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Moving Beyond Compensating Asymmetries to Experience-Driven Cooperation

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# The Quest for “How to do Hybrid right”: Moving Beyond Compensating Asymmetries to Experience-Driven Cooperation

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Hybrid work has become increasingly popular in the aftermath of the Covid-19 pandemic. Despite its popularity, many organisations still strive to find an answer to “how to do hybrid cooperation right”. Enabling collaboration across digital and physical workspaces, participants, and practices is a great challenge, as it inevitably introduces asymmetric relations, incongruences in frames of reference, and misaligned ecosystems and technical infrastructures. The paper investigates approaches used to manage asymmetries in hybrid work settings and their impact on cooperation. Through a multi-sited ethnographic study, we reveal a prevalent reliance on mimicking tools and practices native to fully physical or fully digital settings in the hybrid space. These mimicking practices often arise because the hybrid work setting is viewed through a deficit lens, whereby it is perceived as lacking certain elements (e.g., body, voice, mobility) and access to modalities from especially the physical setting, thereby necessitating the need for compensation work. To provide vocabulary to conceptualize and articulate this type of practice, we introduce the concept *compensation work*, referring to work that is carried out to offset a deficiency or absence that has been identified, aiming to restore and re-establish a familiar state that has vanished. While compensating through mimicking is intuitive, such approaches assume that our known practices and interactions from the physical workspace can indeed be translated to another context, neglecting the fact that changing the medium inevitably impacts the message. Thus, cooperative practices and interactions taking place in the physical workspace do not remain the same when unfolding in the hybrid space. Finally, we suggest that in order to design technologies and practices that support hybrid cooperation we first need to acknowledge the hybrid workspace as a distinct “third space” next to the fully remote and fully physical workspace. This includes following an experience-driven approach to hybrid cooperation, encouraging the design of innovative interactions that extend beyond merely compensating for asymmetries and leveraging the unique capabilities and affordances of these settings.

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

Additional Key Words and Phrases: hybrid cooperative work; mimicking; compensation work; hybrid space as a third space; experience-driven cooperation

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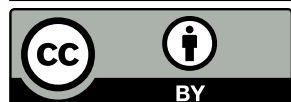
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## 1 Introduction

Hybrid and remote work practices have long existed, but the Covid-19 pandemic has accelerated their diffusion and adoption across various sectors, evolving into a more commonplace form

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of professional practice [30]. This change has been marked by a period of redefinition in the nature of workspaces, reflecting a transitional phase between the traditional on-site workplace and hybrid and remote work settings. The initial move towards remote work introduced several benefits, including, increased flexibility, reduced commuting and CO2 emission, and improved work-life-balance for employees, alongside reduced overheads and greater access to qualified labor for employers. However, this shift also posed challenges, such as “zoom fatigue” [2, 3], productivity oversights, and a decrease in informal interactions and social inclusion [52]. While many organizations acknowledge the benefits that came about with remote and hybrid work, current technologies and practices are yet far from being sufficient to support hybrid cooperative work. Thus, some organizations have returned to pre-disruption (pandemic) work arrangements in fully physical workspaces, while others have adopted a “remote-first” approach, reflecting a long-term change in organizational culture [52]. Nevertheless, it is expected that the trend of working from home will continue, but rarely in a fully remote setup [16, 30, 52]. Therefore, attention is drawn to hybrid models, which offer workers more flexibility while preserving a degree of control and stability for the employer [52]. There are various definitions of hybrid work, however, we define hybrid cooperative work as situations where at least three actors are mutually dependent on each other’s work while being located in at least two, yet fewer geographical sites than the number of people involved [17].

Distributed collaboration and hybrid cooperative work have become more common with the ongoing advancements of video-conferencing software and technologies [30]. Indeed, researchers from the fields of Computer-Supported Cooperative Work (CSCW) and Human-Computer Interaction (HCI) have carried out studies, more than two decades ago, examining hybrid work across different sectors and industries (e.g., [7, 37]). One of the seminal contributions within CSCW is that of Olson and Olson [44] which demonstrates the challenges of working across distance. Many researchers have since built upon and challenged Olson & Olson’s conclusions on the incapability of contemporary technologies to replicate face-to-face interaction and their four – later five – concepts for explaining the importance of distance in remote work [5, 7, 20, 28]. Nevertheless, despite the rapid proliferation of hybrid cooperative work and the several decades of research within CSCW and HCI, current technologies and practices are still far from being sufficient to support hybrid work. What stands out when reviewing recent research on hybrid cooperation is the persistence of certain challenges in terms of conducting and facilitating hybrid cooperation. These challenges are oftentimes described as asymmetries in the relationship between people and objects, and appear to centre around the overall topics of technical infrastructure (size and functionality of meeting rooms, hardware and software) as well as social and cultural contexts (meeting task, language and accent, cultural behaviours, team dynamics and proximity, personal habits, digital literacy, stress and the inclusiveness of remote participants) [5, 50]. Therefore, this paper focuses on these asymmetries, guided by the following research question: *How are asymmetries in hybrid cooperative work managed in practice, and what impact do these approaches have on hybrid cooperation?*

While recent academic research tries to alleviate these asymmetries by designing new technological solutions, [26, 58] everyday work practice shows attempts of mimicking the physical space in the hybrid space in order to cope with these challenges. Furthermore, there seems to be a tendency in much of the recent literature to focus on “how to do hybrid right”, finding single solutions to isolated problems assuming there is one correct way to support hybrid work [12]. This quest likewise occupies many organizations as they are grappling with the challenge of adjusting to the increased demand for alternative work models among their employees in the aftermaths of the pandemic [52]. The number of research projects and articles focusing on hybrid cooperative work has accelerated drastically in the past few years, with many of them focus on finding ways to reduce or completely eliminate the asymmetries that hybrid cooperation brings with it [43, 49, 50, 52].

Elsewhere, it was argued that these asymmetries are, not only unavoidable, but also insurmountable [5]. In this paper, we develop further this argument by identifying various mimicking strategies, demonstrating how they are put in practice to manage these insurmountable asymmetries, and presenting their consequences. We argue for the need to move beyond the quest for “the right solution” that focuses on alleviating asymmetries in the hybrid workspace. This quest often results in merely mimicking and replicating the physical space within the hybrid space. We argue that this mimicking approach is limiting, as it assumes that our established practices and interactions from the physical workspace are optimal and can be seamlessly transferred to the hybrid workspace. However, as McLuhan—a renowned communication scholar—famously notes, changing the medium alters the message [38]. Therefore, cooperative practices and interactions native to the physical workspace inevitably transform when they are transitioned into the hybrid space, thus altering the cooperation..

This paper contributes to the CSCW field by introducing the concept of *compensation work*, to provide vocabulary for conceptualizing and articulating the type of relation work [6] undertaken to reestablish common ground [44]. We define compensation work as the work that is carried out to offset a deficiency or absence that has been identified, aiming to restore and re-established a familiar state that has vanished. In hybrid settings, remote participants are typically perceived as lacking certain elements – such as body, voice, mobility, or access to specific views, tools, or conversations. This perceived lack necessitates a unique type of work: *compensation work*. This often involves mimicking interactions and practices from the physical workspace into the hybrid workspace, attempting to compensate and substitute for the vanished, yet familiar, physical workspace where everyone has a body, a voice, and is able to see the same things. While this approach of mimicking the physical space to compensate for its absence in the digital workspace is understandable, it is not always successful or it does not yield the intended results. This is because the cooperative practices and interactions that are produced in the physical workspace are not the same as in the hybrid workspace. Moreover, viewing remote participants and hybrid workspaces through a deficit lens is problematic, as they do not inherently lack anything; rather, the hybrid work environment should be recognized and acknowledged as a new “medium”, a third space alongside the physical and fully digital workspaces.

The remainder of the paper is structured as follows: We begin by laying out the theoretical foundation upon which this paper is based and provide an overview of relevant studies related to hybrid work. We then present our methods, the empirical data gathered, and our analytical approach. This leads to the presentation of our findings, where we identify various mimicking approaches used in hybrid work setting and demonstrate their consequences. Finally, we discuss the implications of the move beyond mimicking approaches towards experience-driven cooperation.

## 2 Theoretical framework

In order to establish the conceptual grounding required to investigate hybrid cooperative work, this section will provide a review of studies within CSCW and HCI. The focus will be on the nature of hybrid cooperative work and the various asymmetries produced in the hybrid workspace. We identify a tendency in some recent research literature to design technological solutions that heavily focus on reducing or eliminating these asymmetries, and argue for the need to focus instead on the types of interactions that are produced in the hybrid space.

### 2.1 Cooperative work and hybrid work

Cooperative work arrangements entail the collaboration of multiple actors dependent on each other, requiring the management of their mutual dependencies through a significant amount of *articulation work*, which refers to the extra work required before the actual work can be done [51].

Originally coined by Strauss et al. [54] articulation work refers to “all tasks involved in assembling, scheduling, monitoring, and co-ordinating all the steps necessary to complete a production task [...]” [22, p.166]. Articulation work has been found crucial, among other things, for the management of globally distributed work [37, 51] as it helps “[getting] things back ‘on track’ in the face of the unexpected, and [modifying] action to accommodate unanticipated contingencies” [53, p.84]. With the ongoing proliferation and advancement of distributed cooperation the concept of articulation work continues to play a critical role now that the focus increasingly shifts towards hybrid ways of cooperating [5, 12, 17].

Hybrid work has gained popularity but did not originate during or as a result of the pandemic. On the contrary, it has longstanding roots in both industrial and academic contexts. The pioneering efforts to develop technologies that support hybrid cooperation in industry can be traced to earlier times: The Picturephone, which was intended to facilitate video conferencing, was introduced as a commercial solution by AT&T, as early as the 1960s at the World’s Fair in New York. At that time, a single device was priced at \$250,000, which relegated this first hybrid cooperative technology to more of a science fiction fantasy than a ubiquitous everyday product [30, 47]. Nevertheless, since that era, numerous telecommunications and software companies have continuously worked on advancing and redefining a variety of technologies to support hybrid collaborations. These include video-conferencing tools such as Microsoft Teams [56] or Zoom [15], visual collaboration platforms such as Miro [40], and more recently, cutting-edge technologies like Visible, a 360-degree video-call device designed to unite all team members around a single virtual table [57].

