Breaking the Conduit: A Relational Approach to Communication in Management and Entrepreneurship

Breaking the Conduit: A Relational Approach to Communication in Management and Entrepreneurship

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By

Sai Gayathri Kalvapalle

born in Hyderabad, India

Erasmus University Rotterdam

Doctoral Committee

Promotors: prof. dr. J.P. Cornelissen
prof. dr. P.P.M.A.R. Heugens

Co-promotor: dr. M.N. Cholakova

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Chapter 1: Introduction

1.1 Overview and Relevance

Communication constitutes organizational reality. Communication in organizations has long been a central area of study from a variety of theoretical perspectives, ranging from sensemaking (Abolafia, 2010; Cornelissen, Mantere, and Vaara, 2014; Whittle, Vaara, and Maitlis), strategy (Fenton and Langley, 2011; Rouleau and Balogun, 2011), decision-making (Salancik, Pfeffer, and Kelly, 1978), and entrepreneurship (Clarke and Cornelissen, 2011; Martens, Jennings, and Jennings, 2007). Across these theoretical perspectives, scholars have theorized communication as being constitutive (Ashcraft, Kuhn, and Cooren, 2009; Cooren, Kuhn, Cornelissen, and Clark, 2011; Vásquez and Schoeneborn, 2018), performative (Goffman, 1959; Taylor and Van Every, 2000), adaptive (Chia and Holt, 2006), and cognition-based (Gioia, Donnellon, and Sims Jr., 1989).

It is generally uncontestable that communication has been a cornerstone of management and organization studies since the field's inception. Not only has the topic been fundamental to scholars and theorists; business leaders and other organizational members have also been eager to advance their own communication skills and knowledge. This practitioner interest is best reflected in burgeoning sales of popular press books exploiting the ideas of communication in becoming better leaders, giving feedback, listening, telling compelling stories, and building strong teams (e.g., Grant, 2021; Sinek, 2011).

Organizational communication accomplishes a range of goals, including but not limited to comprehension (Axley, 1984), persuasion (Cheney, 1983; Weick and Browning, 1986), strategic planning (Stigliani and Ravasi, 2012), and identity-formation (Phillips and Brown, 1993). Scholars have theorized communicative processes that are verbal (Cornelissen, 2012; Garud, Schildt, and Lant, 2014; Martens et al., 2007), textual (Balogun and Johnson, 2004; Gephart, 1993), nonverbal (Chen, Yao, and Kotha, 2009; Clarke, Cornelissen, and Healey, 2019), digital (Leonardi, 2009), and through material artifacts (Leonardi, 2010).

In this dissertation, I focus on how organizational actors communicate under conditions of uncertainty. Uncertainty is arguably most manifest in two organizational contexts: crisis scenarios faced by high reliability organizations (HROs), and contexts of entrepreneurial resource acquisition. While the uncertainty in both contexts is characterized by different determinants, how actors overcome, harness, and even exacerbate the uncertainty is ultimately in and through processes of communication.

Understanding the multifaceted role that communication plays, particularly in uncertain conditions, is important in three fundamental ways for management and organizations. First, it helps us see how linguistic variation, that is, choosing between literal codes or figurative language, can either mitigate (or exacerbate) mutual understanding, which in turn promotes (or hinders) organized action (Chapter 2). Second, it provides a perspective on how uncertainty is not always something that needs to be overcome or mitigated, but can actually be leveraged, by anticipating the to the benefit of those seeking approval or support, such as entrepreneurs leading very early-stage ventures (Chapter 3). Finally, we learn that in the same interaction, uncertainty can act as both a helper and a hinderer, depending on the strategic objective of the interactant (Chapter 4).

In three essays, I elaborate different communicative processes using different methodologies. In Chapter 2, I elaborate how organizational actors mutually manifest meaning in high reliability organizations, in Chapter 3 I investigate entrepreneurial funding pitches as an arena wherein entrepreneurs can build relational capital with investors, and in Chapter 4 I take stock of and integrate all the literature on entrepreneurial pitching that has been developed over the last three decades. I chose to adopt three distinct methodologies in this doctoral dissertation in order to develop knowledge on communication in organizations in three distinct ways. Conceptual research allows for theory-building by meaningfully incorporating concepts from adjacent fields to address shortcomings in organizational theory, experimental research promotes confidence in causal relationships between hypothesized variables, and integrative reviews synthesize different bodies of research to address theoretical fragmentation in a given research area, while also promoting under-represented perspectives. In Table 1 below, I visually represent each chapter and its associated methodology.

Chapter	Methodology	Method	Disciplines invoked	Contexts investigated	Theoretical perspectives
1	Conceptual	Conceptual integration of relevance theory into sensemaking literatures	Linguistics	High-reliability organizations	Sensemaking Relevance theory
2	Empirical	Experiments	Linguistics Social psychology	Entrepreneurial funding pitches	Rhetoric Rapport
3	Integrative review	Review of articles on entrepreneurial pitching	Psychology Sociology	Entrepreneurial funding pitches	Several, including perspectives in cognition, communication, and sociolinguistics

Table 1: Dissertation chapters and associated methodologies

1.2 Connecting logic and research questions addressed in each dissertation chapter

The evolution of each dissertation chapter is underpinned by both a cumulative progression in my own thinking, as well as research questions that demanded diverse methodologies to address them. In the first chapter, I leverage a conceptual methodology to understand the role that language plays in scenarios where organizational actors have to rapidly organize in uncertain conditions. Sensemaking scholarship has long investigated the role that language and cognition play in organizational efforts (Cornelissen, Mantere, and Vaara, 2014; Weick, 1979; Weick and Bougon, 1986). However, over the years, language and cognition have generally developed as two separate streams in the sensemaking literature, moving from frames and mental representations (Weick, 1995) to metaphors, narratives, and other verbal or textual accounts (Abolafia, 2010; Boudes and Laroche, 2009).

Given the theoretical distinction between the two bodies of work, there was little research that bridged between the individual and the organization to meaningfully inform how joint sensemaking takes place, particularly in crisis scenarios characterized by significant uncertainty. Thus, although the sensemaking literature has independently elaborated upon the role of individual cognition and shared language in processes of organizing under uncertainty, it lacked the theoretical currency necessary to bring these processes together. Coupled with an interest in building knowledge in sensemaking in HRO contexts, this research gap led me to ask the following research question:

RQ1: What are the communicative mechanisms by which individual cognition and socially shared discourse together constitute joint sensemaking in HRO contexts?

The findings from this first chapter led to the conceptualization of the second chapter of the dissertation. In essence, we conclude that lexical variation (i.e., the use of language that is literal or figurative) is intimately tied to the context and to the inferential spaces that the communicating actors are working from. In other words, when the use of literal codes versus metaphorical language is most effective depends on a range of conditions, such as the goals of the actors, familiarity between actors, and contextual elements, such as ambiguity and equivocality. We find that the relationship between language and ambiguity might not be as straightforward as previously considered by the sensemaking literature, in that the potential for language to mitigate ambiguity depends largely on what the communicative context demands, because ambiguity is exacerbated by both too much and too little information. Ultimately, meaning must be "mutually manifested," where all communicators put in effort to infer what would be most relevant to their listeners prior to communicating, to increase the chances that listeners infer what the speaker intended to convey. In crisis scenarios, both time and attention are limited resources, so inferential effort is all the more critical in achieving communication that aligns with both the speaker's intention, as well as the listener's ability to make the right inference.

