Navigating the dual influences of shared cognition on coordination processes: organizational and team-level responses in an air display squadron

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Abstract: Coordination in organizations has been a central topic in research for years. However, the relationship between coordination and cognition is still to be explored, especially since past studies produced ambivalent conclusions as to the benefits of shared cognition for coordination processes. Based on the ethnographic study of an air display squadron, we explore these dual influences and how coordination processes might benefit from shared cognition while avoiding its pitfalls. We show that beneficiating from shared cognition is based on both organizational and team level phenomena. We contribute to the existing literature by drawing attention towards the equivocal influence of shared cognition on coordination processes and by highlighting that bridging team and organizational dimensions is key to achieve better coordination in this regard.

Key words: coordination, organization, shared cognition, team, turnover

1. INTRODUCTION

Coordination in organizations has been a central topic in research for years. However, the relationship between coordination and cognition is still to be explored, Over the last decade, the notion that shared cognition benefits groups' performance has been particularly pointed out by contributions on coordination practices (for example, Faraj and Xiao, 2006; Rico *et* al., 2008; Foss and Lorenzen, 2009) and team reliability (for example, Canon-Bower *et* al., 1993; Weick and Robert, 1993; Berman *et* al., 2002; Zohar and Luria, 2003; Ellis, 2006). Authors suggest that groups coordinate best when their members share a mental model that enables them to synchronize their tasks and take appropriate action without having to communicate (Cannon-Bower et al, 1993; Klimoski and Mohammed, 1994).

Although the relationship between shared cognition and team performance is today well established, several lines of research suggest that it can also impede group coordination

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in a different way, producing ambivalent conclusions as to the benefits of shared cognition for coordination processes.

Viewed broadly, past research suggests that shared cognition simultaneously enhances and impedes team coordination and performance. As a result, managers face a paradox: how taking advantage of the values embodied in shared cognition without being hampered by its dysfunctional down side? The objective of this article is to explore practices shaped by teams *in situ* to handle the dual nature of shared cognition.

Based on the ethnographic study of an air display squadron, we explore these dual influences and how coordination processes might benefit from shared cognition while avoiding its pitfalls. We show that beneficiating from shared cognition is based on both organizational and team level phenomena. We contribute to the existing literature by drawing attention towards the equivocal influence of shared cognition on coordination processes and by highlighting that bridging team and organizational dimensions is key to advance our understanding of coordination in this regard.

2. BACKGROUND

The coordination of actors and activities is probably one of the most recurrent concerns in organization studies. Ever since Taylor (1916), Fayol (1949), and March and Simon's (1958) seminal contributions, research has been exploring the phenomena with a contingency approach (e.g. Van de Ven et al., 1976; Mintzberg, 1978; Keller, 1994; Gupta et al., 1994), envisioning coordination as essentially a matter of structure. As outlined by Okhuysen and Bechky (2009), some scholars investigated the configuration of organizational work with the view that specialization lead to elimination of waste (for example, Taylor, 1916; Chandler, 1962), while others concentrated on the design of management systems that specify exchanges through dedicated structures, roles, and rules (for example, Fayol, 1949; Thompson, 1967; Mintzberg, 1978; Argote, 1982; Gupta et al., 1994; Gittell, 2002). The latter especially suggested that in routine situations coordination would be grounded on standardized processes, whereas in face of unexpected events it would be based on communication and informal interactions (e.g. Argote, 1982; Eisenhardt, 1993). In spite of these contributions, our appreciation of coordination remains partial and limited (Rico et al., 2008). In particular and because it focused on the structural dimension of coordination at an organizational level, contingent approaches underestimated the influence of social and cognitive factors that affect individuals.

These were more recently reckoned as key in coordination processes however (e.g. Weick, 2001; Rico et al., 2008; Foss and Lorenzen, 2009). In particular, the notion that shared cognition benefits interindividual coordination has been pointed out over the last decade (Faraj and Xiao, 2006; Rico et al., 2008; Canon-Bower et al., 1993; Weick and Robert, 1993; Berman et al., 2002; Zohar and Luria, 2003). In this paper, we espouse Cannon-Bowers and colleagues' (1993, 2001) broad view that shared cognition falls into "*four broad categories: task-specific knowledge, task-related knowledge, knowledge of teammates and attitudes/beliefs*" (2001: 196).

