hires who had not managed to develop informal bonds in Team A:

In the office, you get to talk about what you did during the weekend and what goes on in life. This

leads to stronger bonds and to the feeling of belonging. [Designer, Team A]

To mitigate that, Team C took actions to increase team members' feeling of belonging by dedicating time in meetings to get to know each other on a more personal level, scheduling chats over coffee, and having a digital substitute for the after-work happy hour:

We look after the social part, with regular informal coffee chats and joking. [Developer, Team C]

We also found that the hybrid mode can alienate remote workers, who are excluded from spontaneous office discussions and thus develop a fear of missing out (FOMO).

WHAT HAVE WE LEARNED?

WFH during the pandemic has recently switched to flexible work arrangements that allow individuals to choose their work mode: onsite, remote, or a mix of the two. Teams in our study typically had erratic office presence (with some members onsite and others remote), which we refer to as the *hybrid mode*. This mode's attendant challenges to psychological safety that we observed can be attributed to the formation of subgroups based on the systematic preferences of some members to work either remotely or onsite, or to the more frequent interactions among members within similar work modes. Interestingly, most members in Team 2 worked onsite on certain weekdays, on which they aimed for a fully onsite work mode, and otherwise worked in a hybrid mode (*partially aligned mode*) in which all members could interact spontaneously and solve tasks requiring feedback/clarification while onsite and maintain the flexibility of remote work (Figure 3). Although we did not observe the *fully aligned mode* (joint onsite presence on particular days and otherwise hybrid), we expect that it would provide an even higher degree of psychological safety, due to the greater chance for spontaneous interaction and the absence of subgroup formation offered by this mode. Having established this new understanding of the various work modes, we will now summarize actionable insights in terms of psychological safety for teams working in a remote or hybrid mode.

First, **to achieve and maintain psychological safety, teams should strive for onsite collaboration and spontaneous interaction.** While the general productivity of software developers does not seem to suffer from remote work⁶, our results show that psychological safety does.

Perhaps not surprisingly, we found remote work to hinder teams' psychological safety because many behaviors and