Hybrid cooperative work is not entirely new in academia either. Within the fields of CSCW and HCI, there is a plethora of studies on *distributed work* and *collaboration across distance*, spanning various settings and sectors. Within these fields, the distance framework of Olson & Olson [44] marks a notable reference point. To collaborate successfully across distance, they argue that certain socio-technical conditions are crucial: The involved people need to share a certain degree of *common ground*, meaning a common knowledge of the situation and tasks at hand. Furthermore, the effectiveness of collaboration across distance depends on the *coupling of work*; that is, the interdependence of the tasks within the collaborative endeavour. While loosely coupled tasks can be more easily managed across distance, tightly coupled tasks with high interdependencies require frequent, complex communication among group members, posing significant challenges across distances. Two additional pivotal conditions are *collaboration readiness*, and *collaboration technology readiness*. While collaboration readiness requires an organizational culture that broadly supports and promotes sharing and teamwork in order for distance work to succeed, technology readiness demands an organization to not only be willing to adopt groupware technologies but also to modify habits and infrastructures around these technologies. Later, Olson & Olson expanded their framework by introducing a fifth condition for successful collaboration across distance: *organizational management*. Here, they emphasize not only the management of tasks but also the management of sites and people, underscoring the importance of creating a common direction towards which all group members strive, regardless of their work locations [45]. Other researchers have revisited the distance framework, arguing that the original socio-technical conditions for working across distance might change or at least their importance might change. For instance, Bjørn et al. [7] argue that technology readiness has today become an everyday practice, and that the challenge is rather the extra work required for using the cooperative technologies. While previously, working across distances was predominantly recognized and studied within software development and academic circles, the Covid-19 pandemic dramatically accelerated the adoption of remote and, as restrictions eased, hybrid work across a multitude of professional contexts. As a result, hybrid work has evolved into a prevalent work model, transforming work across distances into a daily reality for a vast populace [30, 52].

The term hybrid work is gathering increased attention and is, therefore, excessively used across both industrial and academic contexts. Consequently, a spectrum of definitions has emerged, reflecting the diverse interpretations of hybrid work. Christensen [30] adopts a holistic perspective, characterising hybrid work as a flexible arrangement where work can be executed intermittently from the physical, company-owned workspace and alternately from home or other non-traditional settings. In contrast, HCI and CSCW researchers define hybrid work more specifically as video- and audio-based meetings that encompass both collocated and remote participants [43]. Yet, other researchers from these fields emphasize that hybrid work encompasses more than just hybrid meetings, extending to both synchronous and asynchronous collaboration across distance. This encompasses situations where some participants are together collocated, while others are participating remotely [42]. We follow the definition offered by Duckert et al. [17] which posits that hybrid work involves a minimum of three participants who are mutually dependent in their work while being located across at least two, yet fewer geographical sites than the total number of participants [17]. Integrating these definitions, our discussion shifts away from a narrow focus on meetings to a broader emphasis on synchronous cooperation that spans across both physical and digital work settings. To highlight this focus, we will use hybrid *cooperative* work consistently throughout the paper.

## 2.2 Asymmetries in hybrid cooperative work

Hybrid cooperative work carries forward the challenges inherent in distributed cooperation - such as the absence of proximity and common ground - and brings about new challenges specific to the hybrid setting. As hybrid cooperative engagements take place across both physical and digital settings, additional amount of articulation work is required to manage the multiple intertwined artefacts and people across different sites, devices, and applications [12, 17]. Thus, merely sending a video-call link when arranging a hybrid cooperative activity is never sufficient, although frequently overlooked [12]. Moreover, little can be done about the incongruences in frames of reference [46] that arise in hybrid settings where an all-encompassing view is impossible since everyone has different views and, consequently, access to the hybrid cooperative setting. These incongruences lead to insurmountable gaps in hybrid collaboration, causing all hybrid work situations to be inherently characterized as asymmetric relationships [5]. In the following, we will describe and specify the various forms of asymmetry identified in the literature on hybrid work, examining them across three dimensions: the hybrid workspace, the dynamics of collaborative relations, and the underlying technological infrastructures.

**2.2.1 Hybrid collaborative space.** As highlighted by Bjørn et al. [5] hybrid settings are characterized by great incongruences in frames of reference. For instance, some individuals participate remotely, observing their colleagues solely through a screen. This limitation constrains their perspective of the collocated collaborative space and, potentially, their perception of the collaborative task unfolding in the room. Conversely, collocated participants face challenges such as the inability to employ gestures like pointing, as these actions may not resonate with the mirrored view of the remote participants [35]. Therefore, many of the asymmetries regarding the hybrid collaborative space revolve around difficulties in achieving a “what-you-see-is-what-I-see” (WYSIWIS) alignment across both remote and collocated participants [26]. Additionally, there is a notable absence of territoriality concerning the visibility and accessibility of specific spatial territories [41, 42]. Augstein et al. [1] assert that there is a significant research gap when it comes to the identification and nature of hybrid workspaces. These spaces necessitate a diverse array of support mechanisms to facilitate efficient and successful hybrid collaboration. This encompasses physical elements such as tables or large touch displays, as well as virtual support elements like awareness mechanisms and territoriality.

Furthermore, there is a need for mechanisms that promote equity between collocated and remote participants.

**2.2.2 Collaborative relations.** Other prevailing asymmetries of hybrid cooperative work are linked to diverse relational experiences between collocated and remote participants. As early as 2007, Yankelovich et al. [59] underscored inequalities in both physical and social awareness, as well as the neglect of remote participants by the in-room participants as major barriers of hybrid work environments. In 2019, Saatçi et al. [50] encountered similar challenges in their multi-sited study of hybrid cooperation in two global software companies in Europe. They noted that remote participants often feel isolated during meetings, where collocated participants tend to dominate interactions. The challenge of isolation is crucial for hybrid collaboration, as it can impact the ability of remote participants to establish trust, common culture, and shared understanding with their collocated counterparts [5, 50]. This, in turn, may impede the relation work necessary for building and maintaining cooperative relationships across distance [6]. Additionally, differences in language and accent, cultural behaviours, personal habits, digital literacy, and stress, as well as loosely coupled tasks seem to adversely impact this phenomenon of remote participant exclusion [23, 49, 50]. Although measures such as turn taking rules in hybrid settings and the implementation of new and improved technical infrastructure can prove useful in enhancing mutual awareness among participants [5, 25], the challenge of “primary room dominance”, signifying the dominance of the collocated participants in the primary on-site-room, persists as a difficult issue [26, 33, 49].

**2.2.3 Technical infrastructures.** Compared to fully collocated or fully remote work settings, hybrid settings are characterized by an even more complex ecology of artifacts that extends beyond conventional technologies, such as video conferencing tools. This complexity encompasses various constellations of artefacts available across different geographical sites in hybrid cooperation [5]. Despite the ongoing technological advancements supporting hybrid cooperative work, it appears that challenges related to technology, such as unexpected breakdowns, audio, sound, and video issues, continue to persist and contribute to asymmetries during hybrid cooperation [49, 50, 60]. The body of research addressing highly innovative standalone solutions aimed at alleviating some of these experienced asymmetries is steadily expanding. Technologies like channel blending [32], malleable videoconferencing systems [26], remote gaze visualization [58], mobile robotic telepresence (MRP) [10] and conferencing systems that actively allow for social time [24] are being developed. However, many of these systems are still several years away from achieving ubiquitous availability [1, 49]. Therefore, the operational readiness of technical infrastructure in hybrid settings remains heavily reliant on participants and their knowledge and experience in managing the ecology of artifacts as well as changing affordances of familiar tools due to sudden present-at-hand objectification of known systems [14]. In other words, participants must also navigate technical issues and breakdowns that may arise spontaneously, demanding “endless mental work by the users [...] and efficient solution-making” [50, p.58]. These diverse asymmetries and insurmountable gaps that characterize hybrid cooperative work today have prompted some researchers to seek the “perfect” hybrid solution - one that reduces incongruences in frames of reference, enhances common ground, and improves mutual awareness and the cooperative engagement across both physical and digital workspaces.

### 2.3 In search for the “perfect” hybrid setup

There is a trend in some recent literature to emphasize “how to do hybrid right”. In the pursuit of the right hybrid setup, Neumayr et al. state that “we have to be better prepared for the upcoming season(s) of hybrid work by learning from problems in the existing literature and following their suggestions on how to alleviate them” [43, p.50]. While it is undoubtedly fruitful to analyze and

learn from challenges associated with hybrid cooperative work, it is crucial to recognize that there is no singular correct way to support hybrid cooperation. Given the various types of hybrid work, there are correspondingly diverse approaches to its support.

Looking at how different researchers explore for the quest for the perfect solution, we can discern two major directions. Some literature focuses on *devising solutions for relatively isolated, de-contextualized problems*. This might involve, for instance, the development of noise reduction technologies to offset for background noises, investigations around the use of avatars or MRP Robots to compensate for the absence of the physical presence of remote participants [9, 10, 58], or the exploration of immersive environments such as gather.town, aimed at compensating for the limited informal interactions among remote participants [21]. Others are exploring methods to address the differing and incongruent perspectives of online versus physical participants, employing blended media spaces [26] or AI-powered 360° telepresence devices, with the promise of providing “equal footing [for both remote and co-located participants]” [57]. However, a common characteristic of these approaches is their identification of specific problem situations, which they seek to address preferably through technological solutions.

Other research focuses on finding *all-encompassing, one-size-fits-all solutions* designed to address all challenges associated with hybrid cooperative work simultaneously. For instance, Microsoft Research envisions, with their prototype Perspectives [48, 55], an updated version of Microsoft Teams that empowers remote participants by allowing them to digitally take a seat and behave as if they were in the collocated room. While this example explicitly translates the physical workplace into the hybrid space, aiming to eliminate all the challenges associated with hybrid cooperative work, other approaches envision the opposite - detaching hybrid cooperative work from a physical space and immersing it into virtual and augmented realities. In such scenarios, hybrid collaborations can take on diverse forms, merging the real world with augmented and virtual reality, holographic characters and “a set of digital spaces that you can move seamlessly between” [39]. Meta claims to provide the next evolution in social connection with its Metaverse, intending to “help you connect with people when you are not physically in the same place and get us even closer to that feeling of being together in person” (*ibid.*). Through the use of advanced technologies and augmented realities, the Metaverse attempts to reduce the distance between collocated and remote participants [13].

