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# From boat to bags: The role of material chronotopes in adaptive sensemaking

Geneviève Musca Neukirch ● Linda Rouleau ●  
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**Abstract.** In following a material turn in communications, this paper explores how adaptive sensemaking in an extreme context is materially framed and reframed through both time and space. By drawing upon an ethnographic study of the Darwin Expedition, the paper examines in fine-grained detail what Weick (1993) would call a "cosmology episode": during Days 9 and 10 of this expedition, climbers felt that their universe was no longer rational or ordered. A discursive analysis reveals that the "boat" and "bags" had become two central "material chronotopes", through which meaning-making was being collectively reframed once the sense had collapsed. This work assesses the accounts surrounding both objects and moreover explains their roles in prompting the expedition team to reframe core meanings and enact a radical shift in sensemaking. The conclusion discusses the contribution of chronotopes in frame-shifting and the importance of focusing on the central objects structuring the collective sensemaking process in order to yield a better understanding of the role of materiality in an extreme context.

**Keywords:** adaptive sensemaking, chronotope, materiality, linguistic analysis, extreme context

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## INTRODUCTION

The literature on sensemaking in an extreme or crisis context typically focuses on several cases involving the failure to reframe a situation as unexpected events unfold (Colville, Pye & Carter, 2013; Cornelissen, Mantere & Vaara, 2014; Weick & Roberts, 1993; Weick, 2010; Weick, 1993). In an extreme context, major breakdowns in meaning are likely to occur, thus raising challenging issues for sensemaking (Maitlis & Sonenshein, 2010). The sensemaking process proves to be decisive both in reconstructing meaning around a common framing of the situation and in accepting and implementing a radical shift (Maitlis & Sonenshein, 2010; Weick, 1988, 1995). Weick's seminal paper on the Mann Gulch disaster, published in 1993, provides one of the best known examples of such a situation. In their response to this disaster, firefighters found it extremely difficult to drop the heavy tools they were carrying, even though doing so would have allowed them to flee and survive. Since the situation was very fluid and becoming increasingly ambiguous, a tremendous breakdown in meaning had occurred, leaving firefighters unable to communicate or construct a joint account of events as they were happening due to the presence of thick smoke and loud noise. By illustrating the inability to adapt to unexpected events, as exhibited by their reluctance to drop the tools, Weick (1993) identified a central problem in sensemaking. However, he and most subsequent researchers delving into

sensemaking persist in explaining such an inability by citing cognitive reasons, and thus overlooking the symbolic roles ascribed to "tools" or materiality by individuals in the process of reframing meaning. In their review of sensemaking research, Maitlis and Christianson (2014) urged researchers to advance this line of query through exploring the role of the material objects used as cues in a sensemaking process. More specifically, the present paper focuses on the way these cues are embedded into both space and time. Such is precisely the goal of this paper.

In pursuing this interest for materiality in communication studies (Ashcraft, Kuhn & Cooren, 2009; Orlikowski, 2007) and how it participates in sensemaking, we are proposing herein to investigate a reframing situation that plays out in an extreme context by advancing the notion of "material chronotope" in reference to the notion of chronotope developed by Bakhtin (1981), in order to explain the deep entanglement between time, space and materiality. We use this notion to discover how team members of an expedition reframe their world subsequent to a series of unexpected events and wind up agreeing to enact the new frame. According to Bakhtin (1981), a chronotope (literally, time = *chronos* plus space = *topos*) refers to a unique configuration of time and space used to organize a specific literary genre; as such, this particular configuration offers a way of understanding the world. This notion has already been introduced in management studies to explain how change-related meanings transform over time (Boje, Haley & Saylor, 2016; Lancione & Clegg, 2013; Lorino & Tricard, 2012; Musca, Rouleau & Fauré, 2014; Vaara & Pedersen, 2013). The proposal here is to extend the focus to the material dimension of this Bakhtinian notion of chronotope, in emphasizing it as a material entity and thus setting the stage for "the fusion of space and time". For this reason, we employ the term "material chronotope". Moreover, in keeping with Bakhtin, we analyze how this material chronotope is configured through discourse and especially how it organizes discursive genres. In relying on this notion, our aim is to understand how a project is framed and reframed through discourses.

Our study draws upon a real-time, *in situ* ethnographic study of a non-commercial French mountaineering expedition, i.e. the "Darwin Expedition", whose objective was to achieve the first-ever crossing of the Cordillera Darwin range in Patagonia (some 150 km long). The six-week expedition took place in September and October 2009 (lasting over 40 days in all). The entire expedition was jeopardized by a series of unexpected events under extreme conditions (i.e. where any single deviation had potentially life-threatening consequences). Through a linguistic analysis of the texts and discourses produced during this expedition, namely the logbook produced by the team and the conversations held among team members during an episode (Days 9 and 10) when sense had collapsed, we show how two material objects - the boat and the bags - were central to the process of framing and reframing meanings throughout the expedition. At the end of Days 9 and 10, the alpinists decided to "drop" the boat that had served as their base camp, thereby ensuring their safety and enabling them to resupply. They actually packed their bags (having first reassessed the type of gear and equipment required for a revised crossing strategy) and disembarked from the boat. The transition from "dropping the boat" to "let's pack our bags" allowed team members to initially reframe the meaning of the expedition around different goals and objectives.

This paper provides three contributions. First of all, we expand the role of materiality to serve as a cue for adaptive sensemaking in an extreme context (Clegg, Pina e Cunha, Rego & Dias, 2013; Guthey, Whiteman & Elmes, 2014; Hydle, 2015; Tuana, 2008) both by emphasizing the temporal and spatial dimensions and by examining objects to which significant influence on collective action is given. The second contribution complements existing research in the area of management and organizational studies on chronotopes (Boje, et al., 2016; Lorino & Tricard, 2012; Musca, et al., 2014; Pedersen, 2009; Vaara & Pedersen, 2013) by advancing the notion of material chronotope through a linguistic analysis of discursive genres and conversational practices. Third, we highlight the process of frame-shifting in an extreme context (Colville, et al., 2013; Cornelissen, et al., 2014; Dunbar & Garud, 2009) and reveal the temporal discontinuity of such processes.

This paper has been divided into the following parts. We begin by reviewing the sensemaking literature in an extreme context and developing the notion of a "material chronotope". The methodology is described next, followed by a presentation of our findings. The paper concludes by discussing the role of chronotopes in frame-shifting and the importance of identifying the central objects structuring the collective sensemaking process in order to better understand the role of materiality in extreme contexts.

## **ADAPTIVE SENSEMAKING AND MATERIALITY IN EXTREME CONTEXTS**

Major environmental disruptions and changes raise the challenge of adaptive sensemaking (Kaplan, 2008; Knight, 1921; Weick & Sutcliffe, 2007). Maitlis and Christianson (2014: 67) described the process of adaptive sensemaking in the following terms: "A process, prompted by violated expectations, that involves attending to and bracketing cues in the environment, creating intersubjective meaning through cycles of interpretation and action, and thereby enacting a more ordered environment from which further cues can be drawn." In extreme contexts, adaptive sensemaking involves developing plausible meanings through the creation of narratives of what is actually happening (Maitlis & Sonenshein, 2010: 552), with these narratives combining new cues and emergent frames (Weick, 1995: 110), disseminating meaning and prompting action (Gioia & Chittipeddi, 1991; Maitlis & Sonenshein, 2010; Weick, 1988, 1995). Frames correspond to the "principles of organization that govern the subjective meanings [actors] assigned to social events" (Goffman, 1974: 11, quoted from Cornelissen & Werner, 2014: 197). An adaptive process of sensemaking takes place when moving from one frame to another.

When studying sensemaking in extreme contexts, contemporary studies are beginning to seriously examine the role of materiality in the meaning-making process over time. As Weick (1996) demonstrated 20 years ago, the reluctance of firefighters and others holding jobs of high responsibility (e.g. seamen, fighter pilots, police) to drop the specific tools that constituted a distinctive trademark of their profession could prove to be fatal. In extreme contexts, technical systems, tools, procedures, etc. all play a crucial role, perhaps more than in conventional settings since the interdependence between these material objects and artefacts, as well as human input, can make the difference between life and death (Shattuck &

Miller, 2006). Nevertheless, materiality in crisis and organizational sensemaking (Stigliani & Ravasi, 2012) is a recent concern targeted by management and organizational scholars. Generally recognized as incidental or, at best, intermittent in the scholarly description of sensemaking processes, the role of objects in such situations has been understudied. It is increasingly obvious however that objects contribute to the enactment of sensemaking in extreme contexts through tools, architecture, reports, technological systems, and the list goes on.

Even though the research on crisis sensemaking and materiality remains scarce, it does reveal that materiality forms other than the work-related objects and artefacts typically investigated in organizational sensemaking studies have been taken into account (e.g. magazines, images, sketches used by designer teams, Stigliani & Ravasi, 2012). For example, in addition to physical artefacts or objects used by police officers (guns, equipment, videos and films), Cornelissen, et al., (2014) broadened their vision of materiality by assessing the physical environment and the embodied acts of gesturing, in order to explore the role of materiality in escalating commitment around a false interpretation sequence. Clegg, et al., (2013) assessed how mundane objects intervene as a genocidal process unfolds (e.g. chains, iron beds, needles, books). Tuana (2008), along with Whiteman and Cooper (2011), urged extreme context researchers to incorporate both the physical and natural environment, composed of rocks, ice, animals, trees, vegetation, etc.

Moreover, the research conducted on crisis sensemaking and materiality has addressed the "mediating" role of materiality in sensemaking processes and practices in the presence of extreme contexts. In reexamining the Stockwell shooting, Cornelissen, et al., (2014) suggested that materiality allows for "anchoring" or providing concrete evidence that corresponds to the language used and emotions felt surrounding the framing of Jean-Charles de Menezes as a terrorist suicide bomber. These authors proposed the notion of "material anchoring" for the purpose of categorizing the role of materiality in sensemaking. By confirming the meanings evoked and interpreted, materiality in this case contributes to reinforcing a non-adaptive sensemaking response to an anti-terrorist police operation. In comparing an ethnographic account in the Subarctic with the Mann Gulch disaster, Whiteman and Cooper (2011) posited that the inclusion of actors in their ecological environment stimulates their sensemaking, while excluding their ecological surroundings can lead to non-adaptive sensemaking. In studying the Columbia Shuttle flight and conflicting logics at play within NASA before the explosion, Dunbar and Garud (2009: 398) proposed considering "sensemaking as emerging from the interactions of different pieces of organizational knowledge distributed across artefacts, people, metrics and routines". According to these authors, it is the "distributed" nature of sensemaking or what they call the "indeterminacy of meaning" in complex technological systems that explains the difficulty for individuals, teams and organizations to adapt to unexpected and extreme events.