Premised upon this critical role of inference in uncertain contexts, I became increasingly interested in the empirical setting of entrepreneurial funding pitches – which is the context for study 2 of this dissertation (Chapter 3). Funding pitches are the "first impressions" that entrepreneurs make in their fundraising efforts, and are therefore strongly characterized by uncertainty, information asymmetry, and high levels of decision risk (Cardon, Mitteness, and Sudek, 2017; Huang and Pearce, 2015). Accordingly, in pitching contexts, how an entrepreneur employs their linguistic repertoire and nonverbal communication in gaining investor favor is particularly salient. Research on funding pitches thus far has generally conceptualized an entrepreneur's communication in a pitch as a process of persuasion (Chen et al., 2009), wherein entrepreneurial (body) language functions to alter investors' opinions, and consequently, their decisions.

Thus, the impetus behind a compelling funding pitch becomes about highlighting positive attributes about the entrepreneur and their venture, like their passion and preparedness (Chen et al., 2009), so that investors are moved to think about the potential profitability of the firm based on these qualities. Simultaneously, owing to the high uncertainty posed by very early-stage entrepreneurial ventures with little "hard" data to show (Lee and Huang, 2018), investors are also known to be concerned about how an entrepreneur might be to interpersonally engage with, particularly in the long run (Kelly and Hay, 2003; Maxwell and Levesque, 2014). Given that the two empirical observations – that entrepreneurs must communicate in a way that convinces investors, and that investors care about more than just an entrepreneur's attributes and achievements – are yet unaligned, I posed the following research question:

RQ2: How do communicated relational cues influence investors' likelihood of making social (i.e., mentorship) and financial (i.e., monetary) commitments to the entrepreneur in a funding pitch?

The deep engagement with the literature on entrepreneurial pitching that this research question necessitated raised new questions. Fundamentally, I found that the body of research that has accumulated on entrepreneurial pitching is multi-disciplinary, with significant theoretical and methodological plurality. While such plurality affords greater diversity in how pitching has been conceptualized over the years, it has also led to theoretical fragmentation, where streams of research develop independently and do not “speak to” one another, to meaningfully inform questions on how the process of pitching unfolds. This lack of an integrative theoretical framework led to the third research question of this dissertation:

RQ3: What are the theories, methods, and assumptions underpinning the research on entrepreneurial pitching since its conception?

1.3 Abstracts of the studies in this dissertation

The following chapters of the dissertation address the three research questions elaborated above. Below are the abstracts of each dissertation chapter that briefly describe the current state of knowledge in the field, the research questions that remain to be answered, methods used in this dissertation to answer the research questions, and key findings and implications.

1.3.1 How can we know what we think until we see what we say? A relevance theory perspective on joint sensemaking in equivocal contexts

We develop a conceptual framework that reveals the communicative mechanisms that underpin cognitive and discursive sensemaking, to explain how shared sense facilitates coordinating in equivocal contexts. Past sensemaking approaches presuppose cognitive effects of discourse, with little attention to how actors make inferences and build shared understanding in context. These approaches therefore overlook how failed inferences may preclude shared understanding from building up, leading to coordination failures. We address this theoretical gap by borrowing theoretical principles and assumptions from relevance theory in the neighboring field of linguistics, and illustrating them with examples from past cases of joint sensemaking under pressure. In doing so, we conceptualize joint sensemaking as a process of constructing a mutual cognitive environment between actors, through the contingent communicative processes of ostension and inference. We discuss the contributions to and implications of our theoretical framework on sensemaking scholarship, elaborating upon equivocality, requisite variety, and double interacts.

1.3.2 Pitching to win hearts: The role of communicated relational cues in entrepreneurial funding pitches

Entrepreneurial communication in funding pitches has long been considered as a transactional resource exchange process by which entrepreneurs convince investors of their qualities through self-presentational tactics. Angel investors on the receiving end of a pitch, however, report looking for more than just the attributes of an entrepreneur, prioritizing instead the 'interpersonal chemistry' and 'collaborative potential' they feel from an interaction when making investment decisions. Building on this existing literature, we introduce a relational view to funding pitches, that considers pitching as an exercise in relationship-building, as an alternative to the traditional model of communication as persuasion. In two experimental studies, we test the effects of verbal and nonverbal relational cues on perceptions of the entrepreneur's coachability, a crucial relational quality, and investors' willingness to make mentorship and monetary commitments to the entrepreneur. Surprisingly, we find that high levels of relational communication, that builds rapport and rhetorical identification between interactants, makes an entrepreneur appear less coachable, and consequently lowers investors' willingness to make social and financial commitments to the entrepreneur. This relationship is further mediated by perceptions of the entrepreneur's humility.

1.3.3 Entrepreneurial Pitching: A Critical Review and Research Agenda

Over the past three decades, research on entrepreneurial pitching has grown significantly, with scholars in management, entrepreneurship, and related disciplines studying various aspects of the communication and decision-making processes surrounding a pitch. Despite the considerable progress made to date, research remains scattered across different literatures, with little attempt at developing a coherent overview of the pitching process, its determinants, and effects. In an effort to offer such a theoretical overview, we reviewed 132 papers published on entrepreneurial pitching since 1986, synthesizing the work to date and charting a course for future research opportunities. Our review identifies two core streams of research that approach pitching from different vantage points; one centred around the entrepreneur, and one where pitching is primarily studied from an investor-centred perspective. We discuss the differences in these approaches, and suggest how they can be brought together in an integrative theoretical framework of the pitching process. Finally, we discuss the contributions of our framework, and propose an agenda for future research focusing on the multifaceted nature of pitching as a communicative process and practice, and on the ways in which theory and research may better inform pedagogy and practice.

1.4 Conclusions and implications

There are three fundamental conclusions that can be drawn from this dissertation:

1. Effects of lexical variation are intimately tied to the context and to the inferential spaces that the communicating actors are working from, and successful communication is often the result of inferential effort (Chapter 2)
2. In funding pitches, investors are more likely to mentor and commit financially to entrepreneurs they perceive as humble and coachable, irrespective of how much entrepreneurs convey their personal and relational qualities (Chapter 3).
3. While the majority of research on entrepreneurial pitching thus far has developed independently from the vantage point of the entrepreneur or the investor, there is value in bringing them together as part of a more encompassing, dynamic, sociolinguistic perspective. Taken together, the communicative framework of pitching developed in the paper offers new questions and leads for further research, and is better positioned to inform pedagogy and practice (Chapter 4).

1.5 Declaration of contribution

I hereby declare my contribution to each chapter of this doctoral dissertation, as well as the contributions of each of my co-authors.

Chapter 2 was written in collaboration with Joep Cornelissen (first submission and revision with the *Journal of Management Studies*) and Pursey Heugens (revision with the *Journal of Management Studies*). I presented this paper at the European Group of Organization Studies (EGOS) conference in Edinburgh in 2019.

Chapter 3 was conceptualized, run, and written by me, and edited by Joep Cornelissen, Pursey Heugens, and Magdalena Cholakova. My co-authors also provided me with extensive feedback over several rounds. I presented this paper at the Strategic Management Society (SMS) conference in 2020 (virtual due to the Covid-19 pandemic), European Group of Organization Studies (EGOS) in 2020 (virtual due to the Covid-19 pandemic), the Babson College of Entrepreneurship Research Conference (BCERC) in Waco, Texas in 2022, and at the Academy of Management (AoM) conference in Seattle, Washington in 2022.

Chapter 4 was conceptualized and written by me, and edited by Nelson Phillips and Joep Cornelissen. My co-authors also provided me with extensive guidance and feedback over the development of the project, both on the proposal and the full manuscript, which is now being revised for the *Academy of Management Annals*, having been accepted in its proposal form in September 2022.