As evident from the preceding research, there is a prevailing tendency and underlying assumption that the asymmetries and insurmountable gaps in hybrid settings can be mitigated or even resolved through technology or more thorough planning. This is problematic as it implicitly establishes a causal connection between reduced asymmetries and successful hybrid cooperation. Furthermore, we have identified two overarching approaches in the quest for how to do hybrid right: One involves the development of very specific, somewhat de-contextualized technological solutions for isolated problems, while the other strives to identify universal solutions expected to solve all the challenges associated with hybrid cooperation. However, despite the numerous advantages that such technology-led solutions may offer, their efficacy has been doubted by several researchers, underscoring a significant gap between theory and practice [10].

Recent studies suggest that the preparation, planning, or, in other words, the articulation work in hybrid settings indeed plays a crucial role [12, 17]. Sokolic argues that there is a “possibility of a positive outcome for all parties involved [if just organizations] carefully plan for change and thoroughly implement [hybrid work practice]” [52, p. 210]. However, some researchers take a step further by linking the ability to manage, alleviate or solve asymmetries with a successful and efficient hybrid cooperation. This indirectly suggests a causal connection implying that fixing the asymmetries will automatically lead to a successful hybrid cooperation [50, 52]. For instance, Saatçi et al. argue that “managing these asymmetries is key to a successful hybrid meeting” [50,



p.45] emphasizing that their research “brings into light that asymmetries of interaction and social and cultural context in both co-located and remote settings can be considered as decisive factors in making hybrid meetings succeed or fail” (*ibid.*). Later, Saatçi et al. reinforced this argument by expressing that they “believe that after almost 30 years, there is still a need for thinking ‘beyond being there’ [31] in designing hybrid meeting tools that construct both more inclusive and more efficient meeting experiences” [49, p.59]. Similarly, researchers highlight the need to reduce asymmetries related to diverse experiences between collocated and remote participants [49, 50]. However, it has been argued elsewhere that these asymmetries are a-priori insurmountable gaps inherent in hybrid collaborative engagements and settings, where both collocated and remote participants always have partial access to modalities, resulting in incongruences in frames of reference [5].

In the remainder of the paper, we will develop further the argument, by illustrating how these inevitable asymmetries in hybrid settings are managed in practice, and proposing an alternative conceptualization that shifts the focus towards the types of interactions that are afforded by and produced in the hybrid workspace. But first, we will explain the methodological approach used for investigating the asymmetries of hybrid cooperative work.

### 3 Methodological approach

This paper leverages insights from a multi-sited ethnographic study encompassing eight fieldsites. Our methodological approach follows contemporary CSCW research methods [4, 8] whereby hybrid cooperative work is investigated in multiple, spatially dispersed fieldsites [29, 36] “through which the ethnographer moves” [19, p.2]. Our ethnographic fieldwork spanned eleven months (June 2022 - April 2023), covering eight fieldsites with diverse types of hybrid events. Table 1 provides a detailed overview of the empirical data. To qualify for inclusion in this study, the different hybrid events had to meet to Duckert et al.’s [17] definition of hybrid cooperative work, requiring a minimum of three participants who are mutually dependent in their work while being located in at least two, or fewer geographical sites than the number of participants.

In line with our research question, which aims to investigate how the asymmetries of hybrid cooperative work are managed in practice, we deemed it crucial to scrutinize hybrid cooperation from various perspectives. Therefore, our selection of hybrid events was guided by the objective of ensuring a diverse array of contexts and settings that would illuminate different facets of hybrid cooperative work. This study is part of a broader research project on the future of hybrid work, collaborating with ten diverse industrial partners. This collaboration granted us access to a varied range of settings, encompassing different types of hybrid cooperation, and allowed us to amass comprehensive sets of empirical data, spanning fieldnotes, photos, interviews, and recordings (Table 1; *ID 1, 6, 4, 5, 7, 8*). Two additional academic events were organized by third parties, limiting us to fieldnotes and photos without the option for recordings (Table 1; *ID 2, 3*).

We included various types of events in this study, ranging from small team meetings (Table 1, *ID 4*) with only 5-6 people to mid-sized events like two industry workshops (Table 1; *ID 1, 6*), one annual academic meeting (Table 1; *ID 3*) and a PhD course (Table 1; *ID 2*) with about 20-30 people, to large events accommodating about 80 people (Table 1; *ID 5, 7*) and a very large conference with about 200 attendees (Table 1; *ID 8*). Moreover, the selected fieldsites varied in scope, ranging from company or project internal events (Table 1; *ID 4, 1, 6*) to national (Table 1; *ID 2, 3*) and even international events (Table 1; *ID 5, 7, 8*), including various types of participants such as academics (Table 1; *ID 1, 2, 3, 6*), industrial partners (Table 1; *ID 1, 6, 7*), as well as participants from all sorts of professional backgrounds (Table 1; *ID 5, 7, 8*). Lastly, the fieldsites varied in their technical advancement, ranging from rather low-tech setups (Table 1; *ID 1, 2, 3, 6*) to settings supported by advanced technologies (Table 1; *ID 4, 5, 7, 8*). Ultimately, this heterogeneous set of hybrid cooperative events facilitates

the contrast and comparison of different approaches and practices employed when confronting asymmetries in hybrid cooperation.

Various methodological tools were employed to investigate the different fieldsites and collect data. In all eight fieldsites, in-situ observations were conducted by physically or digitally attending the hybrid event. The duration of these observation sessions varied depending on the setting, spanning from four hours (Table 1; *ID 1, 3, 6, 7*) to a full workweek (Table 1; *ID 4, 8*). The focus of these observation sessions encompassed types of collaborative practices and activities, available collaborative spaces and infrastructure, utilized tools and technologies, and challenges (asymmetries) encountered during hybrid collaborations, along with the strategies employed to address them. For in-situ observations lasting more than a workday, we maintained fieldsite diaries to structure empirical data and establish a chronological order. These diaries included fieldnotes and questions arising during the observations. When feasible, semi-structured interviews were conducted with the event organizers to gain deeper insights into the rationale behind the various decisions related to the hybrid setup and the execution of the event (Table 1; *ID 4, 5, 7, 8*) as well as with participants to capture their experience of taking part in the hybrid event (Table 1; *ID 6*). In total, ten interviews were conducted, either before, during or after the hybrid events. All but one interview were conducted as group interviews, involving minimum two and up to five participants, lasting between thirteen and forty-nine minutes. Additionally, for the two industry workshops, video cameras were strategically positioned in two corners of the room to record audio and capture participant interactions from various perspectives throughout the workshops (Table 1; *ID 1, 6*). Finally, in all eight hybrid events, photos were taken to document specific observations.

### 3.1 Data analysis

In order to comprehend the extensive qualitative data, we employed thematic analysis [11], identifying various strategies, challenges and other noteworthy findings pertaining to how the theoretically described asymmetries of hybrid cooperative work are managed in practice. Initially, we transcribed all of our interviews as well as video-recordings before uploading all empirical data to the Nvivo coding-software. Our thematic analysis unfolded in two rounds. The first round encompassed all material collected until December 2022, where we primarily delved into exploring the asymmetries of hybrid cooperation and their defining characteristics. During this analysis, the most prominent meta-themes were related to (1) the socio-cultural inclusion and exclusion of participants in hybrid cooperation, (2) the space in which hybrid cooperation takes place and (3) technical infrastructure that allows for hybrid cooperation. Notably, our attention was drawn to a specific sub-theme - “space\_mimicking approaches”. This code encapsulated instances where observed participants endeavored to leverage available technologies and practices to make the hybrid cooperative space look like the physical workspace. This behaviour appeared particularly intriguing as it revealed a distinct approach for managing asymmetries in practice. Consequently, we proceeded to a second round of coding, honing in on *mimicking approaches*. By this time we had amassed additional data from hybrid events occurring between December 2022 and April 2023. The second round of coding brought forth three compelling themes: (1) *Mimicking practices in the hybrid space* (2) *Compensation work*, elucidating the reasons behind mimicking the physical workspace and (3) *strategies deviating from mimicking*. These themes and established codes significantly influenced the conceptualization of this paper and are integral to the structure of our results section.

## 4 Findings

In this section we depict the findings from our multi-sited ethnographic study on how the asymmetries of hybrid cooperative work are managed in practice. We start by identifying mimicking practices used as a means to compensate for the asymmetries and insurmountable gaps in hybrid

Table 1. Detailed overview of the empirical data

		Hybrid event		Participants		Types of collected data
ID	Type	Date	Locations	Remote	Collocated	
1	Industry workshop	06 2022	Denmark	6	20	In-situ observations Notes Videos (9) Photos
2	PhD course	09 2022	Denmark	3	22	In-situ observations Notes Photos
3	Academic meeting	10 2022	Denmark	1	25	In-situ observations Notes Photos
4	Weekly meeting	02 2023	Denmark UK Dubai	2 1	3	In-situ observations Notes Interviews (4) Photos
5	Event	02 2023	Denmark UK Germany	32 20 17	20	In-situ observations Notes Interviews (2) Photos
6	Industry workshop	03 2023	Denmark	5	18	In-situ observations Notes Videos/Audio (9) Interview (1) Chat conversations Photos
7	Event	03 2023	Denmark UK	45 2	3	In-situ observations Notes Interviews (2) Photos
8	Conference	04 2023	Austria Denmark Poland	2 1	190	In-situ observations Notes Interview (1) Photos

work settings. We then unpack how this compensation work can take on different forms depending on available technologies and knowledge around hybrid cooperation. Eventually, we point out strategies which actively move beyond mimicking known (physical) work environments and embrace the hybrid workspace with its new opportunities for cooperation.