In this body of research, materiality might be a cue that stimulate convergent or divergent interpretations and offer new opportunities for adaptation. This paper is intended to continue along such an approach (Putnam, 2015) and extends the notion of materiality as a cue for adaptive sensemaking. Furthermore, other researchers working on extreme contexts and examining materiality have emphasized the temporal and spatial dimension inherent in materiality under extreme conditions. For example, Tuana (2008: 193) suggested that Hurricane Katrina "is

emblematic of the viscous porosity between humans and our environment, between social practices and natural phenomena". The metaphor of "viscous porosity" addresses the weight involved in nesting materiality, time and space. Clegg, et al., (2013) analyzed the Cambodian genocide of the 1970's and demonstrated how banal objects create "material spaces" that help normalize the abnormal. This line of research therefore provides a forum for addressing the issue of materiality from the standpoint of time and space in sensemaking.

To better understand the sensemaking process in an extreme context, further exploration is required of how new framings collectively emerge and might favor alternative courses of action. Such an exploration however necessitates better comprehension of the role of materiality in sensemaking and of how plausible connections among temporal and spatial interpretations unfold, even if they are difficult to articulate. We have relied on this perspective to borrow the notion of "chronotopes" developed by Bakhtin (1981).

## **CHRONOTOPES, SPEECH GENRES AND MATERIALITY**

The notion of chronotope has been defined by Bakhtin (1981: 84) as follows: "*We will give the name chronotope (literally, 'time space') to the intrinsic connectedness of temporal and spatial relationships that are artistically expressed in literature*". From Bakhtin's perspective, the notion of chronotope is a unique configuration of time and space that organizes a specific literary genre, such as: Greek romance, adventure novel, biography, chivalric romance, Rabelais-inspired novel, or idyllic novel (Bakhtin, 1986). This "fusion of space and time" is materialized in a tangible entity. For instance, he identified « the road » as the chronotope for adventure novels. Even though it could be fictional, the road is definitely a tangible entity configuring time and space in a way that produces the adventure novel genre. According to Bakhtin (1981), one way of defining and stimulating a literary speech genre is to structure it around some chronotope. He pointed out: "*The chronotope in literature has an intrinsic generic significance. It can even be said that it is precisely the chronotope that defines genre and generic distinctions, for in literature the primary category in the chronotope is time.*" (Bakhtin, 1981: 84-85, note: we added the underscore). Moreover, the chronotope serves to define the genre by means of organizing not only the subject but also the characteristic composition and style features accompanying each genre: "*We understand the chronotope as a formally constitutive category of literature*" (Bakhtin 1981:84: note: we added the underscore). For instance, in the adventure novel, the road shapes the time and space embedded in the encounters composing the novel, from the standpoint of: the dominant adventure theme (e.g. the road sets the stage for the encounters), the novel's internal outline (organized as a series of successive encounters), and the linguistic forms employed (e.g. using connector words to mark a linear temporal sequence, like *then*).

Scholars in management and organizational studies who apply the notion of chronotopes have either referred to the chronotopes listed by Bakhtin (e.g. the road, the castle, the parlors and salons, a provincial town, threshold) or proposed other chronotopes in order to explore how time and space play a role in diverse managerial and organizational processes. For example, Vaara and Pedersen (2013) offered a framework for investigating strategic narratives based on the six genres and chronotopes (e.g. adventure of everyday life/the road) identified by Bakhtin. They propose a "literary time" perspective and suggest observing how specific

combinations of time and space are constructed in strategic narratives. Haley and Boje (2014) and Boje, et al., (2016) drew upon these same chronotopes, which are considered as the building blocks underlying narratives and antenarratives in the managerial discourse of change. This approach made it possible for the authors to display the heterogeneous nature of these strategic and organizational narratives as regards space and time. Other scholars have highlighted the existence of alternative chronotopes specific to the organizational discourse under analysis. Such is the case with Lorino and Tricard (2012), who indicated that when the dominant organizational chronotope is destabilized by actions that transgress narrative boundaries, some organizational actors might then "scream" in order to reaffirm and defend the time-space frame constituting their professional identity. Lancione and Clegg (2013) identified 29 generic organizational chronotopes shaping the business school they were studying. Musca, et al., (2014) showed how a specific chronotope (i.e. the "crow's flight path") provides a practical means for calculating the distance traveled relative to the time frame available for an expedition.

These works have highlighted the interest of the notion of chronotopes for management and organizational studies. However, managerial chronotopes draw upon the literary genres studied by Bakhtin yet do not necessarily cover all types of discourses enacted in organizations. On the other hand, organizational chronotopes overlook the fact that the Bakhtinian notion of chronotope is intimately tied to speech genres. According to the Bakhtinian perspective, chronotopes are grounded in the discursive traces of spatiotemporal orientations that organize both the content and form of a specific speech genre. Speech genres are defined as: "*relatively stable types of [...] utterances*" (Bakhtin, 1986:60), developed through social spheres of activity and therefore associated with a specific social function. These speech genres are "*diverse and boundless because the various possibilities of human activity are inexhaustible*" (Bakhtin 1986), such as "*everyday narration, writing (in all its various forms), the brief standard military command, the elaborate and detailed orders, the fairly variegated repertoire of business documents... and the diverse world of commentary (...)*" (Bakhtin 1986:60). Since the speech genres of managerial contexts differ from the literary genres investigated by Bakhtin, chronotopes in managerial contexts might differ from those highlighted by Bakhtin. Their identification would require a discursive analysis of the genres used in organizational studies.

Another specificity of Bakhtin's notion of chronotope is the fact that chronotopes are not mere configurations of space and time: they have the status of material objects and artefacts. Bakhtin (1981:84) stated: "*In the literary artistic chronotope, spatial and temporal indicators are fused into one carefully thought-out, concrete whole.*" In fictional genres, objects and artefacts are fictional, while in the non-fictional genres typical of organizations, they might be real objects or artefacts. For this reason, we are proposing the notion of "material chronotope". These objects are tangible, yet by virtue of organizing a speech genre, they possess a semiotic value: this discourse has imbued them with meaning. As such, material chronotopes do participate in the sensemaking process: they orient actors in space and time, in addition to enabling or restricting their sensemaking practices.

This paper will thus explore how material chronotopes constitute the building blocks for reframing meanings in an extreme context. We are seeking herein to answer the following question: How adaptive sensemaking in an extreme context materially framed and reframed through both time and space? More specifically, we wish to explore the role

of material chronotopes in frame-shifting, in a context where the meaning of a situation is under threat. This question will be addressed by analyzing the discursive practices surrounding the Darwin Expedition, during which the initial frame faltered and was replaced by a new frame.

## RESEARCH SETTING AND METHODS

Our study is based on an abductive research design (Alvesson & Kärreman, 2007; Locke, Golden-Biddle & Feldman, 2008). Abduction refers to a form of reasoning that seeks to shape surprising facts into a new hypothesis (Locke, et al., 2008; Peirce, 1958). Abduction therefore fits with this exploratory type of research in attempting to explain how adaptive sensemaking in an extreme context is materially framed and reframed through both time and space. To capture the role of materiality in the sensemaking process as it unfolds (Kaplan & Orlikowski, 2013; Langley, Smallman, Tsoukas & Van de Ven, 2013), we have drawn upon an ethnographic method: "being there" is the best way to understand the role of objects and micro-practices through which a group enacts a radical shift in sensemaking. This *in situ* perspective enables extending beyond a *posteriori* reconstructions and observing in real-time: how actors actually construct and negotiate interpretations, their links with action and materiality, and how these processes evolve over time (Kaplan & Orlikowski, 2013). Moreover, "being there" gives researchers the opportunity to better understand how individuals make sense of changing ecological conditions (Whiteman & Cooper, 2011), which is especially important in extreme and very rapidly-evolving contexts with potentially life-threatening consequences.

The present case study involves conducting a non-commercial mountaineering expedition under extreme conditions. The team faced a situation of isolation in a setting where the consequences of actions and decisions could be critical, even life-threatening (Hannah, Uhl-Bien, Avolio & Cavaretta, 2009). The Darwin Cordillera mountain range targeted by this expedition is located in the "furious fifties" (latitudes) and only accessible by boat across a particularly rough sea. The objective of the expedition was to achieve the first-ever crossing of the Cordillera range (approximately 150 km long), one of the last unexplored areas of the world in these latitudes. The Cordillera is located some 150 km "as the crow flies" from Punta Arenas and could only be accessed by boat in crossing very choppy waters. Complex technical difficulties, combined with very hostile climatic conditions, had prevented previous expeditions from completing the crossing. This case study is appropriate for several reasons. First, a mountaineering expedition constitutes an extreme case (Yin, 1984) and one carried out in an extreme context (Hällgren, Rouleau & de Rond, 2018). Facing tremendous (and as yet unknown) mountaineering difficulties, as well as maritime storms and violent weather, the expedition had to cope with numerous unexpected settings and events (Söderholm, 2008; Weick & Sutcliffe, 2007). Moreover, this unique phenomenon was on display throughout the duration of the entire expedition duration. Second, our research benefited from focusing on a project team (Hällgren, 2007) assigned the objective of traversing a specified goal space (i.e. mountain range) within a specified time frame. Third, this expedition features a moment of radical shift, in this instance Days 9 and 10, which drew our attention to the role played by the boat in the collective sensemaking



process<sup>1</sup>. Fourth and last, since the scope of this expedition is quite limited, i.e. involving a team operating in very close quarters (boat, various base camps, mountain climbs) for a predefined period (40 days), we were able to collect data in real time during all expedition phases, by combining a longitudinal study with a real-time *in situ* ethnographic study over the six-week period (Fasche & Chia, 2009; Van Maanen, 2006, 2011; Yanow, 2009).