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Chapter 2: How can we know what we think until we see what we say? A relevance theory perspective on joint sensemaking in equivocal contexts

with Joep Cornelissen (RSM) and Pursey Heugens (RSM)

2.1 Introduction

"We are now at takeoff."

"Stand-by for takeoff, I will call you"

"Is he not clear then, that Pan-Am?"

[Scream]

[Collision]

This vignette is taken from transcripts of communications between two airline cockpits and the air traffic controller (ATC) in the Tenerife Air Disaster in 1977, still the deadliest air disaster of all time. Two passenger jets – KLM 4805 and Pan American 1736 – collided on the runway at Tenerife Airport, resulting in the deaths of 583 people. In spite of the complex nature of the disaster, scenarios like the one at Tenerife Airport are sparse in airline travel. Aviation is a high reliability industry, where processes and structures are tightly coupled and routinized, and personnel is extensively trained and hierarchically managed (Weick, Sutcliffe, and Obstfeld, 1999). So how could this accident occur, in spite of organizational constraints? Years of investigations have attributed the crash largely to human factors such as fatigue and distraction of the KLM pilot, contextual factors like fog on the runway, and a deviation from standardized language in communication between the KLM cockpit and the ATC (Roitsch et al, 1977; Weick, 1990). We conjecture that coordinated action can become disrupted when the link connecting individual sensemaking to collective coordination is severed in and through communication.

Since the publication of Karl Weick's *The Social Psychology of Organizing* (1969/1979), sensemaking scholars have focused on dissecting processes of cognition and discourse (Weick, 1979; Weick and Bougon, 1986; Cornelissen, Mantere, and Vaara, 2014). The analysis of these two processes, however, has developed into two separate strands over the years, originally focusing on how individuals create and share frames and mental representations (Weick, 1995; Bogner and Barr, 2000), and evolving from the cognitive strand, a growing body of work that considers sensemaking through metaphors, narratives, and accounts (Boudes and Laroche, 2009; Abolafia, 2010; Colville, Brown, and Pye, 2012; Cornelissen, 2012; Cornelissen et al., 2014). As the field has moved towards a more interactive view of sensemaking, the performative nature of communication has gained traction, proposing that discourse constitutes and enacts macro organizational structures (Dobusch and Schoeneborn, 2015; Quinn and Worline, 2008; Taylor and van Every, 2000; Cooren, Kuhn, Cornelissen, and

Clark, 2011). Weick et al. (2005) adopt Taylor and van Every (2000)'s definition of sensemaking as 'a way station on the road to a consensually constructed, coordinated system of action' (p. 275), thus deftly establishing links between sensemaking, communication, and organized action.

What these past approaches do not fully recognize, however, is that linguistic communication underdetermines mental representations. Language does not fully map onto thoughts, and may be distorted in going from a speaker to a hearer (Reddy, 1975). Sandberg and Tsoukas (2015) highlight this 'conduit metaphor problem of communication' (Lakoff, 1995), in which sense is viewed as something to be 'passed on, [instead of] a skillful activity to be engaged in' (p. 24). Even the more interactional, performative approaches to communication are underpinned by this conduit view, of a performer imposing or transmitting a discourse upon the performed, presupposing certain cognitive effects of discourse (Cornelissen et al., 2015).

The sensemaking literature therefore currently lacks a micro interactional lens to explain how joint sensemaking facilitates coordinated action, particularly in equivocal contexts encountered by high reliability organizations (HROs). The Tenerife air disaster illustration brings to the fore the communication that was constitutive of a failure to coordinate, but was not explicitly recognized as such (Weick, 1990). This leads us to ask: *what are the communicative mechanisms by which individual cognition and socially shared discourse together constitute joint sensemaking in HRO contexts?*

We address this question by considering contributions from the field of pragmatic linguistics, where communicative theories explicitly challenge the conduit model of communication (Reddy, 1975; Sperber and Wilson, 1986). One such theory is relevance theory, developed by Dan Sperber and Deirdre Wilson in 1986. Relevance theory explains how communication in context is contingent upon each conversational participant being able to perceive that what the other is communicating is relevant to them, and vice versa. This is achieved by two fundamental processes: ostension and inference. *Ostension* is the process by which the speaker's intentions are made explicit by stating what is most relevant to the hearer, while *inference* is the process by which the hearer arrives at the speaker's intentions. Being a theory that emerged from pragmatic linguistics, relevance theory shares many of its foundational assumptions with sensemaking (Weick, 1969, 1979, 1995) and contexts of coordination that explicitly rely on verbal communication (cf. Hindmarsh and Pilnick, 2007), but offers a set of conceptual and methodological tools to better track how individuals form inferences in and through communication – a process that is at the heart of many sensemaking scenarios, including classic cases of sensemaking like Tenerife air disaster (Weick, 1990) and the Stockwell tube station shooting (Cornelissen, Mantere and Vaara, 2014).

We theoretically elaborate communicative processes in HRO contexts, assessing how individuals bridge between their own sensemaking of equivocal cues and joint sensemaking with other actors, to enable coordinated action. We argue that sensemaking research is wanting of a theoretical framework that allows us to conceptualize and explain how individuals make inferences and form understandings of cues in context whilst communicating with others. To develop such a framework, we first review extant cognitive, discursive, and performative approaches to sensemaking in HROs. We then highlight the problematic conduit assumption underlying these approaches, and introduce relevance theory and its principles to guide our thinking in moving towards a more communicative perspective on sensemaking. As a result of our theorizing, we develop a conceptual framework that explains coordinated action in HROs by highlighting the interdependencies between linguistic affordances, individual *in situ* interpretations, and contextual assumptions. We theorize and show that joint sensemaking is achieved when individuals infer what is relevant to the other, and explicitly communicate their own interpretations of the evolving context using discursive tools that are most contextually and interpersonally relevant. When communication becomes taken for granted, more equivocality is constituted, precluding a shared sense of the context from emerging, ultimately hindering coordination efforts.

2.2 Joint sensemaking in contexts of high reliability organizing

Sensemaking research examines how individuals and groups in organizations construct an understanding of novel, unexpected, surprising or confusing situations with which they are confronted (Maitlis and Christianson, 2014; Thomas et al., 1993). Sensemaking begins when routine behaviors and familiar understandings are called into question, and the individuals involved ask themselves "what is going on here?" and "what do I do next?" (Weick, 1995; Weick, Sutcliffe, and Obstfeld, 2005). Prior study settings for sensemaking research include entry into organizations, strategy making, product development, strategic change, and industrial crises (Balogun & Johnson, 2004; Gioia & Chittipeddi, 1991; Maitlis, 2005; Stigliani & Ravasi, 2012; Weick, 1988). The literature encompasses both individual and social processes (Maitlis, 2005), retrospective and prospective actions (Stigliani and Ravasi, 2012; Weick et al., 2005), and discursive (Brown and Humphreys, 2003), cognitive (Klein, Moon, and Hoffman, 2006) and behavioral perspectives (Weick, 1988; Sandberg and Tsoukas, 2015).

2.2.1. Cognitive, discursive, and performative approaches to joint sensemaking in HROs

In HRO contexts, sensemaking researchers are concerned with how teams of actors deal with violations of assumptions in environments that are inherently disaster-prone, such as flight decks, nuclear sites, chemical plants, police operations, and wildfires (Weick, 1990; Weick and Roberts, 1993; Perrow, 1984; Weick, 1988; Cornelissen et al., 2014; Weick, 1993). Maitlis and Christianson (2014) discuss how HROs operate, through practices 'that enable members to catch problems early, noticing and acting upon weak cues' which forms 'an organizational culture that encourages sensemaking' (p. 73). HROs are mostly studied at the organizational and societal levels of analysis, with research focusing on systems and cultures that promote or discourage sensemaking (Dunbar and Garud, 2009; Weick and Sutcliffe, 2007), and on the effects of tight and loose coupling of system components on action or inaction (Weick, 1976; Weick, 1988).