Scholars suggested that groups coordinate best when their individual members share knowledge and attitudes that enables them to synchronize their tasks and take appropriate action without having to communicate (Cannon-Bower et al, 1993). More

specifically, in the context of a medical trauma centre, Faraj and Xiao (2006) found for example that knowledge sharing, joint sensemaking, and shared cognition are crucial for coordination in such high-velocity environments. In particular, they insist that "*expertise coordination processes are important for the team because they facilitate the development of a common mental model of patient condition and treatment options. Such processes also enhance performance by ensuring that crucial knowledge is available to those who need it when they need it*" (2006: 1160). More generally, Rico et al (2008) theoretically-based propositions are that sharedness of a team situation model is positively related to team performance because it enables smoother and better coordination. Sharedness, they suggest, is positively related to the team's longevity, internal trust, and efficacy, and negatively related to knowledge diversity. With the study of basketball teams in the NBA, Berman and colleagues (2002) suggest converging conclusions. They found support for a positive relationship between shared team experience and team performance.

Although this positive relationship between shared cognition and coordination is today well established, several lines of research suggest that shared cognition can also impede group coordination in a different way. As Rico et al. observe "*the available evidence remains fragmented and ambiguous*" (2008: 167). For instance, shared cognition can produce pressures towards uniformity that reduced attention to novel alternatives (Levine and Moreland, 1999). As a result, coordination solutions become semi-automatic routines, producing inertia (Lechner and Kreutzer, 2010) and inhibiting adaptation. Berman et al's (2002) study exemplifies this point. Indeed, these authors do in fact record that returns on shared experience are first positive, then decrease and become negative as experience grows. They suspect that "*the effects of knowledge ossification begin to outweigh any benefits of collective knowledge accumulation*" (2002: 27); increasingly shared knowledge drives to rigidity and "*myopia as organizational behavior becomes increasingly routinized in taken-for granted ways of doing things*" (2002: 27). This, in particular, authors argue, is possibly related to the growing inability of the team to respond to changes in the environment. Because of such path-dependency, shared cognition solutions may become obsolete and detrimental, leading groups to inefficient results (Janis, 1972; Levine and Moreland, 1999). For example, incorrect but shared beliefs about how competencies are distributed within the group may lead to suboptimal work assignments and undermine coordination. Somehow similarly Faraj and Xiao (2006) also observed that initial coordination processes based on common mental models are sometimes insufficient to face certain situations. As they exemplify, in trauma centers, sometimes patients do not respond to treatment as expected, they "*do not follow the rules*" (2006: 1167). In such situations, Faraj and Xiao (2006) found that additional information sharing is necessary to "*generate a new collective understanding of the patient*" (2006: 1165).

Overall, evidence is past literature is ambiguous; shared cognition simultaneously enhances and impedes coordination. Our aim in this article is to explore practices shaped *in situ* to handle the ambivalent influence of shared cognition: how do actors take advantage of the values embodied in shared cognition without being hampered by its dysfunctional down side? In addressing that question, the article invites researchers and managers to reshape their thinking of coordination processes as well as the set of incitation and interventions by which those can be improved.

3. METHODS

The article draws on an extreme single case study (Yin, 2003) that we selected as that from which we felt we could "*learn the most*" (Stake, 2005:451): the air squadron "Patrouille de France" (PAF). To investigate our research question, we examined the way the PAF as an organization and its pilot team handle the dual influence of shared cognition.

3.1. Case settings

The PAF is one of the world's oldest military display team, founded as early as 1930's. As a showcase of French Air Force, it performs skilled aerobatic demonstrations with pilots flying their Alphajets no more than two meters from each other (including inverted maneuvers), during a 25 minutes aerobatic show. In these circumstances, perfect coordination between pilots is central to both the overall aesthetics and security (public and pilots) of the show.

However, in addition to the coordination requirements of its specific in flight activity, the PAF also stood out as a pertinent empirical field because of its unique organization. The PAF is small, comprising only 9 pilots: 8 of them (Athos 1 to 8) are dedicated to hold a specific place in the formation. Athos 9 is the one and only reserve pilot, and able to fly any places in the squadron, except the leader position (Athos 1). The reserve pilot is the most experienced. Recruitment at the PAF happens on an annual basis. Each year, 3 new pilots are transferred from operational squadron to the PAF, traditionally but not exclusively on the base cooptation. The three most senior ones also leave the PAF to join back either an operational squadron or a headquarters' position. Therefore the average turnover is high. It is reinforced by the internal rule that each year, each pilot shall occupy a new position, different from that he/she formerly occupied. As a result, each pilot flies only an average one year in a given position in the formation and exits the squadron after two, three or four years.