## DATA COLLECTION

Data were collected during three expedition phases, namely: preparatory (autumn 2008 - summer 2009); expedition (six weeks in autumn 2009, including the radical change episode); and post-expedition (extending into 2011). Table 1 provides an overview of the compiled dataset.

Phase	Recorded interviews	Other audio recordings	Videos	Participant observations	Documents
Preparatory (2008 - autumn 2009)	All mountain guides + the expedition leader (10)	Six team meetings Informal conversations	Team members (2 hours)	- Team meetings + informal discussions - Participant observations <i>in situ</i> with the team leader (one week, research team 1: itinerary, equipment, logistics)	- Emails - Reports - Graphic displays - Maps - Photos
Expedition (autumn 2009)	17 interviews	- Meetings + conversations (90 hours) - Recorded diaries (alpinists and researchers, 50 hours)	Meetings + various situations (80+ hours)	Participants' observations (24 hours a day for 6 weeks), including team activities at the base camp, reconnaissance itineraries and transfer hikes	- Website (Logbook entries) - Maps - Weather reports - Alpinists' and researchers' notes - Photos
Post-expedition	Focused interviews (16)	Conferences, festivals	"The Darwin Expedition" movie (56 min)	- Post-expedition meetings - Conferences - Informal discussions	- Emails - Articles

Table 1 - Overview of the expedition dataset

During the expedition, data collection efforts focused mainly on the day-to-day activities of the expedition leader and team members (in all 18 individuals: the expedition leader, a highly-experienced mountain guide, 9 mountain guides and amateur alpinists, researchers, assistants and the boat crew, see Appendix 1). The researchers also relied on direct observations, note-taking, audio/video recordings, semi-structured interviews, logbook entries and radio transmissions with the alpinists during their time in the Cordillera range. The alpinists were assigned individual tape recorders or notebooks and were asked to spend time each day answering three questions: 1) What happened today?, 2) How did I feel during the day?, and 3) What do I expect to happen tomorrow? During all three phases, the researchers compiled a variety of documents related

1. In a previous article by these same authors, we studied the discursive practices that enabled this team to reconstruct meaning during the given two-day period, in exposing the various formats inherent in such practices. Our goal here is to explore the role of time and space on the one hand, and objects and artefacts on the other, within adaptive sensemaking microprocesses in an extreme context.

to the expedition, in order to complete the dataset. All four embedded researchers were involved in data collection throughout the expedition; they lodged with the alpinists at various base camps nearly every night (except for one week when the alpinists remained in the Cordillera without returning to camp). The researchers worked in two pairs of two, with each pair conducting three weeks of observations. The first author of this paper was part of the pair that recorded observations and interactions during the first three weeks (Days 1-21). She was with the alpinists throughout the episode analyzed herein (Days 9-10) and therefore could log direct observations. "Being there" as the alpinists experienced a breakdown of sensemaking and struggled to reconstruct meaning, while experiencing for herself the difficulties of making sense of the situation, both helped her focus attention on what was at stake and furthered her understanding of the reframing process. The second author was embedded with the other pair and shouldered responsibility for recording observations during the second part of the expedition: her participation thus made it possible to observe the consequences of the particular episode.

## DATA ANALYSIS

Once an exhaustive, reliable and transferable database had been compiled, the data underwent an iterative analysis. We began by developing an account of the case study along with a detailed chronology of the events playing out at different times in distinct spaces. We noticed that Days 9-10 were crucial to the way the expedition unfolded. In Weickian terms, we concluded that this "cosmology episode" involved a shift in sensemaking: the project seemed to fully lose its meaning and was entirely reframed during these two days (with a complete change of itinerary, type of crossing, direction, difficulties and rescue possibilities). More importantly, the alpinists were forced to leave their boat during this episode, and we were struck by how difficult it was for them to pack their bags in order to leave the boat.

We assembled a team of researchers from the fields of management and linguistics and then turned our attention to the role of materiality in sensemaking through an in-depth linguistic analysis<sup>2</sup> of the data from the perspective of Bakhtin's notion of chronotopes. For this analysis, we selected two data categories: recordings of conversations held during these two days, and logbook posts published on the website both as the episode was unfolding and over subsequent days. The conversations offered a setting in which change was discussed and accepted. The Logbook, written as a collective effort throughout the expedition, provided a running account and directly contributed to sensemaking before Days 9 and 10, during the two-day episode and then afterwards. We conducted an analysis of both the structure and organization of the conversations and Logbook entries (words, morphemes, syntactic structures analyzed in relation to their discursive functions) composing these discourses. The analysis did not solely concentrate on the content being conveyed: the way this content is presented and appears in the discussion, combined with the precise forms used to convey content and the overall discourse structure, were also analyzed using discourse and text analysis methods available in the field of linguistics. We considered the form of utterance in relation to the context of its production and multiple embedded uses. The structure and organization of conversations and logbook entries were analyzed at various points in time throughout the expedition. Three kinds of linguistics

2. This analysis includes semiotic and pragmatic dimensions: in that sense, it corresponds to what Bakhtin considered as being not mere linguistics but "trans-linguistics" (Bakhtin, 1984:181).

analyses were conducted: 1) modalities for constructing discourse objects; 2) structures characterizing the genre of observed texts; and 3) attributes related to temporal and spatial organization.

#### CONSTRUCTION OF DISCOURSE OBJECTS

To fully grasp the chronotope shift (from boat to bags) during Days 9 and 10, we examined how the various referenced objects and individuals were introduced into the discourse and how they were related to one another. This analysis relied on the notion of a discourse object (Grize, 1990; Sitri, 2003), which can be defined as the topic of discussion: this object is the point being raised by speakers. From a linguistic perspective, this object can be identified by specific signs explicitly indicating the topic (*what's important here is...*, *as regards...*, etc.). The key here is that these objects proposed for discussion can be retrieved as the discourse ensues, inasmuch as they are potentially reworded, transformed and reclassified. This collective classification-reclassification effort is apparent when formulating constructions like: *it's actually this, meaning that*, and so forth. Such classification processes contribute to building and modifying meaning. From a methodological standpoint, this classification-reclassification analysis, similar to other potential methods (e.g. semantic network analyses (Cornelissen & Werner, 2014)), displays how shared frames emerge and assemble during interactions (Goffman, 1974; Tannen, 1985) while avoiding "the reification of frames" (Cornelissen & Werner, 2014: 219). These various classifications induce different action sequences (e.g. "10 o'clock fire" (Weick, 1993)). With such discursive objects, we are able to follow the recommendations of Cornelissen & Werner (2014: 219) by "moving closer to the action at a micro-level and studying the ongoing and interpretive processes of framing and meaning construction across actors and across time". The point of view adopted herein is close to that favored by Whittle, Housley, Gilchrist, Mueller & Lenney (2015), who foresaw classification as a discursive activity contributing to strategic change. As indicated further below however, our attention will be focused on the linguistic operations that, through discourse, produce the reclassification.

#### CHARACTERIZATION OF THE TARGETED SPEECH GENRES, I.E. STRATEGIC CONVERSATIONS AND LOGBOOK POSTS

In accordance with the analytical guidelines proposed by Bakhtin, we sought to reconstitute the specific genres embodying these discourses, i.e. the logbook is associated with a well-identified genre featuring many examples and models. We analyzed these models along the lines of the theory of narrativity (Genette, 1980 [1972]). We also observed the words used to label such text (Mellet & Sitri 2010). "Logbook", which corresponds to "*Journal de Bord*" in French (the expedition team's working language). This approach led us to diagnose some changes regarding the logbook genre, specifically in light of the episode under observation. Following Bakhtin's line of analysis, we attempted to characterize those chronotopes capable of depicting and outlining this logbook genre.

## UNDERSTANDING HOW TIME AND SPACE ARE PERCEIVED THROUGHOUT THE EXPEDITION AND BUILT OR REBUILT THROUGH DISCOURSES

We systematically recorded the vocabulary used to designate time and space in the logbook, as well as the time stamps used on verb conjugations; we observed syntactic phrasing that tended towards either narrative (progressing over time) or descriptive (commenting on spaces). We also took into account subjective indices that reveal whether time and space are organized around subjective points of view or around events and objective landmarks. The methodology used herein models the discourse structure initiated by Benveniste (1970/2014) under the banner of the theory of enunciation, when he proposed differentiating between what he called "*discourse*", organized around a subjective point of view, and "*histoire*" (or story), organized around the events being related.

Beyond these linguistic analyses, the ethnographic analysis was based on the first and second authors' contributions to the data collection process. The extensive discussions held with the alpinists and other researchers *in situ*, plus the first author's previous knowledge of alpinism and mountaineering yielded a detailed account of the stakes involved during the expedition and of what actually was taking place in the conversations and logbook entries analyzed. More specifically, this approach served to clarify what kinds of frames were being successively updated. As recommended by Kaplan (2008: 734), we "identified frames from statements made in interviews, interactions and documents". We thus tracked the frames used to organize sensemaking, both before and after the change (pre- and post- expedition interviews, documents), as well as the step-by-step procedure of the reframing exercise itself. Moreover, this interpretive step enabled us to correlate the ongoing process of meaning construction in the given situation with actual actions taking place.

## **FINDINGS: THE ROLE OF MATERIALITY IN ADAPTIVE SENSEMAKING**

The findings of our analysis are based on the three periods of the expedition, during which two dominant artefacts, i.e. the boat and the bags articulating multiple dimensions of time and space in the logbook, operate as cues in the transition from one frame to another. During the first period (marked by unsuccessful attempts to navigate towards the Cordillera, Days 2 through 8), we show how the logbook discourse was organized around one material chronotope (the boat) in the initial frame of "Great explorers". The second period encompasses Days 9 and 10 and describes the frame faltering and discursive co-construction of a new frame through conversations between team members. We will show how the transition from one material chronotope (boat) to another (bag) contributed to building an acceptable new frame-orienting action. The third period begins at the end of Day 10, when team members prepared their bags and enacted a new "Himalayan-type of expedition" frame that induced a speech genre transformation, from the Logbook to the Travel Notes. Periods 1 and 3 will present findings in accordance with the initial and new frames (see Table 2), by means of emphasizing a description of the two material chronotopes inherent in each frame. Period 2 will showcase the conversational micro-practices employed to reframe adaptive sensemaking.