#### 4.1 Mimicking practices in the hybrid workspace

Our analysis from the fieldwork in multiple hybrid work contexts has revealed the interesting overall finding, that involved participants oftentimes attempt to imitate and mimic the known physical workspace in the hybrid space. In this section, we will provide ample examples of diverse mimicking practices and processes, resulting in varied *experiences* and yielding distinct *consequences*. The act of mimicking seems to stem from the necessity to compensate for the absence of the physical body, access to tactile material and surfaces, and the lack of tangible communicable clues in hybrid settings. Consequently, mimicking emerges as a approach to re-establish the familiar physical workspace in the hybrid space. However, there are noticeable differences of how successful the acts of mimicking turn out in practice depending on the specific contextual circumstances surrounding the hybrid cooperation. This encompasses factors such as the setting, format, and purpose of the hybrid cooperation, the physical and digital spaces involved, the individuals participating, and the available technological infrastructures and tools. In the subsequent section, we will demonstrate these differences and their consequences.

##### 4.1.1 Sometimes mimicking works - and makes the hybrid workspace feel like the physical space.

Numerous organizations grapple with the challenge of achieving a seamless integration of the digital and the physical space, aiming to establish a unified cooperative workspace that provides equal conditions to all employees, whether online or collocated at the office. As expressed by one of our industrial partners in our inaugural workshop, many organizations today are “trying to make [the hybrid setup] just as good as being in the office” (Video recording 1-1, 14:45). Replicating the physical workspace in the hybrid space is often done through mimicking practices and tools. Below we provide examples (Fig. 1) that illustrate how mimicking practices and tools can, at times, successfully facilitate a seamless integration of the digital and physical workspaces, fostering the creation of common experiences across both the physical and digital cooperative space.

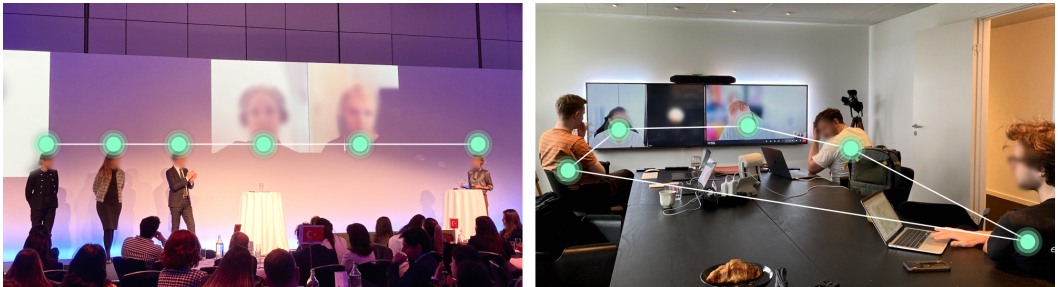


Fig. 1. Attempts of mimicking the physical workspace in the hybrid workspace that work well. Two examples; one from a conference (left picture) and one from a team meeting (right picture).

The first example is from a Q&A session during a hybrid conference (Fig. 1: picture on the left), facilitated by Alpha, one of our industrial partners that specializes in organizing hybrid meetings. Three of the speakers and a moderator are physically on stage at the venue and two speakers join remotely while the audience is also physically present at the conference venue. The venue is professionally staged, featuring three prominent screens behind the stage. The two outer screens (not visible in Fig. 1) display portrait pictures, names, and professions of all five speakers, well visible for the collocated audience regardless of their position in the room, thereby uniting online and onsite speakers. The center screen showcases the two remote speakers, framed by the three onsite speakers and the moderator on the right, collectively forming a hybrid panel. Although the

sizes of the heads of the hybrid panel vary depending on their remote or collocated attendance, the audience perceives all speakers as being on stage together, addressing their questions. Here, we see how practices from the physical space - namely placing speakers on the stage - are mimicked in the online space through careful staging, by displaying the remote speakers alongside the collocated speakers on the stage. In other words, the remote speakers are displayed at the location where they would have stood on stage, as if they were at the conference in person. The deliberate arrangement of the moderator, collocated and remote speakers, as well as the positioning of screens and cameras, reflects careful orchestration to create the illusion of a unified group of speakers presented on stage. To provide the remote participants with a similar view and experience, three strategically positioned cameras around the conference room live-stream different perspectives directly into the Teams call, through which remote participants join the event. Two rear cameras provide wide and close-up views, offering remote participants a view of the stage similar to that of the collocated participants. The third camera, placed in front of the stage and facing the collocated audience, enables remote participants to observe their collocated colleagues.

The numerous strategically positioned cameras and screens aim to replicate the collocated perspective into the digital space. However, the experiences of remote speakers are not entirely identical to those of their collocated counterparts. Remote speakers are confined to a single screen, whereas collocated speakers benefit from multiple surfaces for people and screens. Despite efforts to replicate these surfaces and views through various cameras, remote participants may encounter instances where they see themselves duplicated both on stage and in their own Microsoft Teams window. Additionally, the view of remote speakers, conveyed through a camera, lacks the ability to make eye contact with the audience and other speakers, unlike a human in the room who can easily move their heads or bodies. Nevertheless, this careful and sophisticated staging of onsite and remote speakers appeared so natural that the collocated moderator said to the remote speakers: "It was like you were here in the room, as well" (Observation notes, April 26th). This comment underscores the seamless interaction, creating an impression that the online participants were physically present in the conference space. In other words, despite the physical distance, the communication and interaction were strong enough to increase proximity, presence, and involvement for both online and collocated participants. Reflecting on the conference experiences, an employee of Alpha noted, "it seems interesting that what they're striving for, is for everyone to be in this physical space. And they're surprised when the digital space feels like the physical space" (Interview 10, 11:14). This reflection indicates that there is a general tendency to favour physical presence and that it is hard to achieve a seamless integration of the online and the physical space. Therefore, there seems to be a sense of unexpected success or accomplishment when the digital experience manages to closely mimic or replicate the experience of being physically present.

The second example is drawn from a regular hybrid team meeting (Fig. 1: picture on the right) held at the main office of one of our industrial partners. In contrast to the first example, this hybrid setup is neither complex nor costly; instead, it illustrates a typical weekly meeting with team members situated across distributed locations in the UK (1), Dubai (1), and the physical office in Copenhagen (3). The meeting unfolds in their conference room, equipped with a Poly Zoombar - an all-in-one video bar for medium-sized rooms - connected to two regular mid-sized TV screens. The three onsite people are seated around a long table, while the two remote participants from the UK and Dubai are displayed on the TV screens positioned at the table's end. Notably, all participants enjoy nearly identical access to visual and audio modalities and employ similar technologies. As evident in the picture, the participants seem to form a circle, each appearing in roughly the same size (bodywise), irrespective of their remote or on-site presence. While the provided picture only showcases the collocated perspective, it is crucial to note that remote participants also perceive the collocated participants arranged in a half-circle. This view is facilitated by the PolyCam's

wide-angle camera, which zooms in on the collocated participants when talking. Similar to the previous example, we observe a deliberate arrangement of individuals and the positioning of technologies (cameras and screens), aiming to replicate the viewpoint of collocated participants in the online space and mimicking the practices of a physical meeting (e.g., sitting in a circle and directing attention, or zooming in, on the collocated participants when talking). The collection of these tools and practices are strategically implemented to mimic the feeling of physical presence. Expressing their experience, one employee remarked, “For me, it’s been really nice to do those meetings in that room on those screens. I sort of feel more part of a group” (Interview 8, 06:24). This specific configuration of people and technologies conveys an enhanced sense of proximity and social inclusion, seemingly enriching the experience of hybrid collaboration.

To sum up, the two examples are taken from distinct cooperative settings. The first one exemplifies a large conference characterized by a costly setup and highly advanced technological tools, while the second illustrates a small weekly meeting featuring simple technological tools. Nevertheless, both examples illustrate situations where *mimicking the physical setting and practices in the digital space not only appears effective but also contributes to increased proximity and social inclusion in hybrid collaborative settings*. Furthermore, both examples provide rich details, underscoring that *this sense of togetherness did not magically appear, but emerged as a consequence of carefully planned, configured and orchestrated setups* (Fig 1).

**4.1.2 Sometimes mimicking doesn’t work - and causes breakdowns.** When the mimicking of the physical workspace in the hybrid space works, asymmetries between the online and the physical space are reduced, leading to a seamless integration between the two spaces, and producing an enhanced collaborative hybrid workspace. However, when mimicking does not work, this gives rise to situations of breakdown which amplify the physical distance and limit common understanding and the general experience of hybrid cooperation. Below, we provide examples illustrating various reasons for these breakdowns leading to diverse consequences.



Fig. 2. An example of mimicking that did not work well. The left side of the figure shows the collocated participants waiting for the remote participants while the sms conversation on the right conveys the difficulty of establishing the hybrid setting.

In spring 2023, a one-day hybrid workshop gathered fifteen industrial collaborators (four online) and eight researchers (one online) at a Danish university. The day included common plenum

sessions and three short interactive workshop sessions running simultaneously. This example zooms in on the three parallel workshop sessions, each lasting thirty minutes, with participants rotating to ensure engagement in all workshops. To mimic a physical setup where everyone is in the same space and actively include all, remote and collocated participants were intentionally mixed in the interactive workshops. Therefore, the sessions were planned thoroughly with a computer in each physical workshop room for the remote participants to enter digitally via Microsoft Teams, while the collocated workshop participants would physically walk to the specific room. For the remote participants three different Microsoft Teams channels were planned to function as virtual workshop rooms for them to enter and access materials digitally, as well as switching rooms to the next workshop. In case these virtual workshop rooms would not work the researchers had created a backup link to a regular Teams Meeting. The physical and online spaces were meticulously designed to mimic and replicate the characteristics and affordances of a physical workshop setting. Analogous to reserving three small separate rooms for the physical workshops, three distinct Teams channels were established within the overarching Microsoft Teams room to facilitate similar spatial segmentation in the digital space. Similarly, the workshop tasks entailing testing and discussing various digital prototypes, were intentionally designed to replicate the functionalities of the physical setting. Thus, while the collocated participants engaged in testing the prototypes which were displayed on tangible artifacts (i.e. a poster) and technological devices (i.e. a laptop, an iPad and an iPhone) placed on the table in the workshop room, the remote participants received a link to a Miro board gathering the links to all prototypes and the digitised copy of the artifacts. Despite thorough planning of both the physical and online space, the focus appeared to be on each space individually, rather than originally intended on the unfolding in a hybrid format where both the digital and physical workspaces would cohesively and seamlessly integrate during the workshop. This led to a series of breakdowns, predominantly impacting the remote participants.