The PAF annual schedule is organized around two seasons. The show season (the summer season) runs from early spring to mid autumn with an average of 60 exhibitions in ever different locations and conditions. The training season (the winter season) runs from mid-autumn to the end of the winter with some 180 flights: new pilots are integrated, the new program is devised, and figures are discussed and rehearsed. Although pilots are experts (all of them being patrol leaders with more than 1500 hours flying time when they join the PAF), training is intense. Flying an Alphajet within the PAF is very different from flying a fighter aircraft in other circumstances in the Air Force, both technically and socially.

3.2. Sample and Data collection

Based on an ethnographic study, we investigated how the PAF as an organization and its pilot team handle the dual influence of shared cognition. Our empirical material was collected during a 5-months field study conducted at the squadron (based at Salon de Provence, France). We started our study mid-September. At this moment we had the opportunity to meet both senior pilots and new recruits. We built on multiple data sources. First, we conducted formal individual interviews with ex- (2 interviews), current (3 interviews) and new (1 interview) pilots of the PAF. We selected pilots in these three categories in order to be able to grasp potentially different degrees of shared cognition within the team. Interviews lasted about one hour and a half each. They were

all tape recorded, than transcribed. Second, we conducted multiple observations: shadowing during briefings, attendance to debriefings, and to the end-of-season aerobatic exhibits. During these observations, we were not able to conduct video recordings; however we took detailed notes that we complemented with official recordings provided by the PAF. These videos are part of our third data source: we used a variety of videos, audio and archival records available from the PAF. These enabled us to grasp mostly organizational dimensions.

3.3. Data analysis

We transcribed the tape-recorded interviews and field notes gathered through observations. Analysis of these multifaceted data was based on a line-by-line coding. We conducted our analysis and collection processes concomitantly. During the whole process, we also followed an iterative and comparative approach in order to identify regularities and additional field-based necessary inquiries (Strauss, 1987, Miles and Huberman, 1994). The coding process was instigated in a top-down perspective, according to the three main themes derived from the interview guide on the base of ambivalent results in the existing literature: (1) processes through which shared cognition is produced in the PAF, (2) organizational, collective and individual devices used by pilots to nurture shared cognition and (3) potential limits of shared cognition. From these three themes, we produced emerging themes which included a more refined categorization of organizational and team level supports and challenges to shared cognition for coordination.

4.   SHARED COGNITION AND COORDINATION AT THE PAF

Within the PAF, coordination (or "synergy" in pilots' jargon) is the central and everyday concern towards which all efforts are directed. In this regard, developing shared cognition is crucial: mastery of the jet, the program, the figures, the timing, and the position of each airplane in relation to others. Our data indicate that such shared cognition is developed, rested upon, and at the same time challenged at different levels in order to base coordination: the organization and the team.

4.1. Organization-level support and challenges to shared cognition for coordination

Most remarkable in our data is the strong socio-organizational realm in which pilots are immersed. Our data indicate that this organizational-level aspect is a crucial means of developing shared cognition. We even observed that this socio-organizational context formed the background of all other developments. The PAF is a very specific social prestigious group inside the Air Force (regardless of ranks). The social status of the PAF transpires through media discourse. Yet it is also striking on the airbase. Pilots from the PAF wear clear blue uniforms contrasting with the kaki or dark blue color of others. Even though they share the airbase life, their schedule is distinct from that of other pilots. For example, because of their flying and work schedule, they often have lunch together, later than others (interview and observation). They join the mess with about half an hour to an hour delay. However, due to the color of their uniform they do not go unnoticed and everyone regards them with respect (observation). The PAF's buildings on the airbase are distinct and located in a specific area. Corridors are filled with pictures of the glorious squadron's history. Each team is represented, from 1953 to

present, with the pilot's names. On each side of the corridor, pilots have their offices. The offices are attributed according to the pilots' roles in the formation: right, left internal and external together on each side of the corridor, then the solos' office, then the leader and scavenger (Athos 1 and Athos 4, the later flying at the rear in formation aligned with the leader) together (observation). The dedicated briefing room faces the entry, at the other end of the corridor. During our interviews all pilots were also highly aware of their commitment to contributing to the squadron's prestige. They all explained us that as pilots they were part of a history with, above all, a duty to contribute to the PAF. One of the pilots even insisted on the metaphoric power of the term Athos that they use to designate each other (from Athos 1 to 9): "*it's the musketeers. We call each other Athos for a good reason: one for all and all for one. It perfectly illustrates the PAF's spirit*" (interview).