General frame = Mountaineering expedition "Amateur mountaineer" among friends / "First-ever"		
	Initial frame	New frame
<b>Frame</b>	<b>"Great explorers" expedition</b> Unknown mountains Boat serving as a base camp  BOAT	<b>"Himalayan-type" expedition</b> <i>Although</i> - "Maritime mountains" - No porters or conventional base camp  BAGS
<b>Itinerary and projected schedule</b>	West-to-East  - 36-hour boat ride to reach the western end of the Cordillera by Day 2 or 3 - 38 days to complete the crossing - "1 <sup>st</sup> -time" ascents	East-to-West Against the wind + most difficult stretch first - 9 days had already elapsed - Plus: A 36-hour ride on a cargo ship to reach the Cordillera on Day 11 at the opposite side - 29 days to complete the crossing - No "1 <sup>st</sup> -time" ascents Crossing of the Cordillera range HOWEVER No ascent of additional summits (due to time constraints, choice of equipment)
<b>Type of crossing</b>	Crossing of the Cordillera range PLUS Ascent of summits featuring technical difficulties  Boat as an itinerant base camp Moderate loads to carry	No base camp – complete autonomy => Bags Heavy loads to carry
<b>Participants</b>	2 teams of alpinists: - 1 in the mountain range - 1 as a backup team + other participants (researchers, ...)	Separation between: -alpinists (all in the Cordillera mountains) -non-alpinists (on shore)
<b>Safety considerations</b>	The boat as an itinerant base camp  Back-and-forth possible between boat and summits. A major commitment, Yet backup team at the ready.	No base camp, itinerant camps set up in the mountains No easily accessible backup possible over the entire duration of the crossing. An extreme level of commitment Vital issues, no backup team available.

Table 2 - The initial frame and new frame of the Darwin Expedition

## PERIOD 1: "GREAT EXPLORERS" MOUNTAINEERING EXPEDITION, THE LOGBOOK AND THE BOAT

### *Great explorers*

The initial framing of the expedition emerged during the pre-expedition phase and can be labeled a "Great explorers" mountaineering expedition, whose main goal was to achieve a "first" among friends (emphasizing the "amateur", as opposed to the commercial, aspect). It entailed various components, namely: a "mountaineering guide" familiar with the highly-experienced team of alpinists and professional guides, overlaid by an "amateur mountaineer" among friends angle (leisure pursuit, out of the ordinary, with a higher degree of commitment), along with a "first-ever" component (new feat in the world of climbing) that was unique, highly coveted and rife with vital issues and risk.

*"But there, within a 5-minute stretch, you've entered a black hole (...) To some extent, when we got back, I was practically relieved. That was not a hospitable mountain for people over there. We were going to die if left isolated on top during a storm, you're gone in a span of 10 min." (Alpinist, Post-expedition interview).*

The expertise displayed by this team was rooted in their collective experience coping with rock and ice conditions, winds, itinerary planning, anticipated hourly elevation differences, and a requisite knowledge of mountaineering equipment and basic tools of the trade (e.g. technical gear, logistics, maps, reliable weather information, GPS). In this initial frame, the plan consisted of arriving by plane at Punta Arenas and reaching the Cordillera via a 36-hour boat ride, then crossing the Cordillera range from west to east within 38 days, with the boat serving as an itinerant base camp advancing along the range in sync with the alpinists' progress. The alpinists were supposed to split into two teams (one in the mountains, the other as a backup to ensure safety and transport supplies).

Given its intended use as a means of reaching the Cordillera and an itinerant base camp, the boat was an essential component of the Cordillera crossing plan devised by the expedition leader (who had conducted route reconnaissance the previous year) and a number of his teammates. In this highly isolated region with a life-threatening context of unknown mountains in the "furious fifties" (latitude bands), the boat was considered critical to team survival. For the alpinists, "*it is impossible to plan the crossing without the boat*" (Alpinist 2, conversation held on Day 10). They could only really count on one another for rescue and administering first aid (since no airlift was possible). One of the guides doubled as an emergency room physician and, as such, had prepared a large trunk containing first aid medical equipment that was stored on the boat, thus making the boat a potential means of rescue as the expedition progressed. Serving as an itinerant base camp, the boat also provided an essential storage place for food and gear. Moreover, the project program influenced the anticipated direction and ascension patterns for the expedition team. As a case in point, the possibility for climbers to head back and forth between the summits and the boat would have enabled them to carry lighter bags, hence increasing their speed and performance, while adapting technical equipment to the precise ground conditions found in the range (which could not be known ahead of time). In addition, the boat was considered by the alpinists, who were familiar with the literature on dramatic polar and scientific explorations, as an essential component of the mission in this uncharted territory, in the vicinity of the South Pole and very close to Cape Horn. The boat was also intended to be a shared space critical to team and project organization. Over the course of the expedition, its role extended to offering a means for cruising along the coastal panoramas bordering the Cordillera.

### *The Logbook*

Another key element of this expedition was keeping a Logbook on an Internet blog covering the entire duration.

In our view, this Logbook can be considered as a speech genre in the Bakhtinian perspective. Team members, apart from the Chilean guide and the boat crew, were all native French speakers. They used the French term "Journal de Bord" (translated here as "*Logbook*") which contributes to our categorization of this text as a speech genre. In fact, *Journal de Bord*, associates the French word for "diary" (*journal*) with "on board" (*de bord*). First, the term "journal" encompasses a macro-level view of the Logbook within a narrative genre, thus favoring narrative entries, yet with a more specific and delayed narration mode since the narrator is changing positions over time and merely recounting events *a posteriori* between two fixed points in time. It is also characterized by temporary postings, sharing knowledge at the time of ongoing events, as the narrator reports events

whose outcome is only partially known. Second, the "on-board" qualifier provides a specification for this macro-format, inasmuch as it suggests that the Logbook chronicles a trip underway and implies spatial movement accompanying the temporal shift. It also suggests a collective mode of transport. This characteristic imposes a form of dependency, whereby the narrator embarks on a trip whose trajectory cannot be controlled, thus prompting a more collaborative writing style. Taken together, these characteristics give rise to specific stylistic attributes. For example, the physically uncomfortable position the narrator must adopt to post a Logbook entry tended to reduce the time spent writing, with some fragmented entries and disparate threads such as:

**Wednesday, 23 September 2009**

*[..] End of the morning turns sunny: slight breeze and sunshine in the forecast. 3 pm: Plans call for leaving the hotel and boarding the boat at the end of the day for 36 hours of navigation.*

*Point of departure for the expedition: Baya Oceano, as discussed and anticipated by (Alpinist 3, Leader and Second-in-Command-see Appendix1). Ultimately, departure for the boat around 5 pm.*

*Transfer of materials and occupants. The boat is still undergoing renovations, but the layout is great: very pleasant gathering space, looking out on the water! The only downside: the lower-level cabins are sunk pretty deep...*

Third, the discursive memory associated with the logbook genre (all the more since the alpinists brought books on board by Defoe, Shackleton and Cook) also implies literary and poetic writing templates that prescribe specific themes related to nature or adventure, as shown in the following excerpt. In light of the themes addressed, Logbook gave impetus to searching for adventure or novelty, while also showcasing the collective effort.

**Saturday 26 September**

*[...] Here is where the currents, tides and winds of both the Pacific and Atlantic meet, it's the elbow of the Strait of Magellan, the southernmost point on the American continent. Extending to Cape Horn, plenty of small islets and channels dot the craggy coastline. We're navigating in the legendary waters of the Tierra del Fuego where Magellan, James Cook, Fitzroy and Darwin all made contact with Indians who have since disappeared.*

Given all these characteristics, Logbook is a speech genre, with generic properties that concern function and composition, as well as writing rules, stylistic attributes and themes. Moreover, during the expedition, this Logbook constituted one of the pillars underpinning the sensemaking process, by anchoring the team members in a specific relation with space and time. With regards to space, the "legendary" places described by Magellan, Cook and others gave sense to the places they were discovering. With regards to time, registering events in the Logbook implied a form of distance from unfolding events, in ascribing meaning to them by means of an "in-between" narration between past and future. On the one hand, the writing shapes a representation of the past by reconstructing *a posteriori* the events of the day, and on the other, it structures the vision of the future regarding the uncertainty of the project. Together, this constitutes a linearized construction that integrates both past and future together in an ordered sequence, yet one that is continually

being renewed since projections into the future are subsequently qualified as past events. Consequently, the Logbook layout yields a particular type of relationship to time. The depiction of reality is not frozen in time once and for all, but instead it is pliable and ephemeral; it is permanently undergoing reconfigurations that alter the meaning subjects ascribe to the events taking place around them.

*The boat as a material chronotope*

The generic properties described above imply a specific structuration of both time and space that can be related to a specific chronotope: the chronotope of the boat that they boarded. We thus consider that this boat was for them a semiotic object: it materialized the specific relation to time and space that organized their writing of the Logbook.

In fact, the boat temporally and spatially organized the writing: from day to day, from place to place, synchronously with how the journey was progressing. The boat participated in the collective construction of meanings by giving sense to the unfolding events mentioned in the Logbook. Moreover, drawing on our linguistic analysis of the Logbook entries, we argue that the boat materializes a triple timespace structuration (see Table 3).