The first situation of breakdown was set off by limitations of the Microsoft Teams channels that were meant to act as virtual workshop rooms for the remote participants. The organizing research team was unaware that only people who were members of the specific Microsoft Teams channel would be able to enter and view its content. This led to varying consequences for the participants: While the collocated participants were walking towards their respective group rooms, most remote participants encountered difficulties entering any virtual workshop room and lost all connection with their fellow remote participants, who were distributed across different workshop groups and unable to return to the plenum session link (due to lack of admin rights). Figure 2 (left) illustrates the setup with collocated participants waiting for the remote participants, unaware of their technical problems. Nevertheless, the remote participants who were supposed to be displayed on the computer in the end of the table never appeared. Upon realizing this technical limitation, the organizing researchers manually added the remote participants to the channels. However, due to technical reasons (most likely due to different organisational setups and permissions), the remote participants still could not access the virtual workshop rooms. In a final attempt to bring everyone together, the research team tried to enable the previously created backup link to a regular Teams Meeting, but neither this worked. The picture on the right side in figure 2, is taken from a text conversation capturing how the collocated and remote facilitators, in this moment of stress, struggled to understand the reason for their connectivity issues. Later, the collocated facilitator messaged the remote facilitator, saying, “Now I understand why I couldn’t enter our backup-link. It was because I was logged onto the other organizations Teams account and not on our own” (text conversation, 23.03.2023). The collocated researcher was logged into a different Teams account than the one used by the remote researcher, and she could not switch accounts because her computer was being used for video recording the workshop. While changing rooms is straightforward in physical settings (one can simply leave and enter a different room), in the online space, entering

rooms/channels require access rights depending on the institutional infrastructure, and leaving rooms/channels may result in stopping a video recording or losing online participants when ending a video call.

Below is a snapshot from the remote facilitator’s reflection upon this breakdown where she was neither able to reestablish the connection to her fellow facilitators which were onsite nor find the online participants: “I felt like a powerless facilitator. I was trying to re-enter the general room and was told that I needed to wait in the lobby until someone with the appropriate access rights could let me in. If this was in the physical space, I would simply ask the participants to wait outside the group room and fetch a key from one of my fellow facilitators. But in the online space, since the on-site facilitator stopped the call so that we could go into our sub-channels (i.e. breakout rooms), both I and the online participants were unable to enter these rooms and got completely locked out of the general channel. I kept sending emails and SMS to my co-facilitators— who were busy facilitating the workshops with the collocated participants— asking them to let me into the general channel. Meanwhile, I see an email from one of the online participants asking me to let him into the channel. This was quite stressful, as I lost contact with the online participants and had no direct way to get in touch with them. If this situation would have occurred at the venue, I would have simply walked around the building, open and close different doors, and search for the lost participants in the corridors” (Recording 5, 10:55). Eventually, the remote researcher managed to get a hold of a few of the online participants by emailing them a link to Teams video, and hold a replicated version of one of the workshop sessions with them. Due to the limited time allocated for the workshop sessions and inability to connect with the remote participants, the collocated workshop sessions was held without the remote participants, leaving them in the dark.

To sum up, despite extensive preparation and a high level of articulation work, the organizing research team found themselves grappling with several the technical breakdowns arising due to different reasons (e.g., lack of knowledge, unforeseen technical problems with certain software or hardware, complexity of the setup, differing technical infrastructures and access rights across the different universities and organisational partners, etc.). Consequently, the original intention of fostering a collective environment for all participants in the same space was paradoxically subverted. Instead of unifying and incorporating all attendees, the facilitators ended up conducting separate workshops for remote and collocated participants, resulting in the loss of several online participants who were either unable to regain access to the general channel or the sub-channels, and/or could not afford to wait for re-establishment of access. This example underscores how *when mimicking the physical space does not work*, remote participants become a secondary priority (out of sight, out of mind), thus *exacerbating the asymmetries inherent in hybrid cooperation*. These include *increased social and physical distance, along with a diminished sense of togetherness and shared understanding*. In other words, while the original idea was to run a hybrid workshop that equally includes both collocated and online participants, the breakdowns ended up significantly amplifying asymmetries, ultimately limiting access and engagement , and impairing the workshop’s quality for remote participants.

#### 4.2 Compensating for a lost status quo

So far, our analysis has illustrated how attempts of mimicking the physical workspace in the hybrid space serve as an overall approach to compensate for the absence of familiar qualities from the physical workspace (the body, access to same view and materials, etc.) - a practice that sometimes works and sometimes does not, yielding different consequences. The hybrid cooperative workspace presents novel challenges distinct from those of fully remote or fully collocated workspaces, involving the simultaneous management of both the physical and the digital workspace, along with their integration in the hybrid space. Typical drawbacks of hybrid workspaces involve the loss



of one or more senses such as vision, hearing, or control of one's own body, as well as social and physical distance. This often gives rise to different types of compensation work, implemented to counteract the drawbacks of the hybrid workspace. This compensatory effort seems to stem from the necessity to preserve a recognizable workspace where familiar technologies and practices can be applied. We found that the compensation work, undertaken to re-establish a known workspace, can manifest in diverse forms, depending on the available technologies and the participants' level of experience with hybrid settings. In the following section, we will present the two primary categories of compensation work identified in our empirical data.

**4.2.1 Reactive compensation work.** The first category that emerged from our analysis is, *reactive compensation work*, which refers to ad-hoc, informal, and low-tech efforts implemented after recognizing certain drawbacks of the hybrid setup or encountering breakdown situations.



Fig. 3. Compensating for bodily qualities in hybrid settings, trying to re-establish qualities from the physical workspace such as communication on eye level (left) and a common view (right).

The first example is drawn from a hybrid workshop where the majority of participants gathered on-site at a conference venue, while one person was joining online (Fig. 3, left). A single laptop facilitated the hybrid workshop, placed on a table at the very front of the room and oriented towards the collocated participants who were seated at tables relatively far away. The laptop screen was projected onto the wall, which made the remote speaker disproportionately visible for the on-site participants, while the more than twenty on-site participants appeared as tiny, unrecognizable heads, partly hiding behind each other due to the distance to the laptop camera. During discussions, the remote participant faced challenges in properly hearing or seeing people who remained seated in the room. To address this issue, those collocated participants asking questions went physically to the laptop, positioning themselves closer to the camera and microphone to compensate for the remote participant's inability to see and hear properly. While this solution resolved the problem for the remote participant, it posed difficulties for the collocated participants, requiring them to bend their bodies and make eye contact through the small laptop camera. Fig. 3 (left) illustrates one of the collocated participants compensating for the physical distance by approaching the laptop, kneeling down to achieve eye-level communication.

The second example is drawn from a PhD course, where three participants were joining remotely while the majority of 22 people were collocated at a Danish university (Fig. 3, right). As part of a creative group exercise, the students had to physically build and later present an artifact out of cardboard. However, since the remote participants were lacking physical bodies and were thus unable to walk, look around the room, or touch any of the building tools, the collocated participants spontaneously enabled three laptops as “portable bodies” for each remote participant (connected via a Microsoft Teams call). While this solution did not fully resolve the fact that the remote participants themselves could not actively help build but only instruct the building process, Fig. 3 (right) illustrates how one collocated participant compensated for the remote participants’ inability to walk by carrying her (the laptop) around as well as compensating for the remote participants’ inability to see the group work on the floor by tilting the screen of the laptop accordingly.

Both examples illustrate compensation work that was not carefully planned but emerged ad hoc in the situations at hand. *Due to limited planning of the hybrid session and the limited availability to advanced technologies (e.g., big projector, small laptop, etc.), participants of these hybrid cooperative events established various reactive strategies to compensation for these limitations and asymmetries.* While the first example involves collocated participants adjusting their bodies to achieve a better eye contact with the remote participant, the second example is of adjusting technologies (i.e. carrying around the laptop) to enable remote participant to see the physical artifacts in the room. However, our data analysis also revealed another type of compensation work, namely pre-emptive compensation work.

**4.2.2 Pre-emptive compensation work.** The second category that emerged from our analysis is, *pre-emptive compensation work*, and it refers to advanced, pre-planned, and highly technical compensation work put into place *before* situations of breakdown even play out. Pre-emptive compensation work refers to the efforts done to mitigate typical drawbacks of hybrid cooperation in advance, *before* they cause issues such as loss of senses, inefficiency of cooperation, etc.

As described earlier, typical issues with hybrid cooperation involve an unequal inclusion of especially remote participants due to e.g., limitations of the technology at hand or remote participants not being able to see what the collocated people see and vice versa. In hybrid sessions, it is challenging to establish eye contact both with the participants in the physical space and those in the digital space. As expressed by Alpha, one of our industrial partners who specializes in facilitating hybrid events: “It is impossible for the speaker or the person doing the [hybrid] workshop to give a good performance to both the people online and the people in the room, they’ll either be looking at people in the room, then looking at the people online, then back to the people in the room” (Interview 7, 0:23). To address the challenge of the speaker’s lack of eye contact with both the collocated and remote participants simultaneously, Alpha uses newest technology and strategic camera placement as a way to pre-emptively compensate for this expected issue.

The following collection of pictures from a hybrid event shows how a robotic camera was strategically positioned in the back of the room (Fig 5, left), situated behind the tables and chairs for the collocated participants and between two support screens displaying the presentation and speaker’s notes. Consequently, when the presenter stands on the stage (Fig 5, right), she not only views her presentation and notes on the support screens but also establishes eye contact with both collocated (direct eye contact) as well as remote participants (eye contact through robotic camera). Alpha explained that the setup was designed to naturally facilitate eye contact between the presenter and remote as well as collocated participants to thereby pre-emptively compensate for differences in engaging with remote vs. collocated participants: “So whenever they [presenters] are checking their slides, they are looking at the people at home, but they aren’t aware that they



Fig. 4. Pre-emptively compensating for challenges with same view and eye contact in hybrid settings with strategic and high-tech camera placement.

are doing that. It is just good camera placement. That means they are engaging with the [whole] audience [without thinking about it]” (Interview 7, 0:50).