The PAF as an organization has also specific working rules and roles. As the actual reserve pilot insisted, "*each of us has a place, a determined role at the PAF*" (interview). Physical and technical training, behavior and knowledge development are highly codified, both technically and socially. When new recruits joint the squadron in autumn, they nearly turn back apprentices; all pilots insisted that despite their prior experiences on fighter aircrafts, and their all being patrol leaders with more than 1500 hours flying time, they turned back students pilots and agreed "*to star over*" (interview). In the first place, they have to technically become familiar with the way Alphajets are flown and the specific figures to be accomplished. Training and constant rehearsal are therefore essential to develop shared cognition for coordination. The new recruits always occupy the same positions (Athos 2, 3 and 4), close to the leader in formation. Around them, more experienced pilots (namely Athos 5, 6, 7 and 8, in their second or third year at the PAF) form the "*rear box*" (interview) and are in charge of their training.

The winter season (from mid-October to mid-February) also follows a progressive standardized schedule. Pilots (especially new recruits) start by flying by groups of 4 Alphapjets with the previous then with the new solo leader. Then they progressively fly in close formation and in January they start to perform inverted flights with a rhythm of two or three training flights per day. Each flight is briefed and debriefed. Knowledge development is also based on the permanent nourishing and use of the documentation of flying experiences in a database: "the bible" as PAF pilots call it. During the winter season, pilots progressively learn the individual figures and their sorties. All the figures are well described, standardized, and shall be mastered by pilots. Then from individual figures, pilots also have to learn the exhibition program of the year, that is to say the unique combination of some figures. Last, roles are well defined within the PAF in order to ensure that learning and development remain in line with the organization's values and history. In this regard, the role of the reserve pilot is especially important as guardian of traditions. As the current reserve pilot explained us, his role is to be "*the traditions' master*" (interview), in flight and on the ground. During flights (included training), he usually acts as external and expert ground-observer and signals any disturbing detail, from security to positions. On ground his attention additionally goes to behaviors especially in face of civil authorities and third parties (interview). All these values, tight working, learning rules, and roles ensure knowledge sharing at all levels, from values to skills. They are organizational dispositions that foster coordination, through standardization and structure design.

However at the same time, they also form the conditions for permanently challenging sharing. The organizationally imposed turnover is especially important in this regard. At

the PAF, turnover is annual and significant. Each year, 3 new recruits join the squadron and the three most senior pilots leave the PAF to join back either an operational squadron or a headquarters' position. In addition, turnover is also internal with pilots rotating positions: the former scavenger becomes leader, the two internal Athos (3 and 4) become either right external (Athos 6) or second solo (Athos 8). This results in a need to annually re-engage learning and drives attention towards how it is achieved. As pilots explained us, turnover systematically re-questions what could have otherwise been considered as given, from what people do to how they do it. The integration of new members in the squadron is also an annual opportunity to re-asses the rules and routines. It sustains permanent attention towards all details (in flight and on ground).

Overall, our analysis at the organizational level is that the strong and lasting social and organizational setting ensures knowledge sharing for coordination. However, as all pilots reported, the high turnover rule (recruitment and annual rotation of positions) also stands out as essential: it is an organized source of permanent challenge to the organizational arrangements. In fact, it forces the PAF (as an organization) to be highly attentive to many aspects, from the image it carries to the pertinence of its internal rules and routines.

4.2. Team-level support and challenges to shared cognition for coordination

Our data further indicates that parallel centripetal and centrifugal forces are at play at the team level in combination. The PAF is a small group, with only 9 pilots. We observed that internal cohesion is both very strong and valued. In particular, the development of tight interindividual relationships is important. Pilots literally live together most of the time. As one of them told us: "*We are always together at the PAF, we travel together. It's really different from other squadrons where […] you cannot be friend with everyone. At the PAF, there is a lot of sharing. We build strong links on earth that will also be expressed in flight*" (interview with pilot).