Time/space structuration	Time structuration	Space structuration	Excerpts
<b>Project</b>	<b>Project time</b> - Beginning - goal - execution period	<b>Cordillera space:</b> - Itinerary - Succession of peaks jutting up - Beginning - End	(1) " <i>We could not complete the crossing* despite several attempts.</i> " (Logbook D10) * of the Strait of Magellan
<b>Mishap</b>	<b>Mishap time</b> - A period of unpredictable occurrences - Sequence of outstanding pending issues - Gaps and discontinuities - Uncharted boundaries	<b>The Ocean space:</b> - Boundless - Amorphous - Battered by storms	(2) " <i>Today's the right day, but hope has been abruptly dashed because it was quickly perceived that the boat was turning around.</i> " (Logbook D9)
<b>Leisure</b>	<b>Leisure time</b> - Duration time - Appreciation, contemplation - Suspending the present	<b>The Leisure space:</b> - Boat / ports of call - Interior and living space ("foyer") - Opinions on the world	(3) " <i>It's a real pleasure to slip away into this magical setting.</i> " (Logbook D9)

Table 3<sup>3</sup> - Various time and space structururations in the Logbook entries

First, we identify a time structuration based on the forward-looking schedule of projects (i.e. "*Project time*"), with a beginning, a goal and a set execution period: the boat is one of the means involved in the overall expedition project, since it is supposed to progress with the team

3. In the remainder of this text, the terms "Project", "Mishap" and "Leisure" will refer to the associated spatiotemporal structururations.



throughout the entire expedition, from beginning to end. Second, a very different time structuration, based on the unexpected and focusing on what is happening at a specific point in time, is also being experienced ("*Mishap time*"). This can be related to the notion of *Kairos* in Greek philosophy. The boat materializes this *Kairos* time structuration, since it is dependent on maritime conditions and subjected to the risks of storms, mishaps and mechanical defects. Third, a calmer and more stabilized timeline ("*Leisure time*") is associated with the duration of leisure periods throughout the expedition that has also been conceived by the team as an opportunity to admire landscapes and enjoy spending time among friends. This "*Leisure time*" is assumed to elapse on a continuous basis, with no real finality or interruption. This also constitutes the boat's materialization: it is seen as the place for these leisure activities, for being together, and for admiring the coastline as it unfurls.

The specificity of such a Logbook no doubt lies in its heterogeneity and in its capacity to accommodate and incorporate these various temporalities. In fact, the Logbook excerpts we examined transition from one of these temporalities to another. This is apparent in terms of content and it is apparent in the forms in which content is mobilized.

As illustrated in Table 3, "Project time" implies a special lexicon with entries like *attempt, complete, cross* (Excerpt 1). The syntax "*we could not*", which is interpreted here as a failed attempt, is also inherent in the temporal configuration specific to the project. As for the "Mishap time", here again a dedicated lexicon is employed, as evidenced in Excerpt 2. The lexical material refers to chance, randomness (*the right day, hope, dashed*) and suddenness (*abruptly, quickly*); the gap between the present *today* and past tense *has been dashed* indicates a time leap reinforced by the discontinuity in syntax. Moreover, the perfect form of the verb *has been dashed* directly refers to the resultant state without any intermediary steps, thus reflecting the immediacy of the turnaround. Also, use of the passive form *was perceived* and *has been dashed* with no object, together with the inanimate subject of *turning around* (as if it were devoid of human intervention), highlights the helplessness of a crew subjected to climate uncertainties. The passivity of the individuals is also displayed by use of the verb *to perceive*, which indicates that the crew is merely a passive bystander to what is unfolding. Let us note as well that the word *hope* is used without any determination specifying whose hope is involved.

"Leisure time" is highlighted through various assessments of appreciation, as is the case for Excerpt 3. The terminology employed is composed of words of appreciation (*pleasure, magical*) that relate to an aesthetic vocabulary (*setting*). Furthermore, the durative nature of this time is evidenced by the intransitive motion verb *to slip away*, used here without any indication of either a starting point or a direction. The tense used is also durative, with a present continuous that is unlimited: it is a *real pleasure* over the entire time slipping away. Also, the space of the Cordillera is described as a *setting* for the cruise, i.e. expressing the sense of a buffer space protecting the foyer plus the ability to marvel at newly discovered landscapes.

In association with this triple time structuration the spatial structuration is also threefold. As regards "Project time", the Cordillera space is what determines the path to follow since the boat should sail along the Cordillera throughout the expedition. As regards "Mishap time", the sea is the space the boat must confront, with its unlimited space providing no direction or origin. As regards "Leisure time", the boat's

interior is the space constituting a collective foyer, isolated from the rest of the world, like some protective interlude suitable for contemplation.

This trio of spatial and temporal structurations is fundamental. In fact, it exposes what will need to be re-conceptualized in the new framing, now devoid of a protective boat (see Table 5 for an overview of the various temporal and spatial restructurations involved in the reframing). For these reasons, the boat appears as an incarnation of the situation's meaning: an organized "Great explorers" mountaineering expedition that must cope with unexpected events under extreme conditions and that was conceived as an opportunity to share a pleasant experience with friends. Hence, the boat materializes a temporality in movement and a worldview being renewed continuously; it portrays a chronotope as intended by Bakhtin, by virtue of characterizing the speech genre of the Logbook and condensing the meaning of what is happening. It is a crucial element in developing the frame that gives sense to the expedition. This boat, in addition to being a tangible boat on which team members are embarked, thus gives sense and generates discourse forms and contents. As such, it is a sign. For this reason, we have proposed labeling it as a material chronotope, i.e. an object articulating time and space that takes sense through actors' discourses.

## PERIOD 2: FRAME-FALTERING AND REFRAMING THROUGH CONVERSATIONS

### *Frame-faltering*

Various unexpected events occurred one after the other once the expedition had gotten underway. Deviating from its schedule, the boat was idled far from the Cordillera between Days 2 and 7, following several unsuccessful attempts at navigating towards the Cordillera and a succession of potentially hazardous incidents: an unprepared boat, permission not issued to leave the port, injury to one of the alpinists, a major technical problem requiring a return to the port, and as of Day 7 a succession of storms thwarting all attempts to cross, combined with a loss of confidence in the boat captain. With the boat idled and the overall project disrupted, the entire temporal and spatial configuration ascribed to the expedition had been altered. The situation had become uncertain and ambiguous: no one could project how long the boat would remain stranded, 150 km away from the mountains. The spatiotemporal arrangement aimed at the Cordillera and its crossing (project) thus had to be reassessed. After two or three days, the entire expedition would be compromised since the time remaining to complete the crossing would be insufficient. The central question revolved around how long the storm would continue to strand the boat.

Besides, the attempts to cross one of the world's most dangerous straits, as the myriad shipwrecks in the vicinity attest, were especially frightening for the alpinists. The "Mishap" spatiotemporal structuration permeated both time and space: all projections proved to be impossible. In particular, the weather reports transmitted by a European router and the Punta Arenas weather station were actually inaccurate and contradictory, and could not be trusted. Discussions held with local, similarly stranded fishermen and the boat's crew led to concluding that storms "*always wind up calming down*" in a few days or a week or two. This however did not resolve any underlying ambiguity: "*No one here would dare suggest a forecast beyond eight hours*" (Logbook, D10). From a spatial perspective, the sea had transformed into a potential tomb. On each attempt to cross

the Strait of Magellan, at the confluence of three oceans, the fishing boat rocked dangerously, shaken by the treacherous waves and wind gusts produced by the "furious fifties" (latitude); team members, surrounded by shipwrecks (this Strait is the world's largest maritime graveyard), indeed feared for their lives. Moreover, this situation undermined the "Leisure" spatiotemporal structuration found in the initial frame. The alpinists were prepared to enjoy and explore a spectacular unknown mountainous setting among friends but instead found themselves in a fishing boat, feeling ill, battered by powerful storms and prone to incessant disruptions preventing them from enjoying a continuous stretch of time. Even the base camp / foyer function of the boat had become a hazardous space due, among other things, to releases of carbon monoxide, seasickness, a flat-hulled boat completely inappropriate for this type of navigation, and a boat captain who admitted to "*feeling uncomfortable in his boat*".

This succession of incidents destabilized the time and space structurations built into the initial frame, while widening the discrepancies between alpinists' expectations and reality. The alpinists had expected to begin their ascension of the Cordillera peaks after a 36-hour boat ride, but a full one-fifth of the expedition's time allotment had already elapsed and they were still confined to the idled craft more than 150 km from the destination range, fearing for their lives amidst maritime storms, instead of trying to accomplish a "1<sup>st</sup>" in the mountains. The alpinists were experiencing what Weick (1993: 633) referred to as a "cosmology episode", wherein "people suddenly and deeply feel that the universe is no longer a rational, orderly system". The initial expedition framing was faltering, thus triggering a collective process of sensemaking. Given that the boat could no longer fulfill its functions, the type of expedition had to be reframed.

#### *Reframing through conversations*

On Day 9, the leader, in a somber mood, convened all team members to the boat's wardroom. The atmosphere was very tense: members discussed the stalemate situation at some length and sought to glean interpretations. Any development of plausible accounts was hindered by the ambiguity inherent in the cues and situation, which prevented any determination of whether it was preferable to wait or proceed according to modified plans. The expedition leader then presented alternative solutions to reach the Cordillera (i.e. search for another boat / board a cargo ship that might be able to navigate in spite of the storm / take a plane and then sail towards the Cordillera). The team discussed these alternatives at length (see [authors] for a complete description of this episode).

On Day 10, the leader and two alpinists returned to Punta Arenas. The leader then called the boat captain and apparently asked some team members to return to Land Point and board a cargo ship that would take them to the opposite side of the Cordillera. The team assembled in the wardroom to discuss the piecemeal information they had been receiving regarding this new plan and what it might entail. Difficulties in communicating with the captain and the lack of additional available information, due to satellite connection issues, impeded their understanding of the plan. At first, they were all very skeptical. Leaving the boat and boarding a cargo ship, dropping them off at the opposite end of the Cordillera from which point they would start the crossing, would imply dramatic changes to the expedition project and raise some major difficulties:

*Second-in-command: And this assistance, the boat making the connections, should it fail to show up, we're better off forgetting about it entirely.*

*Alpinist 2: Forget about the assistance? (...)*

*Second-in-command: So that completely changes the spirit of this... this crossing. Completely!*

*Alpinist 2: Yup, that's right. (Conversation, D10)*

Even though the overall objective of crossing the Cordillera remained intact, dropping the boat would mean forgoing an itinerant base camp and crossing the Cordillera in reverse (from east to west), starting with the most severe difficulties at the outset and against prevailing winds. This plan had been rejected during the preparation phase for these very same reasons. In addition, the alpinists would have to carry heavier loads, which would slow their progress and impede their ascent of the technically challenging summits. Moreover, all alpinists would have to advance together through the Cordillera instead of having two teams capable of relaying one another. It would also imply "*ignoring assistance needs*", thus eliminating any possibility of a reasonably quick rescue throughout the duration of the crossing and necessitating an extreme level of commitment on the part of all team members, in the face of obvious life-threatening conditions within an unknown and highly dangerous territory. All this meant a radically new type of expedition. The alpinists first evaluated it as both risky and presumably impracticable.