The same event also illustrates how advanced technology can make WYSIWIS alignment possible in hybrid settings and thus pre-emptively compensate for the issues that arise when remote and collocated participants have unequal views on the same hybrid situation. Figure 6 presents three screenshots depicting the remote participants’ view of the hybrid event, visualizing in what way the remote participants perceived the event. This view was enabled through a well-planned digital platform created and enabled by Alpha. The left picture shows one of the presenters standing on stage while addressing the audience. The remote participants perceive the event as if looking directly at the presenter, mimicking the experience of the collocated participants who are looking directly at him from their chairs in the room. The picture in the middle shows the panel of speakers who are physically sitting in the left corner of the room. While collocated participants turn their heads to the left to view the panel, the robotic camera performs this function for remote participants, by automatically turning to the left. Consequently, remote participants enjoy the same, if not a better view of the panel, owing to the slightly elevated position of the robotic camera compared to the physical heads in the room. The picture on the right shows a picture-in-picture solution, wherein the image of a presenter standing on stage is placed next to the simultaneously running slides. This arrangement provides remote participants with a slightly cropped but equivalent view of the event compared to collocated participants.



Fig. 5. Pre-emptively compensating for the unequal views and inability of remote participants to overlook a whole room with digital platform and high-tech equipment.

However, the above hybrid setup and the configuration of pre-emptive compensation work are not easily set up, as they require a lot of preparation and planning, loads of man-hours and an endless number of cables and computers. Besides the efforts of making the physical space ready (setting up screens, several types of cameras including the robotic camera, computers to connect both cameras, audio and the software running the content) there is also put a lot of efforts into preparing the digital platform which enables the remote audience to participate on the same terms

as the collocated audience. During the hybrid cooperation there are a minimum of four or more people working full-time in order to secure the advanced, high-technological compensation work.

Despite these advanced, pre-planned, and highly technical examples of compensation work appearing to effectively mimic the physical world in the digital space, it is essential to acknowledge that such endeavors require substantial amounts of knowledge, human and technical resources, as well as a significant budget. Even with the availability of these resources and a perfectly orchestrated setup, there remains a risk of technical difficulties, such as remote participants encountering challenges in logging onto the digital platform or other unscheduled incidents. Additionally, in setups like those depicted in figure 4 and 5, a notable drawback persists in terms of mimicking the physical workspace into the hybrid space: collocated participants and presenters cannot see all remote participants. This situation is particularly frustrating for presenters of hybrid events, as expressed by one participant: “I think it’s a shame that they [remote participants] can’t all be on the screen” (Interview 6, 02:12) and another participant lamenting the lack of interactivity: “I do also quite miss the interactivity, you know, I was trying to speak to the camera a little bit [engaging]: ‘Okay, you did this, and I’m so happy and thank you’; But, you know, ultimately, it’s just a piece of hardware in front of you” (Interview 6, 05:40). According to Alpha, there are possibilities to include the remote audience in a more interactive way by broadcasting them into a Microsoft Teams meeting. However, this not only entails additional work but also introduces more risk factors to the hybrid setup: “We do lose quality of the broadcast though. It will cause a much lower resolution of the presented slides and will not look quite as good” (Interview 6, 08:14).

In sum, we have thus far provided rich examples of how *mimicking the physical workspace is used as a approach to compensate for the lack of certain bodily and practice-related qualities which are not available in the hybrid workspace*. Furthermore, we have demonstrated how *this compensation work can manifest in various forms, reactive and pre-emptive, depending on the available technologies and the level of expertise when cooperating in hybrid settings*. What is common for the already presented findings is that they all seek to re-establish some form of familiar work environment in the hybrid workspace. However, we argue that instead of mimicking known practices from the physical workspace into the hybrid workspace, we should focus on exploring the unique dynamics of the hybrid workspace.

### 4.3 Approaches for creating common experiences across the physical and online spaces

In this section, we unpack our argument about the need to move away from viewing the online space through a deficit lens, and focus instead of the kinds of affordances it has and which types of interactions it can produce. The analysis of our data reveals alternative approaches whereby the hybrid workspace is treated as a workspace with new opportunities which go beyond the mimicking of the known physical workspace. Here, the focus is rather on the experience tied to collaborating in hybrid settings than on the workspace itself.

Certain hybrid cooperations do not always afford smooth and seamless integration of remote and collocated participants, risking hampering the overall experience and meaningfulness of the interactions and cooperation (as shown in Fig. 2). To address this, we propose a shift in the conceptualization of the hybrid space, advocating for an *experience led approach* that considers the *purpose* and *types* of collaboration that the hybrid workspace can support. As expressed by Alpha’s CEO: “There are like 50, 100, 150 different versions of hybrid. So, you know, you don’t need to [...] force something that’s not [meaningful] for what you’re trying to achieve. Know what you’re trying to achieve. Plan out the right delivery that makes sense for everybody and gives them the best possible experience. That’s it. It should be experience-driven” (Interview 7, 05:56). Our fieldwork with Alpha indicates that actively moving beyond mimicking the physical space and compensating for the drawbacks of hybrid cooperation by optimizing for the purpose, context, and

people can provide innovative ways of cooperating in hybrid settings while creating meaningful interactions for both collocated and remote participants. Here, different strategies were employed to create common experiences for the participants of hybrid events, irrespective of their collocated or remote participation.

One of the approaches used for fostering shared experiences in hybrid events is Planned interruptions. These interruptions are thematic digital assets incorporated into presentations, aimed at engaging the hybrid audience in certain topics. For example, at one of the hybrid events (Table 1; *ID 7*), a small digital flag animation was integrated into the presentation slides. This flag appeared briefly when the presentation highlighted the achievement of certain team goals, visible to both collocated and remote attendees irrespective of their geographical locations. Such interruptions not only maintain audience attention and engagement in events characterized by predominantly unidirectional communication but also establish common points of reference, helping to start or continue a conversation or aiding memory retention of specific content (Observation notes, 27th February). In an talk with one of Alpha's clients, the team leader responsible for organizing the hybrid event across Denmark and the UK, explained that these planned interruptions were used to showcase that they are deliberately "thinking of ways to innovate...[and] take a different approach" (Interview 5, 05:20). This reflects a deliberate and strategic exploration of innovative methods to re-think and enhance participant engagement and interaction, and explore the potential of hybrid format.

Another approach employed by Alpha involves the implementation of small interactive tasks. This approach was observed at three hybrid events (Table 1; *ID 5, 7, 8*) and included the use of polls, quizzes (e.g. to answer questions regarding the discussed topic), the creation of word clouds, and the use of selfies. These activities were designed to engage both collocated and remote participants equally, facilitated by QR codes that were displayed and accessible via slides visible to both remote and collocated participants. Such techniques create common points of references and help fostering a sense of unity among all participants. For instance, participants were asked to share perceived challenges with their current collaboration, and all answers from both remote and collocated participants were integrated into a single visual representation in the form of a collective word cloud (Table 1; *ID 7*). In another event, participants were asked to take selfies - some were taken in the onsite event location and others were taken at home - but all upload to the same digital platform and displayed in a slide uniting collectively the pictures of all participants (Table 1; *ID 8*). These techniques seem to prompt the feeling of togetherness and interactivity, playing a role in fostering relation work across all participants.

Both strategies use different techniques to bring together collocated and remote participants by designing interactions that are inclusive and engaging for all participants, irrespective of their physical location. As explained by an employee from Alpha: "I don't think it necessarily has to be like, you're [participating] from home or you're [participating] on-site. There are other hybrid experiences that can join people together, which with a little bit of extra effort, I think can have everyone sort of on the same experience" (Interview 4, 28:10). This quote emphasizes the need to transcend the conventional binary view of on-site and remote participation in hybrid settings, suggesting a more integrated approach. It highlights the necessity for extra effort and innovation in designing hybrid experiences that ensure equitable engagement for all participants. This perspective underscores the potential benefits of rethinking traditional cooperative settings and producing a unified and inclusive experience across physical and digital spaces.

A final approach we identified in our empirical data that illustrates more sharply the move beyond merely compensating for asymmetries to leveraging the unique capabilities and affordances of the hybrid space. Alpha has currently been experimenting with MetaHumans (Fig. 6), high-fidelity, photorealistic digital copies of real people produced with the MetaHuman Creator, a free



Fig. 6. Co-founder of Alpha as a MetaHuman, a photorealistic copy of himself which can be enabled in hybrid cooperative work contexts.

cloud-based app developed by Unreal Engine [18]. These MetaHumans are distinguished not only by their realistic physical appearance but also by their ability to replicate the voice and motion of their real-life counterparts, achieved through pre-recorded motion data using node-suits (Interview 1, 28:41). This technology enables a certain person to be in multiple locations simultaneously, a quality which would never be possible in the physical workspace. This example illustrates the unique possibilities which can be harnessed of digital representation to enhance presence across multiple locations. In other words, it highlights the potentialities that can be explored when re-conceptualizing the hybrid workspace as a distinct entity, rather than merely an extension of remote or collocated settings, and shifting the focus from comparing it to the physical workspace to appreciating its unique affordances.

## 5 Discussion

Despite the widespread adoption of hybrid cooperative work [30] and the extensive research in the fields of CSCW and HCI [5, 7, 20, 28, 44], contemporary technologies and practices still fall short in adequately facilitating and supporting hybrid work. Ongoing studies in hybrid cooperation continue to unveil persistent issues that hinder effective collaboration in these environments. These issues are frequently described as asymmetries arising in the hybrid workspace affecting the relationship between people and objects. Many researchers are dedicated to developing methods that mitigate or fully resolve the asymmetries introduced by hybrid cooperation [43, 49, 50, 52]. However, it has been recently argued that these asymmetries are not only unavoidable, but also insurmountable [5]. Building further on this argument, we embarked on critically examine the complex dynamics and challenges inherent in hybrid cooperative work environments, focusing particularly on *how asymmetries in hybrid cooperative work are managed in practice*. Our study reveals that there is a strong tendency to apply various mimicking practices to address the inherent asymmetries of the hybrid workspace. These practices, as observed across various hybrid work settings, are developed as attempts to bridge the gap between the physical and digital work settings, aiming to replicate the familiar dynamics of physical work environments within a virtual context.