At the team level, the relational aspect is even a crucial cooptation criterion for new recruits. New pilots are pre-selected by military authorities among candidates according to their flying experience. But most important, as pilots told us, they are finally chosen by the PAF current team after individual appreciation of whether they will be good mates, people with whom relationships will be strong. Pre-selected pilots spend a full day at the PAF with the current team. They attend a flight briefing and then fly in back seats. However, during our interviews, PAF pilots insisted that this was not the most important part of the cooptation process because in the end selection in not technical. They all reported (interviews) that the most important part of the process is when they practice sports together, discuss, and answer the questions asked by the current team during individual interviews. Whether candidates will be able to belong or not makes the difference, and it is the criterion after which the current team makes its choice on the base of a vote. Indeed, tight relationships base mutual trust; a fundamental aspect as each pilot is ensured that alike him/her, others will do whatever it takes to "*hold their position*" with rigor in the formation in flight (a motto at the PAF). Not only does the aesthetics of the show depend on it, but also the pilot's and the public security. Mutual trust is therefore essential. It is developed in the team from day one and sustained by the particular organization of the PAF (e.g. dedicated building, specific schedule…). As a pilot summarizes it: "*the fact that people have good relationships on the earth automatically finds expression in the air*".Yet, all pilots warned us that internal team cohesion can at times be a trap. They especially referred to the danger of being "*trapped*

in a tunnel" (interviews), either because they share such a "*strong will to go further*" (interview) or because they could become "*too self-confident*" (interview).

In this regard, all pilots insisted that the annual turnover in the team was the major source of permanent alertness because of the constant learning it implied. Not only has the team to integrate new pilots, but current pilots also have to fly new positions. As one of them put it, it's a start over: "*each year, every one of us has to learn again. It's a true reassessment for everyone. […] Learn a new position each year and achieve the same level of performance*" (interview). Current pilots in particular must learn new ways, new perspectives on the formation. They cannot rest on what they did the year before, the way they did it, nor the teammates with whom they flew. The conditions change, their roles change, some of their mates change. The shared cognition that was developed the year before turns insufficient. In the first place, this implies experiencing and learning new positions in the formation; that is to say both new tasks and new ways of experiencing flights for standard figure, because of the difference in position. Second, this also implies learning how other PAF pilots will hold their position. Turnover brings diversity to the team. Individual pilots' trajectories and backgrounds are different. Each pilots has his/her own personal sensations and manners (especially visible during briefings when they rehearse their flight, eyes closed, focused on their movements). One of the pilots we interviewed precisely illustrated this point: "*Coordination highly depends on the leader. It's the reason why the leader never changes (during the season). This year she [the 2010 leader was a woman] had her ways of piloting and announcing over the radio. The rest of us, we follow her rhythm. We are used to how she does it. We try to pilot the same way to produce an impression of fluidity. It's a matter of training and rehearsal […] It's really the sound of her voice. […]. The way she starts turns, because she maybe stars turns faster than the previous leader*". Third, turnover and diversity are also occasions for the devising of a new exhibition program, a new combination of some figures that has to be learnt by the team. Each pilot has his/her own experience and contributes to suggesting figures or modifications to the program, or to how it can be performed in a specific context. This especially true for the leader and solo leader, because they are in charge of devising the unique annual aerobatic program (meaning that each year, the program changes). Last, as pilots explained, this reinforces sustained attention towards novel situations during flights. In this regard, mutual trust and vigilance are in fact of equal importance. As a pilot insisted: "*mutual trust, verifications and vigilance are not mutually exclusive*".

Overall, our data indicate that at the PAF organizational-level and team-level effects do at the same time sustain the development of shared cognition for coordination and guard against potential rigidities.

5. CONCLUDING DISCUSSION

Based on an ethnographic study at the air display squadron "Patrouille de France" (PAF), we investigated dual influences of shared cognition on coordination, and more specifically how coordination might benefit from shared cognition while avoiding its pitfalls. Past literature in fact exhibits mitigated results as to the role of shared cognition for coordination. Some studies put forward that groups coordinate best when their members share knowledge and attitudes that enables them to synchronize their tasks and take appropriate action without having to communicate (Cannon-Bower et al, 1993, Rico et al., 2008 for example). Others outlined the dangers of cognitive ossification for coordination that drives to producing uniformity, reducing attention to novel

alternatives, generating semi-automatic routines, and inhibiting adaptation (Berman et al., 2002; Lechner and Kreutzer, 2010; Levine and Moreland, 1999 for example).