During an initial attempt at giving sense to what this new type of expedition could be, the second-in-command called it "Himalayan-type" in reference to the kind of expedition with which they were so familiar. But immediately thereafter, the discussion led them to amend this frame categorization by highlighting a fundamentally altering characteristic, namely: "against the wind":

*Second-in-command: In other words, we're embarking on a heavy, Himalayan-type expedition against the wind.*

*Alpinist 3: With the wind in our faces.*

*Second-in-command: Against the wind. That's too much, not with the wind, but actually fighting against it.*

*Alpinist 2: Except if...*

*Second-in-command: Things are going to get pretty intense here. (Conversation, D10)*

The emergence of the new frame is grounded in the transition from one material object (the boat) to another (the bags) through team members' conversations.

During the afternoon, the conversations were oriented around different questions, which arose as new information was provided through phone calls with the leader (see Table 4): first, clarifications of who would remain on the boat and who would leave; second, what gear to take; and third, for what purposes. These questions were all interrelated: each individual was assigned a different bag depending on his/her status and role in the expedition, and what to pack was intrinsically tied to the type of expedition. These questions gave rise to repetitions and reformulations, and they evolved over the course of the interaction. Throughout this evolution in project mission, the topic of discussion itself evolved, e.g. the new plan and the best way to complete the expedition according to such a new plan. This topic is what we call a « discourse object», in keeping with a line of analysis developed by Grize (1990) (see above): as such it is classified and reclassified through discourse, by means of various linguistic

mechanisms. These reclassifications constitute the microprocesses that allowed the shift from one meaning of the expedition to another. More specifically, they allowed the team to move from a collective perception of the expedition to a distributive one, with the team being split, the tasks divided and the equipment shared. Table 4 presents some of the excerpts illustrating these mechanisms.

Excerpt (4) illustrates a linguistic mechanism used for dividing the group: "*those without the option of joining the crossing*" rewords "*some*" and specifies it by introducing a differentiating factor ("*those without the option of joining the crossing*"). This mechanism is characteristic of a process at work throughout the conversation, namely the process of dividing the group into several subsets (alpinists vs. the others, women vs. men, locals vs. non-locals). Two different linguistic techniques perform this division, as illustrated in Excerpt (5). The first consists of contrasting one subject with another ("*Emilio*" who stays on the boat vs. "*us*" who leave); the other entails isolating a subset ("*the girls*" (i.e. the researchers) or "*us*") in response to the "who" question ("*Who should we leave on board?*").

Collective	Linguistic mechanism	Discursive function	Excerpt
↓	Splitting	Dividing the collective	(4) " <i>Afterwards, perhaps... that <b>some</b> individuals will remain in Puerto Williams, namely <b>those without the option of joining the crossing</b></i> " (Alpinist 2, Day 10)
	Contrasting Isolating	Identifying the "who"?	(5) Alpinist 4: " <i><b>Who</b> should we leave on board? <b>Who</b> stays with <b>Emilio</b>? <b>The girls</b>, are they coming with <b>us</b>? [...]</i> "
		The girls vs. us Emilio vs. the others Us vs. others	Alpinist 4: " <i><b>Who</b> would be better off staying on the boat? <b>Emilio</b>, for sure! After that (...)</i> " Alpinist 4: " <i><b>For us</b>, if you like, I'd see us returning to End Point on another boat, which would make its way...</i> " (Conversation, Day 10)
	Reformulation , punctuated by "That means"	From "Who" to "What"?	(6): [Due to communication difficulties with the three alpinists who set out to Land Point, those who remained in the boat were unsure how many of them were supposed to leave the Nueva Galicia to board the Bahia Azul: 3 or 13?] <i><b>Alpinist 2: "Three of us will stay"</b></i> <i><b>Alpinist 4: "It must be thirteen then, if three of us remain. There are sixteen of us."</b></i> [digression] Researcher 2: " <i><b>That would mean lugging all of your stuff</b></i> " (Conversation, Day 10)
↓	Repetition and focusing on an Object		(7) Alpinist 3: " <i><b>What's the point in taking all the food?</b></i> " Alpinist 2: " <i><b>All the food?</b></i> " Alpinist 3: " <i>Yes.</i> " [...] Alpinist 3: " <i>For me, it's useless to <b>take all the food</b>, because in any case, we need the boat. So it means carrying <b>all the food</b> there, putting it on the beach, so the boat can pick it up, and we can handle the food supplies during the crossing. There's no way <b>we'll use all the food</b>. We won't be able to <b>carry it all</b> by ourselves! It's impossible!!</i> " (Conversation, Day 10)
		Dividing and specializing the "What"?	(8) Second-in-command: " <i>We're going to see if everybody has taken <b>ropes</b>. Have you thought about taking <b>ropes</b>?</i> " Alpinist 4: " <i>I've got <b>one</b>.</i> " Second-in-command: " <i>I have <b>two</b>, well, I have a <b>double rope</b>.</i> " Alpinist 4: " <i>It's easy to do.</i> " Second-in-command: " <i>It's easy to do, but we've got to anticipate. <b>When it comes to the equipment</b>, we've never really talked about it.</i> " (Conversation, Day 10)
Distributive			

Table 4 - Micro-practices of sensemaking

Another micro-practice is based on a typical reformulation marker, e.g. *"that means / that is to say"*. As presented in Excerpt (6), team members are trying to grasp the leader's intentions, which were difficult to understand (due to the very poor satellite connection between him and the boat captain). Moreover, the captain was relaying instructions to team members in Spanish. Those listening in were trying to anticipate "who" might be among the departing party and "who" would remain. Researcher 2's statement, led by the phrasing *"that means"*, under the pretext of presenting what follows as a reformulation, actually introduces a new question that would serve to focus the discussion going forward as new information trickled in regarding the bags and the division of equipment among the various expedition team members. These bags would become the discourse object. What they would carry is conditioned in relation to their potential function within the new type of expedition format. This micro-practice thereby supported the team split already underway.

The question over food came to the fore during the discussion (Excerpt 7). The expression *"all the food"* is repeated throughout the interactions. Once the boat was no longer serving the role of a base camp and all its contents needed to be apportioned into the bags, considerations turned to evaluating both the weight that alpinists would have to carry themselves and the food they would need for survival (depending on the number of days they were to remain in the mountains). The question of how best to divvy up the equipment among team members' bags took center stage, as illustrated by Excerpt (8), which displays the transition from one reference object (climbing ropes) to another, as evidenced by: *"When it comes to the equipment"*, which is a generalization device. The entire project thus came under scrutiny via this equipment angle. In reviewing everything they needed to transport in their bags, the alpinists gave meaning through their conversations to the emergent frame and then stabilized it.

### PERIOD 3: "HIMALAYAN-TYPE EXPEDITION", TRAVEL NOTES AND THE BAGS

The third period began when team members prepared their bags, and enacted the new frame, called "Himalayan-type of expedition". This in turn induced the transformation of the speech genre from the Logbook to the Travel Notes.

#### *The "Himalayan-type expedition" frame*

The alpinists gradually converged on a common understanding of the main characteristics of the new frame. The linguistic processes analyzed above therefore subtly exposed how this expedition might play out without the boat, making it possible to stabilize the emergent frame as a "Himalayan-type expedition, but without porters or base camps".

For one thing, crossing the Cordillera would be an even more difficult feat than that planned since it would need to be accomplished in 29 days (vs. 38) and would entail a more difficult and complex route from the outset, and against the prevailing wind direction. Furthermore, this new plan necessitated reconfiguring the teams and separating alpinists from non-alpinists. Moreover, all alpinists would need to advance together, since the absence of the boat meant no backup team in place. Lastly, being deprived of an itinerant base camp, and with a total absence of porters (as opposed to the classical Himalayan expeditions), alpinists would have to carry all the gear, equipment, food and medicine themselves, which would

slow their progress and hence directly threaten not only the success of the expedition, but their very survival as well. The question of what needed to be hauled in the bags or left on the boat is thus fundamental in this new frame. Operating with the mindset of alpinists, they were accustomed to assessing these options for any climb, as several of them had already engaged in a similar exercise during previous expeditions. They possessed an embodied experience of the potentially fatal consequences due to poorly packed bags (hunger, cold, memory of accidents befalling other alpinists). Asking these questions about the bags helped them concentrate on the tasks at hand, which were all too familiar to them, in contrast with the unexplored mountains.

### *Travel Notes*

The emergence of this new frame is correlated with a change in the Logbook itself. The change of plans also modified Logbook posting conditions. From the time alpinists left the boat, the Logbook would no longer be based on collective writings while physically remaining on the boat, but instead postings would originate from a single author (the Webmaster), with inserts corresponding to texts dictated by the various team members. Log entries thus became more heterogeneous and broader in scope, dominated more by descriptive sequences than by what had been narrative sequences.

The following excerpt indicates how the post from Monday the 12<sup>th</sup> incorporates elements dictated by the other teams, with such elements referred to as "*texts*" and then "*summary*". This summary presents the prototypical characteristics of the description: many qualifier and participle adjectives (*welcoming, named, impressive, forming, linked*) forming semantically-loaded, complex nominal groups, imagery-laden verbs (*tower*), relatively long and stylistically dense sentences.

#### **Monday, 12<sup>th</sup> October**

*Day with plenty of tales to tell!*

*Look here for the **texts** from DARWIN teams 2 and 3 recounting their time spent in the mountains. Then, the Logbook describing our morning [...]*

*Enjoy the read!*

#####

**Summary** of the days spent in the mountains by François, Dominique and Yvan

"DARWIN 3" team

#### **Thursday, 8<sup>th</sup> October**

*First night spent in the tent, on the **welcoming** grass of the Beavers' Camp, **named** that way for the proximity of many structures built by these critters. **Impressive** dams, **forming** differently-sized lakes, in the middle of which **tower** huts, **linked** to one another via a system of streams.*

To a certain extent, the project reorientation in favor of the "*geographic and human discovery of Terra Incognita*" (Travel Notes, D29) served to enable acknowledging the transition from one genre, i.e. the Logbook, to another genre, i.e. the Travel Notes. This transition entailed protocol changes, such as the lack of content restriction, and became event-driven rather than a project execution tracking device.

*The bags as the new chronotope*

The bags emerged as the artefact around which the new frame was constituted, thus materializing the transition from a collective to a distributive mode of organizing and taking the place of what the boat had represented in the initial frame.