## 5.1 Mimicking practices and their implications

Investigating their consequences, we illustrated how the *mimicking of the physical workspace in the hybrid space can work well* through the careful configuration of the hybrid collaboration space. We do so by drawing upon two very different examples from different settings—one from a large hybrid conference (Table 1; *ID 8*) and one from a weekly team meeting (Table 1; *ID 4*). For instance, the staging at the conference of both remote and collocated speakers on a unified screen backdrop represents a deliberate effort to create a semblance of physical presence for remote participants. This practice sought to equalize the visibility and perceived participation of all speakers, regardless of their physical location. A similar phenomenon was observed in the example from the regular team meetings which was facilitated by the Poly Zoombar technology, and where the arrangement of remote participants on TV screens at the end of a conference table mimicked the traditional meeting setup, fostering a sense of inclusion and unity among all participants. While the conference entailed a rather costly setup and a highly advanced technological tools and infrastructures, the weekly meeting was conducted with only a few participants and access to rather simple technologies, thus demonstrating that effective mimicking can also be achieved without necessarily having access to costly and sophisticated technical setup. In other words, the empirical examples demonstrate that the successful integration of technology in hybrid workspace is not solely about the availability of advanced tools but also about their appropriate application and alignment with the goals and context of the cooperative engagement. Simply put, high-end technology does not automatically translate into effective hybrid cooperation if not strategically utilized to address the specific needs of the hybrid setting.

The examples underscore, however, the importance of meticulous planning, configuration and orchestration in hybrid collaboration. After all, simply sharing a video-call link when arranging a hybrid cooperative activity is never sufficient, although commonly overlooked [12]. Given that hybrid cooperative engagements span across both physical and digital settings, there is a heightened need for additional articulation work to manage the complex interplay of artifacts and people dispersed across various sites, devices, applications, and platforms [17]. These examples highlight the efforts that have been put in place in order to create a shared visual and interactive space that attempts to diminish the disparities between remote and collocated participants, enhance mutual understanding and situational awareness [5, 25], which are essential in the hybrid workspace for maintaining a continuous and coherent flow of communication and interaction. Indeed, some of the main asymmetries arising in hybrid collaborative spaces center around the difficulties related to the absence of territoriality concerning the visibility and accessibility of specific spatial territories [42, 43] as well as achieving a WYSIWIS alignment across both remote and collocated participants [26]. In sum, both examples demonstrate a successful mimicking practice which produces a setting that almost feels like the known physical workspace, fostering a sense of togetherness, increased proximity and social inclusion [5, 50]. In such situations, the emphasis shifts from the medium (whether it is digital or physical) to the message (content).

Our data also illustrated that often, *the attempt to mimic the physical workspace in the hybrid setting fails*, leading to breakdowns, ranging from technical glitches to fundamental limitations in integrating physical and digital workspaces, not only disrupting the flow of interaction, hindering the collaborative process, but also amplifying the asymmetries and leading to a disjointed experiences across the two workspaces. The example of the hybrid interactive workshop at a Danish university (section 4.1.2), where remote participants faced significant barriers in accessing virtual workshop rooms, exemplifies the highly critical dependence of hybrid cooperation on technical infrastructure. Hybrid work environment involves complex constellation of ecologies of artifacts extending beyond conventional technologies like video conferencing tools, encompassing a wide

range of artifacts across different geographical sites [5]. This shows how even well-planned setups can face unforeseen technical issues, emphasizing the fragility and complexity of these environments. The breakdowns that occurred were not only caused by, for instance, lack of knowledge or technical limitations related to institutional infrastructures but also because certain hybrid settings do not afford and thus cannot support a mimicked physical workspace. Although the setup was carefully planned, including both a physical workspace (with several workshop rooms) and a digital workspace (with several sub-channels), the connection between these many spaces did not work out during the interactive part of the workshop. This was partly because it was not fully thought through how the online and collocated spaces would interact, but it was mainly because the purpose of this workshop did not afford mixing remote and collocated people. The workshop itself was about enabling joint discussions based on experiences generating in the room. A purpose which is hard to achieve by just mimicking a fully physical workspace because the hybrid space is -in fact- something else than the physical space with different affordances and potentialities with regards to interactions, experiences, access, etc. Indeed, researchers have pointed out that there are diverse relational experiences between collocated and remote participants [5]. The workshop resulted adversely impacting the remote participant exclusion and isolation, typical challenges in hybrid collaborations [24, 49, 50]. Despite major efforts taken to balance engagement and ensure equitable participation between collocated and remote participants, the challenge persisted resulting in “primary room dominance” [26, 33].

In exploring the implications of mimicking practices, we found out that breakdowns while attempting to mimic the physical world within hybrid settings can *stem from various reasons* (e.g., lack of knowledge, unforeseen technical issues with certain software or hardware, the complexity of the setup, differing technical infrastructures, and access rights amongst different organizational partners, etc.), and these failures can lead to different *consequences* (ranging from individual to organizational effects). These breakdowns *influence* the personal experience and the quality of cooperation and outcomes, including social and cultural exclusion, limited participation, and cooperation. While the first set of examples illustrate how successful mimicking can indeed reduce asymmetries, the second example highlights how unsuccessful mimicking can greatly intensify existing asymmetries, complicating the establishment of a common ground [44], and difficulties to establish relation work [6].

## 5.2 Compensation work

Mimicking the physical workspace in the hybrid space was found to be the most distinct approach for compensating for the asymmetries that the hybrid workspace inscribe. The tendency to compensate for the absence of familiar qualities from the physical workspace is strongly related to the fact that this workspace tends to be perceived as a space of deficit, lacking access to various modalities, including for instance, tangible and material resources, subtleties of non-verbal communication, and spontaneous interaction opportunities. This compensatory strategy aligns with observations made in earlier studies [9, 27, 34]. However, in our specific study, compensation work often employs mimicking approaches that aim to make the hybrid workspace appear as physical as possible. In the remainder of the paper, we will discuss further the limitations of this approach and our proposal to view the hybrid workspace as a distinct third space, alongside the physical and the fully remote workspace, offering unique qualities and affordances. Furthermore, in contrast to these previous studies, our empirical findings reveal different forms of compensatory strategies, depending on the knowledge about hybrid settings, available technologies, and the space where the collaboration takes place.

The first form is *reactive compensation work* (Fig. 3), which emerges spontaneously, often as a direct and immediate response to unforeseen challenges in hybrid settings. We have illustrated this



with an example from a hybrid academic meeting (Table 1; *ID 3*), where the collocated participant adjusted their bodies and position to compensate for the lack of availability of technical equipment in the room and to achieve better eye contact and communication with the remote participant, and the example from the PhD course (Table 1; *ID 2*) where collocated participants carry laptops around the room to compensate for the remote participants' lack of body and mobility, and to show them the group work. Reactive compensation work is characterized by being ad-hoc and informal, often relying on low-tech solutions. The second form we identify is *pre-emptive compensation work*, which, in contrast to the previous one, involves anticipatory measures and strategic planning to mitigate potential disruptions in hybrid settings. An illustrative case from our data is the sophisticated setup employed by Alpha during one of the large hybrid events (Table 1, *ID 5*), where advanced technological arrangements were made in advance to ensure seamless integration of remote and collocated participants. Pre-emptive compensation work is carried out prior to the hybrid event; it is pre-planned and relies on highly sophisticated and costly technical tools and infrastructure. However, both reactive and pre-emptive strategies come with their inherent challenges. Reactive strategies, while quick to implement, may not always effectively address the root causes of the issues in hybrid environments. They are often temporary fixes that may not translate into long-term sustainability. On the other hand, pre-emptive strategies, despite their thoroughness, require substantial financial and technical resources— which may not be so easily available for a smaller organization. While the two forms of compensation work are different, their overall goal of compensating for the different asymmetries is the same, namely to re-establish a cooperative workspace where known practices, social norms, and interactions are applicable.

To encapsulate the specific type of work that is carried out to cope with deficits inherent in hybrid workspace, we coin the concept of *compensation work*. This term describes the collective efforts undertaken to counterbalance deficiencies or absence, with the goal of restoring and reinstating a once-familiar condition that has vanished. In other words, compensation work refers to the type of relation work [6] undertaken to reestablish common ground [44]. In hybrid settings, remote participants are typically perceived as lacking certain elements – such as body, voice, mobility, or access to specific views, tools, or conversations. This perceived lack necessitates compensation work, which involves mimicking interactions and practices from the physical workspace into the hybrid workspace, attempting to compensate and substitute for the vanished, yet familiar, physical workspace. Revisiting the examples of reactive compensation work (section 4.2.1)— the academic meeting and the PhD course—where collocated participants try to rectify the limitations inherent in hybrid cooperative settings. One might argue that these examples constitute a form of articulation work, since the work performed is intended to bring “things back ‘on track’ in the face of the unexpected” challenges [53, p.84]. While there are certain similarities between compensation work and articulation work, given that both involve additional efforts to facilitate the functioning of work processes, the distinction resides in the context of the cooperative practice. Contrary to articulation work, compensation work is tied to practices undergoing a transitional phase wherein there is no “back on track” [53, p.84] but only a different, “new track”.

Compensation work, akin to articulation work, is about the extra work required in order to make the work work [22, 51, 53, 54]. Nonetheless, compensation work is only a means to an end in order to compensate for prevailing changed affordances, qualities and interactions that the changed nature of cooperation introduces. Thus, compensation work can be seen as a subset of articulation work, pertinent specifically to situations where established norms and practices for the new status quo—in this case, hybrid cooperative work—have yet to be crystallised. Consequently, until the “new track” with its own norms, practices and affordances are established, there is a tendency to compensate for the deficiencies this new state might have by mimicking it.