The sparse amount of micro-level studies of sensemaking in HROs break down into two streams. The cognitive stream sees sensemaking as the ‘activation’ of cognitive frames that individuals use to categorize and interpret cues from their organizational environment (Weick, 1988; Weick, 1993). The discursive stream has a more social focus, in that it considers language and discourse as the locus of sensemaking, and assesses how frames and accounts are formed and transmitted amongst organization members (Cornelissen et al., 2014; Weick, 1995). The shift away from cognitive to more discursive approaches in sensemaking research signaled a significant interest in how meaning is built up interpersonally (Sandberg and Tsoukas, 2015; Weick and Roberts, 1993).

Some researchers following the discursive turn have suggested that language not only transmits meaning, but also enacts it (e.g. Dunbar and Garud, 2009; Taylor and van Every, 2000), such that ‘situations, organizations, and environments are talked into existence’ (Weick et al., 2005, p. 409). This performative approach to sensemaking is now beginning to be theorized in contexts of coordinated action (e.g. Quinn and Worline, 2008; Weick et al., 2005), where sensemaking is viewed as being ‘constantly (re)produced, (re)incarnated, and (re)embodied in local interactions, and thus subject to change and renewal’ (Cooren et al., 2011; p. 1158; Tsoukas and Chia, 2002). But while performative approaches to joint sensemaking have begun elucidating the constitutive nature of coordinated action, there remains ground to be covered in isolating the communicative mechanisms by which coordination is achieved. The challenge underpinning joint sensemaking is articulated by Weick et al. (2005): ‘When information is distributed among numerous parties, each with a different impression of what is happening, the cost of reconciling these disparate views is high, so discrepancies and ambiguities in outlook persist. Thus, multiple theories develop about what is happening and what needs to be done…’ (p. 418).

The discrepancies in outlook amongst actors that Weick et al. (2005) highlight pose real challenges to coordination when sensemaking breaks down, particularly in high stakes environments like HROs. Actors have different explanations for the question ‘what is going on here?’ and must rely on communication in order to collectively figure out what to do next. The challenge for sensemaking scholarship lies in the independent evolution of the cognitive and discursive streams of sensemaking research as theoretical explanations for failures to coordinate, without much research that considers the mechanisms that unite cognition and discourse as they relate to coordinated action (Quinn and Dutton, 2005). Moreover, sensemaking research continues to rely on the conduit metaphor of communication (Sandberg and Tsoukas, 2015), which positions communication as a channel through which meaning is packaged into discrete units and then exchanged between actors (Reddy, 1975; Sweetser, 1990). By "conduitizing" communication, however, we fail to acknowledge that linguistic structures on their own do not contain meaning; they are symbolic in nature, and it is what they represent to the reader or listener that serves any function in communication (Axley, 1984).

The conduit metaphor leads us astray in that it presupposes a direct effect that stems from the person "authoring" the communication onto the recipient (Taylor and Cooren, 1997), rather than a joint effort to co-create meaning. "Authoring" foregrounds the role of the actors in shaping organizational and institutional reality through a 'pragmatic force of language' that other organizational actors passively undergo (Cornelissen et al., 2015, p.13). It leaves little room for mutual co-authoring, contextual contingencies, and individual actors' beliefs and values (Sandberg and Tsoukas, 2015). Weick and Roberts (1993), for example, describe the transmission of a collective organizational mind from organizational insiders to newcomers through rich narratives they create, but do not detail how insiders infer the contents of the narrative before enacting them. Similarly, in Weick's (1988, 2010) analysis of the disastrous industrial leak at the Union Carbide plant in Bhopal, much of the error is attributed to the supervisor 'replac[ing] the workers' interpretations of the situation with his own' (Sandberg and Tsoukas, 2015, p. 17), and less is known about the processes by which these interpretations were formed or change.

Viewing communication through a conduit thus objectifies "sense" as something that is easily shared between sensemakers and sensegivers (Sandberg and Tsoukas, 2015). Reddy (1979) argues that the metaphor is very beguiling because "when meanings can be *transferred*, as the conduit-metaphorical perspective assumes, there is good reason for self-assurance. Everyone is clearly understood – or at least thinks so" (Axley, 1984: 432; italics added).

2.2.2. Inference as a key process in joint sensemaking

Many past cases of misunderstandings in HROs that led to a failure in sensemaking and coordination highlight the pervasiveness of the conduit assumption in communication (e.g. Perrow, 1981; Cornelissen et al., 2014; Weick, 1990), revealing the gap between an utterance and how it is inferred. The act of making inferences regarding contextual cues is therefore central to coordination. In spite of the significance of inferences, the processes by which such inferences are formed are still poorly understood (Sandberg and Tsoukas, 2015). Part of the difficulty here, as Sutcliffe (2013) suggests, is the tendency to conflate cognition and interpretation, that is, the act of authoring frames with the interpretations afforded by those frames. By squaring intention in the creation of frames with the interpretations that may be inferred from them, meaning is presupposed rather than elaborated contextually.

Studies that bracket off interpretation focus on individual and collectively held cognitive frames (Bartunek, 1984; Balogun and Johnson, 2004; Stigliani and Ravasi, 2012), and on how such frames become constructed and then shared in a collective setting (Stigliani and Ravasi, 2012), or not (Balogun and Johnson, 2004). The main assumption in these studies is that once a frame is activated, it will prompt interpretations, with inferences like cause-effect hypotheses or predictions (Starbuck and Milliken, 1988: 51) automatically following from the structure and contents of the frame (Cornelissen and Werner, 2014). The frame is seen as an interconnected meaning network, derived from individuals' need for a basic plausible structure of the context and a "larger sense of what may be occurring" (Weick, 1995, p. 50). Taken for granted in this view is that plausibility is idiosyncratic to individuals, given that each individual perceives and attends to contextual cues differently, owing to different backgrounds and experiences (Bechky, 2003).

Frame-based inferencing thus does not sufficiently account for the plausible inferences individuals may cognitively make in context (Christianson, 2018; Starbuck and Milliken, 1988). Frames not only allow for a multitude of inferences, but such inferences also still need to be drawn, rather than simply being "read off" a frame. Individuals also frequently conceptualize cues in varied ways, given their own intuitions and embodied responses (Bechky and Okhuysen, 2011; Sandberg and Tsoukas, 2015). In HROs especially, where situational ambiguity may be high, frames may not be readily available to accommodate novel cues, and when they exist, may trigger 'interpretive indeterminacy' (Dunbar and Garud, 2009, p.418). Inferences thus need to be made in the context of the "situationally shaped interactional engagement of sensemakers with one another, and with the events, objects, and artifacts around them" (Sandberg and Tsoukas, 2015, p. 22). Thus, individual idiosyncratic interpretations, and contextual constraints like equivocality that exacerbate them, posit a challenge for coordinated action that is not accounted for by frame-based approaches to inferencing.

Fundamentally, the conduit view that underpins extant approaches to sensemaking contributes to the lack of explanatory power of these approaches in deconstructing the communicative mechanisms by which joint sensemaking leads to coordinated action. Since coordination is a process that is constituted in conversations (Quinn and Dutton, 2005), its study necessitates a micro level theoretical lens that brings in purview how actors form inferences and understandings in context.