This means the bags enabled redefining the layout, in both its temporal and spatial dimensions, of the "Project " component within this new frame. They materialized new time and space structurations and enabled safeguarding members' survival in an uncertain and hostile environment. By packing their bags, expedition members had to project and anticipate the kind of terrain they would be traversing and the time needed to complete the crossing, depending on weather and level of autonomy to expect. Conversely, bag weight was used to determine the space to be crossed within a given time period. On the other hand, preparations had to incorporate "what might happen", i.e. the unexpected. Members would have to face the life-threatening difficulties inherent in this unknown setting, with just their bags and nothing else. This unknown setting is the Cordillera; however, this Cordillera no longer demarcated an itinerary, but instead a space the alpinists would have to traverse. Encompassing myriad and unpredictable difficulties, this space had become the new frame's "Mishap" component, just like the sea had been for the boat. With respect to the "Leisure" component, the "cruise" had taken on a totally different aspect with the consideration of bags; the focus was no longer placed on enjoyment and having fun, as leisure-oriented objects (guitar, champagne) had to be left behind. The time was no longer seen as that of a cruise; it had been replaced by time spent carrying heavy backpacks. And the secure space was no longer that of the wardroom; it had been reduced to the space of each bag, with any excess weight having to be excluded and with all that was necessary to ensure personal safety having to be included. With their bags on their backs, team members were forced to become part of the decor, i.e. the open and wild spaces where they were now headed instead of observing the setting remotely from the boat. The bags thus materialized the triple restructuration of time and space, in reorganizing the time and space of the expedition. As such, they incarnated a new meaning ascribed to this expedition, as expressed in the Travel Notes, which were updated on a daily basis while discovering the great unknown of the Cordillera. As such, the bags portray a chronotope as intended by Bakhtin for this new genre of Travel Notes that progressively emerged after Day 10.

*Material chronotope guiding collective action*

The bags did not serve as chronotopes simply for the purpose of reconsidering the meaning of this expedition. As material chronotopes, they were as tangible as the boat and they had to be packed. Consequently, they initiated action and enacted the new frame, i.e. the tangible preparation of the long anticipated climb. This enactment was also efficient inasmuch as each individual was given free rein: each member would pack his or her own bag. Hence, in addition to being key to sensemaking and the basis for reframing, the bags also happened to be the action trigger. They were responsible for jump-starting the project: the act of packing bags allowed expedition members to reconnect with the prospect of crossing the Cordillera, and this outlook dictated their choice of equipment to pack. Time therefore, which had come to a standstill, could resume ticking, while space was once again opened up to be traversed, in



lugging the bags team members had been preparing since the end of Day 10. This fixation on the bags thus had an immediate effect. Team members had been given a new objective (i.e. packing) to infuse meaning into their efforts. Granted it was a modest objective, but one that would initiate action. It seemed vital for team members to find something to do: it was a precondition of their acceptance of the new plan.

*From collective to distributive mode of organizing*

In addition, the preparation of bags involved each team member's identity and exposed them to a process of redefining their role through a revised allocation of tasks and loads. As such, the bags were contributing to another crucial element for the subsequent part of the expedition: they served to "distribute the collective". The relationship with time had become more individualized. Dropping the boat reconfigured the space, by splitting the group into different teams, each of which sorted their bags differently. The boat corresponded to a shared time and space, whereas the packing of bags was strictly correlated with the distinct identity and role of each expedition member. Packing their bags struck team members as a relevant course of action, especially since bags implied a "who". Packing one's bag connoted taking care of oneself and meeting one's own needs, as well as accommodating whatever the group had to distribute to each individual. This step involved distributing on behalf of the collective, so as to earn everyone's support. The conversation on Day 10 thus ended with a statement expressing this precise distribution of actions, clearly marking the enactment of change:

***"Everyone will get involved, in their respective fields, doing the best they can."*** (Second-in-command, conversation D10).

In this excerpt, "Everyone" and "respective" symbolize the distributive emphasis that would shape the expedition's new organization, but that would also trigger each member to take action. The shared objectives became each individual's objectives: "doing the best they can". On the other hand, the phrase "will get involved" denotes the initiation of mutual action (through use of the word "involved"). The bags thus offered a condition that allowed every member to not only accept but also enact change.

## DISCUSSION

In this paper, we have demonstrated how adaptive sensemaking in an extreme context is materially framed and reframed through time and space by examining the role played by chronotopes of a boat and bags during this discursive reframing process. Our findings indicate how making sense involves not only connecting cues, whether immaterial or material, to frames but also collectively yielding a tangible time-space interface within the chronotopic objects organizing the discourse. From this perspective, the present study has enhanced our understanding of the links between reframing and distributive enactment by anchoring the discursive framing of a radical shift in a move from one material chronotope to another (see Table 5 for an overview of these links). With sufficient time and space to produce a plausible account, shifting to a chronotope that better matches the situation can actually "resonate" and induce change acceptance as well as enact a new frame.

Shared		Distributive	
	<b>Micro-practices of sensemaking</b>		
<b>Frames</b>	"Great explorers" expedition (unknown mountains + boat as a base camp)		Himalayan-type expedition (albeit maritime mountains - without porters or a base camp)
<b>Genre</b>	Logbook		Travel Notes
<b>Material chronotopes</b>	Boat		Bags
<b>Associated conceptions of time</b>	Project time	Splitting (Dividing the collective) ↓ Contrasting/Isolating (Identifying the "who"? The girls vs. Emilio vs. the others and so on) ↓ Reformulation, punctuated by "that means" (From "Who"? to "What"?) ↓ Repetition and focus on an Object (Dividing and differentiating the "What"?) ↓	Packing selection of equipment / supplies, food and medicine depending on anticipated conditions advancing in the Cordillera: what's needed to progress and survive (tents, 3 freeze-dried rations a day, medicine...).
	Mishap time		Packs to anticipate what might happen
	Leisure time		Time spent carrying packs (avoid all excess weight)
<b>Associated conceptions of space</b>	Project space: The Cordillera range		Fragmenting the Cordillera into several stages
	Mishap space: The wilderness of the sea		The Cordillera wilderness
	Leisure space: the interior of the boat's "foyer"		The bag on one's back: What's needed to survive

Table 5 - Chronotope shifting and micro-practices of sensemaking

This paper highlights the role of chronotopes in frame-shifting. The bag chronotope enabled the writing of new accounts, suggestive of a new sub-genre capable of giving rise to a new meaning of the expedition (no longer confined to a Cordillera crossing). Yet developing this chronotope on its own was insufficient; it had to become effective and responsible for generating entries that would indicate a Travel Notes sub-genre. This new chronotope had to be activated in order to stimulate reflective, thoughtful writing. In other words, a person cannot simply decide what any situation means. Thinking, writing, recounting and discoursing are all necessary. This perspective presumes a minimum latency period between the time when change is accepted and when new meaning takes root. The bag chronotope made it possible for the team to reframe the project through a reclassification exercise, impart meaning to the new frame, and redefine each member's role via an allocation of tasks and loads. The bags served to transform unexpected dangers into anticipated challenges; they fulfilled each member's needs and even marked their own identity, thus establishing a road map to guide individual action.

Our paper raises the importance of speech genres through which sensemaking proceeds. The standard recognized genre of an expedition relies on "explorer accounts" of travel and adventure, typically found in books, films and audio or photographic recordings. In our case, two

discursive genres are observed, called respectively the Logbook and Travel Notes. Another important point is that the transition from initial Logbook to Travel Notes did not occur immediately. The postings entered into the Logbook at the end of Day 10 were still of the same genre. They gradually changed, becoming less collective and more descriptive, over the ensuing days, with the "Logbook" component becoming increasingly less prominent. Moreover, our findings highlight the fact that the sensemaking process is embedded in specific genres that operationalize the contextual frames in action. This Darwin Expedition shifted from an "exploration" frame involving setting up a mobile base camp ("Great explorers" frame) to a "Mountaineering expedition" frame, whereby each member carried his or her own food, shelter, equipment, etc. ("Himalayan-type of expedition" frame). Since the notion of speech genre can be applied in contexts other than literature and novels, this finding motivates organizational researchers to apply the Bakhtinian concept of discursive genre when conducting research on frame replacement and sensemaking. For example, it is likely that Balogun & Johnson's (2004) paper can be rewritten within a Bakhtinian framework. Through middle managers' diaries, these authors observed the transition from one frame ("organization as hierarchy") to another ("core division liaison efforts"). In considering middle managers' diaries as a specific genre, it should be possible to observe how their frame has changed over time and which material chronotopes have been central to replacing the old frame with the new one. Such a study would serve to further develop the idea that "change is achieved through social relations" (Balogun & Johnson, 2004: 543) by exposing "the co-constitutive nature of discourse and materiality" in organizational change (Hardy & Thomas, 2015).

In describing the micro-practices of sensemaking, whereby a new frame emerges through action, this research has highlighted a hidden facet of what Balogun and Johnson (2004) called "clustering" sensemaking. Until now, sensemaking research has focused on replacing frames while neglecting the micro-practices involved in the critical period when team members move from shared to distributive sensemaking. By targeting the linguistic mechanism and associated discursive function (shown in brackets in Table 5), our research has not only identified the micro-practices of sensemaking during the critical phase of frame replacement, but has also analyzed the effects they produce on language over time. Moreover, we have exposed the process-oriented function tying these micro-sensemaking practices to one another over time. In considering the temporality of reframing, we have demonstrated that such micro-practices were activated through "progressive approximations" (Weick, Sutcliffe & Obstfeld, 2005) since they are episodic and discontinuous, with many repetitions, trials and reevaluations.