### 5.3 Rethinking hybrid workspace

Many researchers and organizations are searching for the perfect hybrid setup [e.g., [43, p.50]], within which two major research directions can be identified. On the one side, there are studies that focus on developing specific technological solutions to isolated problems intrinsic to hybrid settings, such as the development of noise reduction technologies, the use of avatars or robots, and the creation of immersive environments [9, 10, 21, 30, 58]. On the other side, there are studies that focus on developing all-encompassing universal solutions, such as Metaverse and other similar platforms [13, 39, 48, 55]. Despite these technological advancements, a significant disconnect persists between the anticipated theoretical advantages and the actualized practical effectiveness and availability of these technological solutions [10]. The wide variety of examples from different settings and context shows that, in practice, there are many different types of hybrid cooperation and different ways to support these, depending on the specific contextual circumstance. Thus, it becomes evident that there is no one-size-fits-all approach to supporting hybrid cooperation; rather, it is contingent upon the nature and objectives of the collaborative effort, the technical infrastructure in place, the complex ecologies of artifacts involved, and the resources, practices and expertise at hand. Many of the recent technological solutions seem to focus on mitigating or resolving the asymmetries that are produced in hybrid settings in terms of access to modalities amongst collocated and remote participants. While it is undeniable that these asymmetries introduce many challenges, suggesting a causal connection between reducing these and a successful hybrid cooperation [50, 52] is rather simplistic. Our study provided many examples that demonstrate that a causal connection cannot be made due to the highly complex work setting which depends on a wide variety of tools and resources.

In essence, our study aims to fill the research gap about the nature of hybrid workspaces [1], and contributes to the body of literature by demonstrating the various ways in which organisations and participants create different approaches and strategies to reduce or eliminate asymmetries in hybrid work environment. Specifically, our empirical data shows that these asymmetries are often managed by mimicking tools and practices native to the physical environments in the hybrid work environments. These mimicking practices often arise because the online work setting is viewed through a deficit lens, whereby it is perceived as lacking access to modalities from the physical setting. We have argued that this approach is rather limiting, as it does not always work, and it certainly does not seem as a sustainable long term strategy due to its sophisticated requirements related to the configuration and orchestration. This has led us to rethink how we conceptualize the hybrid workspace, acknowledging it as a *new medium*, with its own unique affordances and potentialities. This entails an analytical inversion whereby the focus transitions from reducing asymmetries and perceiving the hybrid workspace as a limiting deficit space to an exploration of the unique potentialities and affordances offered by this specific space.

Traditional cooperative settings, typically characterized by physical co-presence, offer limited frameworks for understanding the dynamics of hybrid environments. The new approach we propose—viewing the hybrid workspace as a new medium—tailors the hybrid cooperation and relations to the intended experience, while recognizing the potential of hybrid workspaces to create new forms of collaboration and interaction that extend beyond the constraints of physical space. The various techniques presented in section 4.3 including for instance, the use of polls, quizzes, selfies, word clouds or MetaHumans, underscores the unique experiences and potentialities of the hybrid workspace, recognizing it as a distinct entity alongside traditional remote and collocated environments. By shifting the perspective from comparing it to the physical workspace to appreciating its unique features, we move beyond the notion of merely fixing the hybrid space.

Instead, we embrace its inherent differences, unveiling new possibilities that can enrich experiences for both collocated and remote participants.

Such techniques are also used in non-hybrid settings (i.e., fully online or physical settings), but these would be facilitated differently, serving a different purpose (e.g. to sustain attention). When these techniques are used in hybrid settings, they serve as tools to give remote participants a bit more agency and help them overcome primary room dominance that collocated participants often tend to have. Contrary to polls carried out in the room which for example are done by raising hands etc., using polls and quizzes facilitated by QR codes accessible for both online and collocated people, help them all participate on the same terms. Furthermore, the use of these digital tools creates common frames of references [46] and help fostering a sense of unity among all participants. In other words, these techniques seem to prompt the feeling of togetherness and interactivity, playing a role in fostering relation work [6] across all participants. It can be said that some of these techniques mimic to a certain extent, practices from physical settings. The use of polls or selfies for example. However, what is unique about these examples is that they demonstrate the importance of using the same device across the online and physical settings. For example, instead of taking a separate group photo of all physical participant and another one for all online participants, thus placing the online participants in a disadvantage position as they lack body; all participants are asked to take a selfie using exactly the same device (i.e. mobile device). By using a device that can cross the different medium without changing the message (i.e., all uploaded pictures are of individual faces), the boundary between the online and physical space moves to the background, producing a new setting– namely the hybrid setting–which unites all participants.

This leads to the following *implications for design*: First, we argue for the importance of *rethinking the hybrid space and conceptualizing it as a third space next to fully remote and fully physical workspace which includes investigating its unique affordance and capabilities* rather than focusing on re-establishing the known physical workspace. Second of all, we call for a *critical attention to how a change in the medium –from the physical workspace to the hybrid space– also changes the message*. Therefore, the focus should be on finding ways to tailor hybrid cooperations to the intended experience, thus supporting the types of relations that are produced within and across both the physical and online cooperative settings. Furthermore, we argue that these capabilities and affordances of the hybrid workspace need to be fully explored by researchers. While some of the examples provided by Alpha (e.g., planned interruptions or MetaHumans)–a highly professional organization which specializes in managing hybrid cooperative events–may not be easily applicable in other organizational settings that do not necessarily have the human, intellectual and economic resources, we argue that we still can learn from their approach by focusing on the cooperative experience rather than the workspace itself. This can, for example, include engaging the participants in a certain game/task that is not tied to a specific location but fosters their personal relations. Or, rather than raising hands to survey a certain opinion across a hybrid crowd one can use digitally facilitated polls which are accessible and visible across the collocated and remote locations. These are just very brief examples of how an *experience-driven approach* to hybrid cooperation can open up for more innovative ways of interacting and thus harnessing the capabilities of the hybrid space. Hence, we argue that everyone engaged with hybrid cooperative work but especially those who are in charge of managing and facilitating hybrid cooperation should reflect upon the relational aspects required for a specific cooperation, aiming at creating shared experiences and making use of the unique affordances of the hybrid space. This means, instead of trying to mimic the known physical workspace they should rather explore the format of the hybrid cooperation, considering the intended experience, purpose, involved people as well as available technologies. In other words, tailoring the hybrid cooperation to the situation at hand.

Referring back to the latest research [16, 30, 52] hybrid cooperative work has come to stay—thus we see a great opportunity for both researchers and practitioners, designers and developers of technologies for this specific workspace to look beyond the deficit view of hybrid cooperative work, trying to find one-size-fits-all or isolated patch-solutions in their quest for how to do hybrid right. Rather, they should investigate new ways of enabling the opportunities of the hybrid space, designing for experiences rather than compensating for the asymmetries of the hybrid workspace.

#### 5.4 Study limitations and future research directions

The fact that hybrid cooperative work naturally takes place in at least two or more locations brings a new notion to multi-sited ethnographic work. Not only does our multi-sited study include eight different fieldsites, means contexts through which we as ethnographers move. Every fieldsite itself consists of at least two or more sub-fieldsites across which the distributed participants cooperate. Trying to understand both collocated and remote participant in a hybrid cooperation challenges the ethnographic work as one is rarely able to investigate both views at the same time. Only in two out of our eight fieldsites we were able to actively observe both the collocated and the remote participants at the same time: In the hybrid workshop (Table 1; ID 6,7) we were two ethnographers, one following the remote participants while the second was following the collocated participants. In the hybrid event (Table 1; ID 5) only one ethnographer was investigating the field, being collocated at the event location. However, due to a special technical setup the ethnographer could simultaneously follow the view of the remote participants through a digital platform on the computer. Hence, wherever feasible we tried to use video-recordings as well as photos to capture the different angles (remote as well as collocated) of a fieldsite as faithful as possible. Furthermore, while we have studied eight different fieldsites, which provided us with a wide variety of settings, a longitudinal study can help provide a deeper understanding of the evolving nature of hybrid work environments.

## 6 Conclusion

We set out highlighting a general tendency of recent academic literature to search for “how to do hybrid cooperation right”. This tendency is characterized by a general assumption that the asymmetries and insurmountable gaps in hybrid settings can be reduced or even solved with the help of technology or thorough planning; indirectly drawing a causal connection between reduced asymmetries and successful hybrid cooperation. Curious about how the quest for the right hybrid cooperation plays out in the field, we aimed to study how the asymmetries of hybrid cooperative work are managed in practice, in actual hybrid cooperative settings. Through a multi-sited ethnographic study across eight fieldsites featuring both small scale and extensive hybrid cooperations we found mimicking the physical workspace in the hybrid space to be an overall strategy to compensate for the lack of known qualities from the physical workspace. To encapsulate this specific type of work and provide a vocabulary to articulate it, we coin the concept of *compensation work* which we define as all the work that is carried out in order to compensate for a lack of something; a deficit that has come with a new status quo and which is done to re-establish the known state that has vanished. Compensation work can take on different forms (reactive or pre-emptive) and is –contrary to articulation work– closely tied to work practices which are going through a transitional phase. While the concept compensation work was born out of the specific context of hybrid work environment, it can be applied to various cooperative settings and context, providing a useful vocabulary to articulate a specific type of work that is undertaken to offset a deficiency or absence that has been identified, aiming to restore and re-established a familiar state that has vanished. Furthermore, our qualitative data reveals approaches which actively move beyond mimicking the known physical workspace but explore the hybrid workspace as a new medium, fostering its affordances and the (new) interactions possible in this collaborative space.

Thus, we conclude that in order to design technologies and practices that specifically support hybrid cooperation we first need to acknowledge the hybrid workspace as a third space next to the fully remote and fully physical workspace. Second, we call for a deeper awareness for how the changing medium also changes the message. And finally, we argue for the need to look beyond compensating asymmetries towards relational cooperation that investigates the new opportunities of the hybrid space according to the context (purpose of collaboration, involved people, available technologies etc.) and sets the creation of a collective experience as the primary design goal.

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