Research on joint sensemaking in contexts of coordinated action would therefore benefit from a theory of communication that is inferential in nature, can be applied to *in situ* sensemaking scenarios, incorporates cognitive and discursive processes, and sees intersubjective understanding as being accomplished through joint communicative effort. We argue that an open-ended view of how inferences are formed by individuals as they are communicating with one another, and of how shared sense may be established, follows from seeing the role of discourse as part of a broader communicative process (Clark, 1996). From a communication standpoint, joint sensemaking does not result from a satisfactory matching of cues to available frames (Weick, 1995) or from the direct channeling of cognitive contents from the one person to the other (Balogun and Johnson, 2004; Gioia and Chittipeddi, 1991). Instead, it is an ongoing, moment-by-moment accomplishment that happens as a result of communication in context, where individuals co-construct sensemaking accounts and whereby intersubjective agreements and a "consensually constructed, coordinated system of action" (Taylor and Van Every, 2000: 275) emerges.

Since joint sensemaking involves building intersubjective agreement, a pragmatic communicative approach suggests that any outcome – in the form of individual or collective sense being formed – is unlikely to be isomorphic with the original intentions of the multiple participants engaged in the communication, owing to differences in backgrounds, identities, and situational constraints on perception. As Cooren et al. (2011: 1152) argue, "any performance is as much the product of the agent that/who is deemed performing it as the product of the people who attend and interpret/respond to such performance—analysts included. . . [and thus] any performance will never be reducible to the way it was intended or meant by its producer". Thus, attending to the role of inference in communication will shed light on how failures to coordinate may result from a failure to match a performance to any inference of it. In an effort to augment the under-theorized status of inference in past research on joint sensemaking, in the next section, we elaborate the theoretical backdrop for a novel communicative framework that specializes in how actors make inferences in context, to coordinate for action.

2.3. A relevance theory approach to joint sensemaking in context

To understand how actors form inferences in context, we look to the field of linguistics, which has explicitly challenged the conduit metaphor in favor of a more micro level approach to how meaning is bridged from the individual to the collective (Grice, 1989; Austin, 1975; Sperber and Wilson, 1986). A linguistic theory that brings in this inferential perspective is *relevance theory* (Sperber and Wilson, 1995, 2005). Relevance theory is a theoretical perspective from lexical pragmatics that is premised on how individuals search for meaning in communication contexts, and communicate to help others do the same. When confronted with an utterance or other symbolic clues, individuals search for an inference of optimal relevance to the context, with meaning being established when the inference is considered plausible enough. When an individual does not find an anchor for meaning, ambiguity and incoherence continue to trigger further sensemaking attempts. The individual then has the choice to request conversational partners to repair the utterance and to guide them to the intended inference, or to carry on with the most plausible inference, even if it does not square perfectly with the context. Optimal relevance is thus appraised based on cognitive currency; the most accessible inference is the one that preserves cognitive effort and creates cognitive effect (Sperber and Wilson, 1995). Communication is thus conceptualized as inherently inferential and context-contingent, and reliant on lexical units that comprise discourse, such as metaphors, as “tools” to facilitate the process of inference (Sperber and Wilson, 1995; 2005).

As relevance theory is built on the premise that communication is accomplished through inference and intent (Grice, 1969), it opposes the conduit view (Reddy, 1979) in that it does not presuppose that speaker intent is directly translated to hearer inference. Instead, Sperber and Wilson (1986) propose that an interlocutor communicates with relevance in mind, in that she uses her awareness of what her listener knows to only provide them with the information that they can accommodate using their prior knowledge and contextual cues. Similarly, listeners infer the speaker's communicative intentions through an analogous process of inference.

For relevance theorists, communication is ostensive-inferential in nature, meaning that the act of making an utterance conveys through lexical cues that what is said is worth listening to, thus providing cognitive effects worthy of processing. Through communication, people "[…] settle on interpretations that provide contextually-sufficient cognitive effects with an economy of effort" (Fiddick, Cosmides and Tooby, 2000: p.5), thus establishing meaning. Speakers tend to economize their efforts to afford maximum relevance for the listener, and listeners in turn select and retain the most relevant cues enabling them to effectively respond to the utterance, arriving at meaning in as few conversational turns as possible. Relevance is achieved, as Wilson and Sperber (2004; p.608) elaborate, "when it connects with background information [the listener] has available to yield conclusions that matter to him…by answering a question he had in mind, improving his knowledge on a certain topic, settling a doubt, confirming a suspicion, or correcting a mistaken impression."

2.3.1. Complementarity of relevance theory to past approaches to joint sensemaking

Relevance theory shares a number of theoretical commitments with sensemaking research, making it a compatible theoretical perspective. The first shared commitment is a pragmatic concern with how sense is made in natural contexts (Weick, 1995: 57). A second connection is that both sensemaking and relevance theories are concerned with inferential processes around utterances *in context*, such as the call of a “10 o’clock fire” within Mann Gulch (Weick, 1993) or “stopping” a suspect during a police operation (Cornelissen et al., 2014). A third correspondence is that both perspectives focus on plausibility rather than accuracy (Weick, 1995). Relevance theory seeks to build an account of how individuals make inferences and form plausible understandings in context, guided by individual perceptions and intersubjective assumptions (Wilson and Sperber, 2002). Relevance theory furthermore accommodates cognitive and discursive elements into a micro level framework that positions communication as a joint activity; an ambition that sensemaking scholarship is approaching, but has not yet realized.

Unlike sensemaking in routine organizational contexts, sensemaking in HROs is characterized by actors attempting to resolve equivocalities under time constraints, relying on coordination practices that help produce common understanding. As a theoretical lens that explicates how actors optimize communication toward a mutual cognitive environment without ambiguity or misunderstanding, relevance theory is therefore well-suited for elucidating the processes by which coordination may be accomplished in equivocal contexts.

As further evidence of complementarity between relevance theory and sensemaking research, relevance theory does not challenge the view that sensemaking is a cognitive activity of placing cues within cognitive frames or schemas that enables interpretation (Weick, 1995). Rather, it brings a processual and contextual focus to framing as a social process. The premise of relevance is that "on various social occasions, the expected level of relevance is culturally defined. In the course of a conversation, the level can be adjusted, increased, or decreased, one step at a time. The addressee may make manifest the minimal level of relevance he expects: by adding a question for instance" (Sperber and Wilson, 1995, p. 161). Frames do not come collectively agreed upon, but are rather formed and changed within conversations to meet expectations of relevance. Successful coordination thus takes place in conversations that produce a cognitive representation of the situation that is mutually shared between actors, and can lead to mutually agreed-upon action. Conversely, a breakdown in coordination occurs when actors make different inferences of situational demands, causing ambiguity to persist and hindering a mutual cognitive representation from forming that can guide coordinated action.

2.3.2. Relevance theory: Principles and assumptions

Relevance theory elaborates the notion of 'cognitive environments' as a more dynamic alternative to framing. A cognitive environment is "the set of all the facts that…are manifest to [the hearer]" (Sperber and Wilson, 1995, p. 39). It contains both situation-specific cues and 'chunks' of information that have been assimilated over past experience. Unlike frames, cognitive environments are oft-changing; different facts become salient to the individual as the situation evolves, with interactions with others introducing new contextual assumptions. Cognitive environments complement the idea of cognitive and linguistic frames (Weick, 2010; Cornelissen et al., 2014) by foregrounding the processes by which frames are inferred. The purpose of joint sensemaking, therefore, is to build a *mutual cognitive environment* (Sperber and Wilson, 1995), acknowledging that conversational participants have varying backgrounds, identities, conceptual knowledge, and perceptual differences. In contexts of coordination under pressure, successful coordination is achieved when interlocutors create a mutual cognitive environment that fosters shared understanding, in spite of individual differences in interpretation (Sperber and Wilson, 1986; 1995; p. 38-46).