attitudes related to psychological safety are fostered by spontaneous

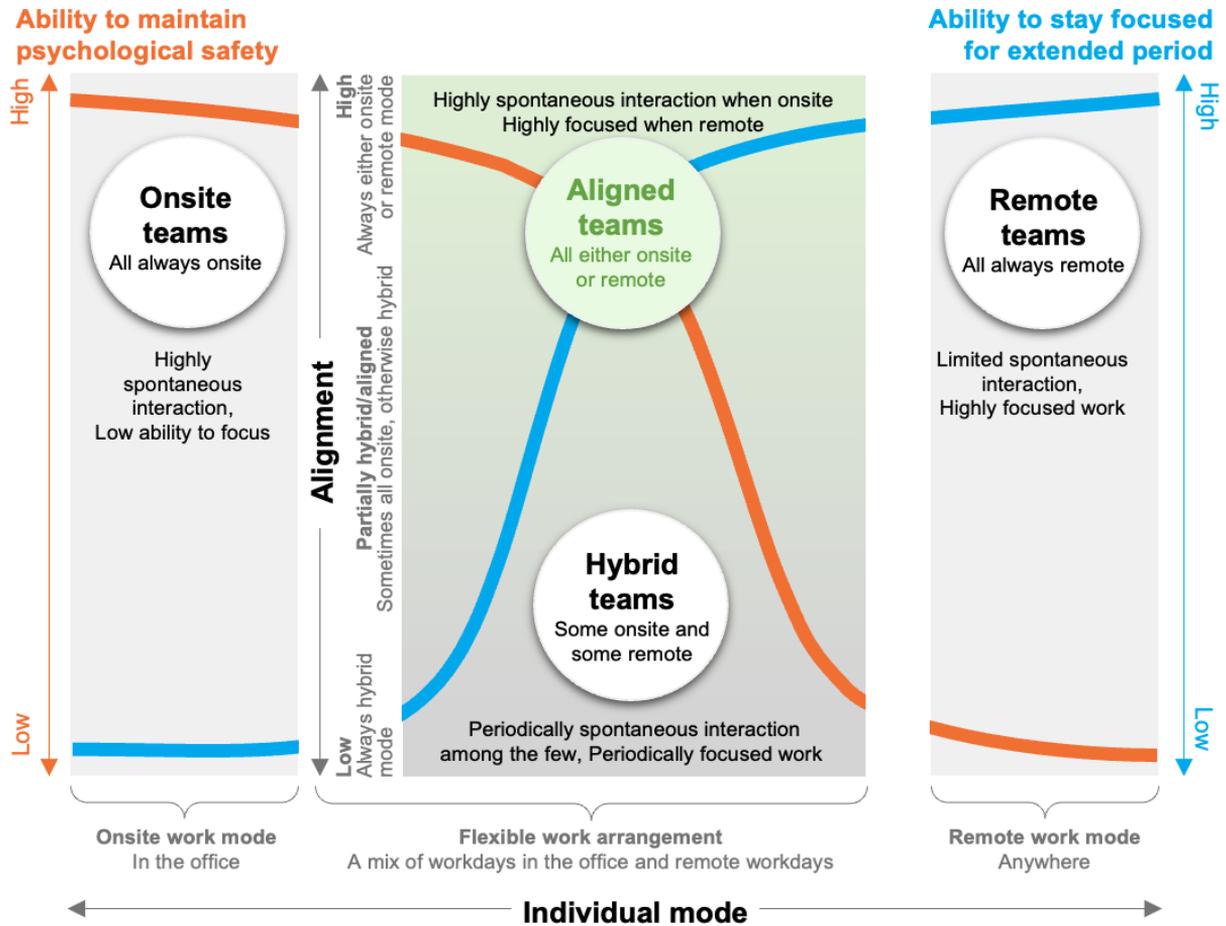


FIGURE 3. A relationship between focus and ability for spontaneous interaction in different work modes

interaction (e.g., questions, feedback exchange, speaking up) and inclusion (see Figure 2). The threshold for such behaviors is higher when working remotely due to the need for planning, waiting for a response, arranging the digital setup, or overcoming technical issues. Besides, the absence of contextual clues for remote workers makes it harder to time interactions to avoid unwelcome interruptions. Although remote work can be challenging, we showed that some teams found ways to increase spontaneous interaction even in this mode (e.g., introducing informal events online).

Second, we recommend aligning work arrangements within teams or reorganizing the teams into teams of like-minded individuals. Our findings

suggest that teams with a greater degree of individual work mode alignment can interact spontaneously when working onsite, and tap into the benefits of remote WFH without alienation or division into subgroups. Thus, the feeling of psychological safety established through joint onsite interactions would be maintained throughout the WFH days, even if important behaviors are hindered. The enduring effect of onsite interaction is especially evident in the testimonies of recent hires. However, team psychological safety in fully aligned mode is yet to be explored.

We highlight that the aligned mode can provide team members with better work focus. Some interviewees reported being highly focused and productive when WFH, as also found in related research.⁶ Interruptions, which are common when working onsite, may cost a developer 10 to

15 minutes to regain focus¹⁴, and one rarely has control over the interruptions. The aligned work mode (Figure 3) solves this problem by allowing developers to enjoy uninterrupted work on remote days, while still maintaining psychological safety when all members are onsite.

Finally, **we recommend exploring institutionalized norms and rituals that encourage teams to practice behaviors that facilitate psychological safety.** For

example, we found that post-mortems and PRs can convey higher acceptance of other's mistakes and lessen the culture of blaming, while FridayWins may increase team members' feelings of being valued. Notably, these rituals seem to provide opportunities to practice psychologically safe behaviors regardless of the work mode. Yet, future research must shed more light on the effect of such practices on psychological safety.

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