The fine-grained analysis of this effort complements existing sensemaking studies in extreme contexts (Colville, et al., 2013; Cornelissen, et al., 2014; Dunbar & Garud, 2009; Weick, 1993; Whiteman & Cooper, 2011). Most of these research studies explain why some accounts lead to failure and inertia, whereas our case explains how such studies have led to collective action. The entire sensemaking process, from when the frame faltered to its acceptance and the enactment of a new frame, occurred discontinuously over the two days of close examination. This discontinuity may be ascribed to the highly distributive nature of the change in plans, yet it also pertains to the multiplicity of parameters involved. The creation and enactment of change are not only discontinuous but also time-consuming, since time is required to change from one chronotope to the next. This is especially true when searching for a

chronotope that matches the coexisting temporalities and spaces. The time to accept change and enact this acceptance does not coincide with the time when the new plan was formulated. Team members packed their bags that evening, yet the expedition in its revised frame only began once they had reached the Cordillera. This lapse appears necessary, as evidenced by two indices. First, the alpinists remained reluctant despite having announced their acceptance: they enacted their acceptance by packing their bags yet still questioned the enactment of change itself. Second, reframing takes time, not merely due to a resistance to change, but also because change is a truly complex task. However, in an extreme context with insufficient time to frame a new situation or environment, it becomes very difficult and perhaps impossible to shift from one chronotope to another. If team members are accustomed to dealing with emergency situations featuring similar patterns, adaptive sensemaking might emerge from intuition, tacit knowledge, etc. Otherwise, adaptive sensemaking is rare in extreme contexts unless the sensemakers involved possess previous experience with similar situations.

## CONTRIBUTIONS

Our study provides three main contributions. First, this paper explores the role of materiality as a cue for adaptive sensemaking in extreme contexts by emphasizing the temporal and spatial dimensions (Clegg, et al., 2013; Guthey, et al., 2014; Hyde, 2015; Tuana, 2008; Whiteman & Cooper, 2011). Our study has highlighted the role of material objects (the boat and the bags) other than those used by actors to accomplish their work (i.e. in our case, their equipment, ropes, tents, skis, harnesses and helmets). By referring to a "material chronotope", we have devoted our study to "objects" that collectively and significantly matter in the context of this expedition. Such objects were obviously related to one another, yet they remained highly critical, in addition to exemplifying issues relative to the temporal and spatial aspects of sensemaking. Admittedly, these objects proved to be decisive during the episode under study herein, by virtue of expressing their full potential when carrying out the chronotope-shifting (i.e. replacing the dropped boat by packed bags). Moreover, our study showcases the "mediating role" of objects relative to sensemaking in extreme contexts. Beyond acting as mere "intermediate agents" (Cornelissen, et al., 2014), objects can become signs and act as "spatiotemporal triggers": the spatiotemporal properties of objects help define and stimulate the occurrence of potential micro-sensemaking practices. Further studies should enhance our knowledge of objects that are not only concerned with socio-material working conditions (Stigliani & Ravasi, 2012) but embed key spatiotemporal aspects of their team's or organization's "*raison d'être*". The need also exists to explore how objects play the role of "spatiotemporal triggers" in contexts other than an expedition. For example, international projects, which play out in a context that combines events and teamwork based on specific spatiotemporal conditions, might be a relevant setting for advancing the role of materiality in sensemaking.

The second contribution complements existing research on chronotopes (Boje, et al., 2016; Lorino & Tricard, 2012; Musca, et al., 2014; Pedersen, 2009; Vaara & Pedersen, 2013) by promoting the notion of material chronotope (Milbourne & Hallenbeck, 2013). Our findings indicate how chronotopes structure the various types of accounts produced when co-constructing meaning in extreme contexts, while highlighting the fact that chronotopes are materialized by material objects and artefacts

promoting action. Our research provides a broader view of chronotopes than that generally conveyed in management and organizational studies (Boje, et al., 2016; Lancione & Clegg, 2013; Lorino & Tricard, 2012; Musca, et al., 2014; Vaara & Pedersen, 2013;). Given that chronotopes concern all speech genres, and not just the discourses developing narratives, the notion must be carefully monitored whenever it is introduced at the organizational or team level. Further investigations into the various discursive processes and genres through which discourse objects are constituted in real life might extend how adaptive sensemaking in extreme contexts is achieved or not.

The notion of material chronotope was first defined however by Milbourne & Hallenbeck (2013), who were studying the development of the 18<sup>th</sup>-century microscope. According to them, a material chronotope is "a spatiotemporal user orientation" routinely embedded in gender and performance. A material chronotope appears to be a rhetorical or narrative-stabilized orientation or routine (e.g. the naturalist discoverer, the polite collaborator and objective observer, corresponding respectively to the pocket microscope, the solar microscope and the standard microscope). Put otherwise, Milbourne and Hallenbeck (2013) associated a material chronotope with what we call herein a frame (e.g. "great explorers" expedition), thus neglecting its Bakhtinian roots. Moreover, the microscope appears to be a technological object central to the work of a scientist, which explains why the authors defined a material chronotope in terms of "user orientation". Consequently, their vision of a chronotope, despite being proposed as a means to link space, time and materiality, is not really related to giving sense and a "*raison d'être*" in generating collective action. For us, beyond its abstractness, a chronotope is generally embedded into a material entity corresponding to tangible objects, not necessarily as an instrument to perform work but rather to embed key spatiotemporal aspects of a team's or organization's "*raison d'être*" (i.e. bags to be packed and carried). The boat and bags are material chronotopes since they have materialized unique opportunities for making sense of unexpected events in space and time. Subsequent research should explore the role of material chronotopes by investigating how key objects act as spatiotemporal triggers and contribute to transforming frames through diverse discursive genres specific to other extreme contexts (e.g. humanitarian workers' diaries in extreme contexts, digital literacy to understand institutional or community resilience, public hearings after a catastrophic event to study sensemaking, and so on).

Third, this paper highlights the micro-processes of sensemaking at play in extreme contexts through a linguistic analysis of the discursive and material practices involved in this process (Colville, et al., 2013; Cornelissen, et al., 2014; Dunbar & Garud, 2009). Moreover, it documents a discursive frame-faltering and reframing process in real time (Balogun, Jacobs, Jarzabkowski, Mantere & Vaara, 2014; Maitlis & Christianson, 2014; Stigliani & Ravasi, 2012;). Further research on sensemaking in general and sensemaking in extreme contexts in particular is needed to advance the discursive and material aspect when reconstituting micro-sensemaking practices. Most sensemaking studies are based on a weak ontology of sensemaking by failing to define the approach or theoretical assumptions underlying their view of sensemaking. In relying on the Bakhtinian framework, we provide a more detailed view of both the transition from one frame to another and the linguistic devices employed by actors to make sense through interactions, conversations and writings.

Our research also provides a holistic view of the temporal anchoring of sensemaking. Instead of looking at either retrospective or prospective aspects, we have explored the micro-practices of sensemaking as they were being deployed in real time by scrutinizing a specific, yet central, episode of sensemaking reconstitution. As the pivot towards a "who would leave" gradually played out and then transformed into a "what to pack", the discussion clearly focused on upcoming actions. These actions were perceived as immediate: consuming the present, extracting it from an immobile state, and propelling it into the future. At the same time, team members were intent on previewing the new type of expedition awaiting them. Follow-up research should engage in sensemaking as it happens in the present moment or in real time, whether the context be conventional or extreme: such is the best approach to accurately capturing the three dimensions (past, present and future) in which sensemaking is carried out in practice.

## **IMPLICATIONS AND LIMITATIONS**

This study has implications for researchers and practitioners. For researchers, by exploring the role of materiality in frame-shifting and its inscription in time and space, we offer a unique and innovative way to understand sensemaking processes and practices. The study of material chronotopes through the linguistic analysis of conversations and organizational texts promises to be a fertile ground for better understanding how sensemaking is materially framed and reframed through chronotope-shifting. In other words, our study calls for more research aimed at capturing how, why and under which conditions materiality or central objects (different from equipment) matter in collective action. For practitioners, our findings highlight the fact that it takes time to shift from acceptance of a new frame to the enactment of change. Each individual had to find a path to reshape his or her thinking about the meaning of the expedition, between the time when the new chronotope began playing a role and when it enabled them to consider the situation from an alternative perspective. This sub-period, internal to the reframing process, needs to be taken into account when facing extreme conditions. Furthermore, it appears that discursive tensions might be necessary in order for members to achieve adaptive sensemaking.

Despite its innovative character, this research still presents some limitations. Based on a single case study, its results cannot be generalized to any expedition. We must admit that the central episode studied (Days 9 and 10) does not exactly correspond to what the literature used to call an "extreme event" (e.g. tsunami, hijacked flight, intense fire), in which time can make a difference between life and death. However, the Darwin expedition as it unfolded in an unknown mountainous zone never crossed due to severe conditions certainly constitutes an extreme context (Hällgren, et al., 2018; Hannah, et al., 2009). For methodological purposes, the Darwin expedition nevertheless allows us to show how adaptive sensemaking in an extreme context is materially framed and reframed through both time and space.

## APPENDIX 1: AN OVERVIEW OF THE EXPEDITION TEAM (DAYS 1 TO 21)

Pseudonym	Main role	Relevant characteristics
<b>Leader</b>	Expedition leader	Highly experienced mountain guide. Has conducted several expeditions (Himalayas, Andes, etc.). Familiar with all expedition team members
<b>Second-in-Command</b>	Mountain guide	Almost no experience with expeditions. In charge of guide training. GPS expert.
<b>Alpinist 1</b>	Mountain guide + medical doctor	Currently working as an MD in a hospital / mountaineering emergency unit
<b>Alpinist 2</b>	Mountain guide	Tremendous experience in alpinism and expeditions.
<b>Alpinist 3</b>	Mountain guide	Tremendous experience in alpinism and expeditions. Frequently works with the leader.
<b>Alpinist 4</b>	Mountain guide trainee	Childhood friend of Alpinist 5
<b>Alpinist 5</b>	Mountain guide trainee	Childhood friend of Alpinist 4.
<b>Alpinist 6</b>	Mountain guide	Young, but highly experienced. Injured at the beginning of the expedition, requiring repatriation.
<b>Alpinist 7</b>	Very good alpinist	Experienced climber
<b>Alpinist 8</b>	"Amateur" climber	Personal friend of the leader. Responsible for the idea and composition of the expedition. In charge of financing matters. An entrepreneur.
<b>Cameraman 1</b>	To make the film	Experienced climber
<b>Cameraman 2</b>	To help Cameraman 1	Experienced climber
<b>Webmaster</b>	To design the expedition website and provide inputs	
<b>Researcher 1</b>	Researcher	("girl")
<b>Researcher 2</b>	Researcher	("girl")
<b>Guest member</b>		
<b>Emilio</b>	Chilean guide	Leader's friend
<b>Captain Ernesto</b>	Chilean captain of the Nueva Galicia boat	

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