Relevance theory draws on theories from cognitive psychology, linguistic semantics, and pragmatics (Barsalou, 1987, 1992; Sweetser, 1990; Searle, 1980). Its fundamental argument is that communication is accomplished through processes of ostension and inference that change interactants' mental representations of a situation. *Ostension* is accomplished by the speaker explicitly introducing assumptions to the hearer's cognitive environment, while *inference* enables the hearer to access the intended assumption from other possible interpretations. Wilson and Sperber (2006) define a change in one's cognitive environment as a *cognitive effect*, "a worthwhile difference to the individual's representation of the world" (p. 608). Achieving a mutual cognitive environment means that interactants need to work towards changing each other's individual cognitive environments, such that the same contextual cues become relevant to both parties, in order to facilitate coordination. In sensemaking contexts where time is a limited resource, actors must be able to create cognitive effects through their interactions, such that assumptions are added or changed to match contextual requirements.

Speakers introduce cognitive effects to a hearer's cognitive environment by means of discourse. For the intended cognitive effect to occur, the speaker needs to invest *cognitive effort* in inferring what may be relevant to the hearer, and constructing the utterance accordingly. Communicating based on the hearer's cognitive environment expedites the hearer's access to the speaker's cognitive environment. Hearers also invest cognitive effort in inferring the speaker's intentions, but the more cognitive effort the speaker invests in constructing the utterance, the more ostensive the utterance is, and the less cognitive effort the hearer needs to invest in inferring the intended meaning.

In scenarios where actors need to coordinate under pressure, sensemaking is driven by plausibility and cognitive frugality as environmental inputs become equivocal (e.g. Weick, 1988). Plausible inferencing creates tension between individual appraisals of the situation ("what is going on here?") and how to create a shared understanding in order to collectively overcome the equivocality ("what do *we* do next?"). Moreover, communication is made more challenging because each actor has a different mental representation of the context (Weick et al., 2005; Tsoukas, 1996). Inferences in communication will accordingly also be contingent upon the interpretation that is most plausible. Speakers therefore need to make their utterances even more ostensive, to enable the hearer to access the intended inference, and not to exacerbate situational equivocality by adding more equivocal communicative cues.

Having discussed the complementarity of relevance theory to sensemaking research, and its particular fit for contexts of coordination under pressure, we now move to theorizing how a mutual cognitive environment is built up between actors to facilitate joint sensemaking processes.

2.4. Building a mutual cognitive environment to bridge between cognitive and discursive processes of sensemaking

We argue that coordination efforts are contingent upon the *manifestness*, or explicitness, of a speaker's intentions, such that a hearer can access speaker intentions that may change, confirm, or challenge the hearer's assumptions. These assumptions are then accepted, rejected, or modified by the hearer, in a process akin to what Weick (1969) describes as the double interact (p. 115), and in each case, there is a changed mental representation based on the assumptions the speaker introduces. Correcting false assumptions through conversation helps preclude miscommunications or taken-for-granted assumptions.

In the following sections, we build on the principles and assumptions of relevance theory that we introduced in the previous section, to elaborate a conceptual framework that contextualizes coordination efforts in contexts where actors need to collectively make sense of equivocal cues. As we unfold our arguments, we draw examples from existing studies of sensemaking in HRO contexts, to theorize the communicative mechanisms by which equivocality may be collectively encountered under time pressure. We draw examples from a variety of cases, but focus specifically on conversational vignettes from two cases: the Tenerife air disaster (Weick, 1990), and the Stockwell shooting (Cornelissen et al., 2014). Importantly, both cases feature *in situ* communication processes for the purpose of coordination under equivocal conditions, and provide conversational vignettes that are amenable for re-interpretation from alternate theoretical lenses. Both cases also have a strong processual element to them, describing how in processes of moment-by-moment communication, interlocutors had to recalibrate their understanding to build up common ground and facilitate coordinated action, or in fact failed to do so.

2.4.1. Joint sensemaking outcomes of inferring communicative and informative intentions

In elaborating ostensive-inferential communication, relevance theory distinguishes between the types of intentions that a hearer can infer from a speaker's utterance. The *informative intention* is the speaker's intention to create a cognitive effect in the hearer's cognitive environment, by making specific assumptions manifest, whereas the *communicative intention* is the speaker's intention to inform the hearer of one's informative intention (Wilson and Sperber, 2002). An ostensive utterance is one that makes both types of intentions explicit. Inferring a speaker's informative intentions creates cognitive effects in a hearer's cognitive environment. Intentions are therefore crucial cues for an actor to access the other's sensemaking. We argue that in highly pressured contexts, the accessibility of both the communicative and informative intentions of the speaker is crucial for interpretative congruence across actors, to be able to perform interdependent tasks and mitigate equivocality.

If a speaker's utterance is not ostensive enough, however, the intended meaning may still be retrieved through cognitive effort made by the hearer, through the process of repair (Schegloff, Jefferson, & Sacks, 1977). For instance, in the case of the Tenerife air disaster (Weick, 1990), when the

KLM pilot could not infer what the co-pilot had asked, he inquires, "what do you say?" In such repair requests, the utterance must be ostensive enough to contain both the communicative and informative intention, as is also the case in the response to the repair request, and so on. A repair request is like any other ostensive utterance: it is only as effective as it demonstrates to the hearer what the speaker needs in order for understanding. The informative intention here is that the pilot did not hear or understand what was said, and the communicative intention is to make the informative intention known to the flight engineer. The more ostensive a communicative turn, the less it necessitates future communicative turns, and the sooner actors are able to 'converge cause maps' and coordinate successfully (Sandberg and Tsoukas, 2015; Weick, 1979). In contexts where joint sense must be made in limited time, that is the nature of most sensemaking cases in HROs, being able to make one's communicative and informative intentions explicit is an essential coordination skill that preserves cognitive frugality and expedites action.

When encountering equivocality in context, an actor notices and brackets the cue as discrepant (Weick, 1995), and through ostensive utterances, can share her sensemaking with other actors. The informative intention here is to inform others of the fact that she perceives the cue as discrepant, not merely highlighting a discrepant cue. If the cue is surprising to others as well, it triggers a process of collectively building a reasoning for the discrepancy, to then develop a means for coordinated action. Accessing communicative and informative intentions promotes learning, and building ostensive utterances allows actors to verbalize their sensemaking, without taking for granted the cognitive environments of the other interactants. The ostensive-inferential process of communication therefore helps actors to share individual appraisals of situations to invite others to contribute sensemaking efforts to build a collective picture on how to overcome the equivocality.

When both types of intentions are manifest, a mutual cognitive environment is created wherein all interactants mentally represent the same contextual assumptions that need to be acted upon (Sperber and Wilson, 1986). This was the case in the communication between the KLM pilot and co-pilot. When the co-pilot notices the pilot begin a takeoff sequence, he interjects, “wait a minute, we do not have an ATC clearance.” This utterance makes the pilot stop the takeoff sequence and tell the co-pilot to ask for clearance. Noticing the movements towards takeoff, the co-pilot could have observed, “you are moving the throttles,” but that would not have made his informative intentions manifest, and would not have been as relevant to the pilot. Ostension in the co-pilot's utterance highlights both the mindfulness of relevance to the pilot (i.e., what the pilot is attending to at the time, maneuvering to get the plane into the air), and reflective of his own concern of taking off without ATC clearance. The pilot was able to infer both intentions, because he then did stop his actions, and told the co-pilot to ask for clearance.