We show that both at the organizational and team levels centripetal and centrifugal forces operate in combination to ensure high shared cognition and guard against ossification for coordination. At the organizational level, strong organizational rules, design, and structure do foster shared understanding for coordination while designed annual turnover involves permanent learning with the integration of new pilots. At the team level, challenging shared cognition is reinforced by internal turnover, which implies continual learning for everyone, while high team cohesion ensures the enduring shared cognition necessary to coordination.

Our results contribute to advancing the debate on shared cognition and coordination by pointing at balancing effects, especially between shared cognition and turnover. We show that in fact both elements are important for coordination. While taken in isolation each of these can first prove beneficial and next turn to bear more negative effects on coordination (for example Berman et al., 2002), we show that it is the combination of these elements that enables achieving balance enduringly favorable to coordination. Past coordination literature have barely addressed such combination effects, and studies on small groups dynamics even tended to focus on isolated influences. Only a few studies hinted at possible compensations; for example, in their quantitative study of teams performing joint replacement procedures in a teaching hospital, Reagans et al. (2005: 880) suggested that a relationship seemed to exist between turnover in team and team composition, the later being able to compensate for the loss of knowledge generated by the former. This quantitative-based together with our qualitative-based conclusions converge to suggest that examining influences in combination is promising avenue for further research on shared cognition and coordination.

Our study also highlights that the equilibrium between centrifugal and centripetal effects of shared cognition on coordination is achieved at two levels in combination: the organization and the team. Such relational view advances the understanding of the relationship between shared cognition and coordination because it introduces a new perspective in addition to those usually put forward in coordination literature. Coordination literature is often presented as being structured around a fundamental opposition between more formal and more informal coordination. Formal coordination refers to more or less explicit formal dispositions such as plans, rules, design, and communication. In past literature these dispositions were mainly associated with organization-level preoccupations, and developed under a contingent approach of coordination (Bechky and Okhuysen, 2009 for example). In opposition to this view, informal or more implicit coordination processes such as joint sensemaking or shared mental models (see Rico et al., 2008 or Faraj and Xiao, 2006 for example) were highlighted later, and mostly at a group or team level. Because they developed as a response to the overly macro approach of more ancient researches, a vast majority of these later studies addressed intra-group or team coordination without clearly accounting for organizational influences. However, our results suggest that such binary opposition might be in fact reframed.

In the first place our results suggest that divergences in past literature with regard to the relationship between coordination and shared cognition may stem from these mixed influences. For example, building on extensive review of past literature, Rico et al. (2008: 171) propose that longevity is positively related to shared cognition and therefore favorable to better coordination. In contrast, these authors carry on (2008:

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172), knowledge diversity is negatively related to shared cognition and therefore detrimental to coordination. In this regard, our results suggest that it is in fact organizational (not team) longevity that has a positive influence on coordination throughout the strong socio-organizational context it contributes to forming. It enables the development of enduring understanding of the organization's task that is crucial for coordination. It also forms the condition for the successful integration of newcomers. In addition, and because of organizational longevity, we suggest that team level diversity is also beneficial as it guards against inertia or poor adaptation (Lechner and Kreutzer, 2010; Berman et al., 2002, for example).

In the second place and more generally, our results highlight the complementarily between interrelated levels whereas past literature tended to focus on one or the other thus implying that they played in opposition or as substitutes. Team level implicit and informal phenomena are based on organizational explicit and formal dispositions. The later sustain the development of the former. In return, organizational dispositions alone are insufficient to address coordination, and team-level dynamics are complementary. Overall, our results indicate that rather than being merely a matter of organizational or team-level phenomena, coordination is relational. On this base, further examinations of coordination should beneficially consider both levels of analysis and their relationships.

Last, our results point at time effect in the relationship between coordination and shared cognition, empirically confirming Rico and colleagues' (2008: 178) theoretical insight that time matters. However, while these authors stick to a team level analysis, our study points at different temporalities at different levels. Over the long term, organizational arrangements provide lasting templates for learning and behaviors and ensure convergence based on shared values and skills. When they join the organization, actors are immersed in and influenced by this lasting setting to which they adhere. Over the short to medium term and against this setting, actors further develop team-level specific arrangements and relationships that impact coordination as a practice. However our data set was too focused in duration to enable further exploration of these aspects. Additional research might fruitfully address this question, with, more longitudinal studies.

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