Coordination failures become more common when the speaker's communicative intention is manifest, but the informative intention is not. When the speaker's communicative intention is manifest, it signals to the hearer that the speaker would like to communicate something to them, with the actual message still being open to multiple inferences. In equivocal contexts, we contend that it is insufficient to only be able to infer the speaker's communicative intention, because the informative intention is then either taken for granted, assuming that the speaker would have clarified it if it were important, or the hearer explicitly requests the speaker to repair the utterance. Taken-for-grantedness is particularly dangerous in HRO contexts; it is particularly difficult for tightly-coupled processes in HROs to adapt to more equivocality generates by partially inferred cues. Ostensive repair requests give the speaker another opportunity to make their intentions manifest. Repair requests are cognitively effortful, and if the request does not result access to the speaker's informative intentions, lowers the probability that the speaker will make the same request again, while simultaneously performing other organizational tasks.

We see evidence of a repair request that was not ostensive enough in the Tenerife case. Seconds before the plane crashed, the KLM flight engineer notices from the radio transmissions between the ATC and the Pan Am plane that the Pan Am plane is still on the takeoff runway. He asks the pilot, 'is he not clear then?' The utterance made the flight engineer's communicative intention manifest to the pilot, as it was a direct question, but the informative intention – that the pilot should hold off from takeoff – was not manifest. What the flight engineer had not inferred was that the pilot did not know that the Pan Am plane was on the runway; he was distracted in maneuvering the plane throughout the communications between ATC and Pan Am. When the pilot requests repair, ("what do you say?"), because the flight engineer had not successfully inferred this fundamental assumption that was missing from the pilot's cognitive environment of Pan Am being on the runway, he was not able to repair the first utterance successfully. He appends it by adding ‘that Pan American,’ to which the pilot replies with certainty, ‘oh yes!’ because he had thus far not attended to cues to the contrary. The pilot does not request repair again, though he still could not access the flight engineer’s informative intentions, because the first repair request still did not make the assumptions in the utterance relevant to his cognitive environment. He therefore responds to the question by deferring to assumptions he already has, and takes further inferencing for granted.

The alternative outcome to requesting repair to an utterance where the inferential intention is not ostensive enough is taken-for-grantedness. In the Stockwell shooting case (Cornelissen et al., 2014), Pat, in the control room, liaises with James, one of the surveillance officers, and pushes James to answer a question that James initially finds ridiculous (“can anyone give me a percentage of identification?”). James is unable to infer Pat’s informative intention, that Pat was looking for a response from James to pass along to the commander of the operation, who was under pressure to decide a course of action. Instead of requesting repair to Pat’s question, James responds, “for what it’s worth, I think it’s him.” The response is tentative in nature, and telling of James’ uncertainty. However due to the distributed nature of the communication, this uncertainty is not made manifest to Pat, who infers that the man in pursuit is actually the suspect, Nettle Tip. Importantly, though Pat was not on the scene, he had developed a sense that Jean Charles de Menezes (JCM; the man in pursuit) was Nettle Tip – an assumption based on intuition and the descriptions he had heard from the surveillance officers. But Pat had not heard anything as definitive as the utterance he conveys to Commander Dick after hearing from James, “it is him, the man off [the] bus. They think it is him, and he is very, very jumpy.” Communicative indeterminacy is reflected here; when actors take the informative intention of the speaker for granted, communication becomes akin to a game of telephone, where meaning becomes easily distorted. In these two conversational turns, more ostensive utterance constructions would have challenged embodied presumptions with observations that are more contextually-grounded (Weick, 1988; Weick, 1993). We discuss discursive tools that can be used to build ostensive utterances in the next section.

In the infrequent cases where the speaker’s informative intention may be inferred without their communicative intention being manifest, equivocality ensues without opportunities for repair. Though this outcome is less common, given that utterances come with a presumption of their own optimal relevance (Wilson and Sperber, 2002), there are scenarios where hearers have expectations of the speaker's informative intention, even if the speaker does not make this intention ostensive. The process of inferring an informative intention without a communicative intention is cognitively expensive, and for the right inference to result, necessitates a great knowledge of the speaker's cognitive environment. An example of such a case where hearers falsely infer a speaker's communicative intention occurs in the Three Mile Island nuclear disaster (Perrow, 1981). In this case, there is an instance where the engineering team repeatedly tries to reach out to the head of customer service, Mr. Karrasch, about a faulty valve, but receives no response. When finally chancing upon Mr. Karrasch at the water cooler, he responds, "it's okay, no problem," and leaves in a hurry. This creates great equivocality for the engineering team: "did it mean there was no problem of getting solid, or no problem of uncovering the core, or what?" (p. 20). The team notices Mr. Karrasch leave in a hurry, signaling that he does not wish to communicate, an assumption made stronger by the fact that he had not responded to previous requests of the same. He still communicates, however, and the informative intention of the utterance that is made manifest to the engineering team, in spite of no communicative intention to make this assumption manifest, is that there was in fact no problem. This inference falsely assuaged the concerns of the engineers, and the context did not provide opportunities to request repair, leaving the status quo equivocal, without a shared sense as to whether there was a problem, and how to coordinate to solve it.

Finally, there are communicative cues that are not accompanied by communicative or informative intentions, but because they are not made ostensive, they do not become manifest in the mutual cognitive environment. These are lost cues, wherein contextual elements were individually, cognitively made sense of, but were not discursively shared. The distorted radio transmission between the ATC and the Pan American cockpit is one example where ostensive discursive cues were lost ('And we're still taxiing down the runway, the clipper one seven three six') and did not manage to change the cognitive environment of the KLM pilot. In the case of the Stockwell shooting, surveillance officer Ivor notices JCM, the potential suicide bomber, pick up a Metro newspaper at the Stockwell tube station – an act that he makes sense of as inconsistent with the behavior of a suspected suicide bomber. However, he does not communicate this cue or make his intentions salient to the others, and thus does not contribute to the mutual cognitive environment that may have altered the assumptions of other actors, and put them on a different course of coordinated action.

Table 1 illustrates the joint sensemaking outcomes when none, one, or both types of intention are manifest to the hearer, illustrated with examples from past cases of sensemaking under pressure. By elaborating upon communicative and informative intentions, we highlight the joint sensemaking outcomes that result when both intentions are manifest or not. The outcomes range from not establishing a mutual cognitive environment at all (when both intentions are not manifest), to a request for repair or taken-for-grantedness (when the communicative intention is manifest but the informative intention is not) to pervasive equivocality (when the informative intention is manifest but the communicative intention is not), to achieving a mutual cognitive environment (when both intentions are manifest). Situational equivocality is exacerbated when both types of intentions are not manifest to the hearer, and only when they are manifest, does joint sensemaking begin to happen. Given the cognitive effort necessary for constructing utterances where both types of intentions are manifest to the hearer, scenarios of joint sensemaking under pressure necessitate the use of appropriate discursive implements for creating a mutual cognitive environment. In the next section, we theorize further about these discursive tools, building on the principles of conceptual and procedural meaning afforded by language.

Insert Table 1 here

2.4.2. Building ostensive utterances through contextually relevant discursive tools

Relevance theory proposes that every communicative utterance affords a certain conceptual and procedural meaning (Infantidou, 2005). Conceptual meaning is retrieved by mentally connecting the word or phrase in the utterance to its conceptual category, while procedural meaning is retrieved from expressions that guide the hearer down a specific inferential path. For example, the Weickian maxim "How can I know what I think until I see what I say?" contains words that serve as concepts with conventional, encyclopedic meaning to them, but the word 'until' is additionally a procedure that helps the reader make sense of the two clauses. 'Until' also time-orders the clauses, instructing readers to interpret the first clause by the conceptual meaning of the second. The intended inference of this utterance, however, cannot be arrived at only through its conceptual and procedural meanings; its inference is also contingent upon knowledge of the context.

Students of sensemaking scholarship can therefore better infer Weick's informative intention behind this utterance than a lay reader.

2.4.3. Building ostensive utterances through inferential broadening and narrowing

Inferential differences in conceptual meaning can be drawn out on a linguistic continuum at the lexical level of communication, highlighting words and phrases (Wilson, 2011). Some types of discourse afford more inferences of their conceptual meaning than others based on the accessibility of their encyclopedic concepts, but their interpretation itself is contingent on contextual and relational factors. Even utterances deemed obvious in meaning by one may not be inferred the same way by another (Garfinkel, 1967, 1987), without mediating processes of relevance. The linguistic continuum we highlight ranges from literal, to loose, to metaphorical, to hyperbolic language (Wilson, 2011), and we discuss their inferential affordances in terms of situational and relational elements of coordination. This continuum specifies a difference between language that inherently affords few interpretations (i.e., literal) to language that affords multiple interpretations (i.e., hyperbolic) in a given situation (Daft and Wiginton, 1979). With this continuum in mind, an interlocutor's choice of language is one of inferential pragmatism; more literal language narrows the inferential space for the listener, such that not many interpretations are afforded and her/his inferential space is narrowed or closed down, whereas more figurative language broadens the inferential space, thereby opening up more possibilities for interpretation and cognition (Wilson, 2003; Wilson and Carston, 2007). Greater interpersonal familiarity between interactants affords looser language in coordination, because past shared experiences create common ground between interactants that facilitates inference, whereas interactants who do not have a shared history face the challenge of unfamiliarity with what may be personally relevant to the other (Weick, 1993). Looser language in such contexts therefore poses a greater threat to speaker intention squaring with hearer inference.

The choice for looser or more literal language has not always obvious in past sensemaking research in HROs. Weick and Roberts (1993), for example, advocate for figurative, idiomatic language to allow improvisation on flight decks, while Weick et al. (1999) highlight the importance of scripted language to maintain consistency and reliability. Less accounted for in the literature on coordination is the role of context in determining which type of language will produce the best inferential outcome. We elucidate the role of context in joint sensemaking processes by considering the linguistic continuum through the principles of inferential broadening and narrowing (Wilson and Carston, 2007). Broadening or narrowing the other's inferential space through language, then, is a pragmatic choice on how best to arrive at a mutual cognitive environment with the most cognitive frugality.

Communication in HRO contexts is also made more complex because teams are ephemeral and communication is distributed, in addition to the pressure imposed by a shortage of time and gravity of errors. Ephemeral teamwork precludes personal familiarity from building up, and actors therefore only have access to generic inferences of the roles and experiences of other actors. Having to coordinate from different locations poses an additional challenge, in that actors now also perceive different contextual cues as relevant. Keeping these constraints to HRO sensemaking in mind, we elaborate upon how inferential space may be broadened or narrowed pragmatically, using illustrations from the Stockwell shooting case (Cornelissen et al., 2014).

The conversational excerpts from this case show various instances where Commander Dick, the commander leading the operation, uses language that broadens the inferential space for the officers who are already uncertain whether the man they are pursuing, Jean Charles de Menezes (JCM) was the suspect or not. There was a misattribution of inference across the parties: the control room could not infer the embodied sense of uncertainty of the actors on the ground, and the officers on the ground did not infer that those in the control room did not have access to the more material aspects of the operation, and could thereby not provide directives with certainty. Moreover, the utterances shared between actors over radio underdetermined each party's informative intentions (Carston, 2002), while the equivocality of the environment made actors over-reliant on the other party for contextual information (for Commander Dick), or for a determined course of action (for the surveillance officers).

After hearing a few behavioral descriptions about JCM, Commander Dick asks for a 'percentage of identification,' a scripted phrase used at police stations to ask a witness how confident they are that a person in a police line-up is the perpetrator. Scripted language is considered to reduce ambiguity by creating predictability in procedures of HROs (Weick et al., 1999; Weick and Sutcliffe, 2007). However, the present context was one of diffuse uncertainty: the potential suspect was on the move, and the officers could not discern a comparison between the photo of the suspect and JCM (Cornelissen et al., 2014). Different contexts render the same expression to be inferred in different ways, and the conceptual meaning of a ‘percentage of identification’ could not be accessed by comparing it to past concepts that were relevant in similar situations. ‘Percentage of identification’ therefore broadened James’ inferential space, and he could not access the Commander’s informative intention that she needed more precise information from the officers in order to issue a directive. The inferentially broad utterance triggered sensemaking in the direction of forming a declarative appraisal (“for what it’s worth I think it’s him”) which precipitated mindless action, with each actor involved having disparate mental representations of the situation, and no consensus on how to coordinate.

In requesting information, as Commander Dick tries to do, inferential narrowing is a more appropriate discursive tactic, so that the absent assumptions become mutually relevant to all parties, and further repair may occur. However, inferential narrowing may also lead to a taken-for-grantedness of shared assumptions, if the conceptual meaning derived from the narrowing does not match the context. This is evidenced when Pat passes along James' tentative utterance of 'for what it's worth I think it's him' to Commander Dick as 'it is him, the man off [the] bus.' The literal language in the utterance conceptually encodes the meaning that JCM is the suspect, but this does not map onto the uncertainty rife among the officers, or the tentative nature of James' utterance. A narrow inferential space made the false assumptions by Pat more manifest for the Commander, and she prescribed future directives in accordance with these manifest assumptions. In contexts of coordination under pressure, as the most plausible inferences are considered to be the most accurate ones, narrowing the commander's inferential space was a dangerous communicative step that fed into her sensemaking that JCM was the suspect.

Processes of inferential broadening and narrowing thus explain how discourse constrains or enables coordinated action based on its fit with contextual assumptions that are needed for joint sensemaking. In some organizational circumstances, speakers may decide to keep the encoded contents strategically ambiguous – such as in visionary speech or abstract goal-related information (see, e.g., Donnelon et al., 1986; but also Carton, 2018) – to allow interpretive freedom to recipients. The goal in HRO contexts, however, is coordination. Inferentially broad utterances in these contexts, as in the example from the Stockwell shooting, may result in pseudo-coordination, where everyone assumes they are on the same page. The strategies used to achieve this goal must thus be oriented towards building one's utterances to be as inferentially broad or narrow by primarily inferring contextual relevance. In the next section, we elaborate upon procedural meaning, another discursive tool for inferential broadening and narrowing.

2.4.4. Building ostensive utterances through procedural expressions

Procedural expressions are linguistic tools that contextualize conceptual expressions by signaling a logic through which the utterance must be interpreted. 'If,' for example, 'if' takes the hearer onto a conditional path where some elements of an utterance are contingent upon other elements of the utterance, while 'and' makes the hearer anticipate future clauses or categorize multiple clauses as representative of one class, for instance. Procedural expressions like 'if' (and 'nevertheless,' 'but,' 'so,' and 'and,' amongst several others) are known as *discourse markers*, and they help narrow the gap between the speaker's intention and the hearer's inference by providing additional interpretive aids (Blakemore, 1988; Blakemore 1989).

Discourse markers can therefore both narrow and broaden the range of interpretations an utterance affords, depending on the context of their usage.

We illustrate the inferential utility of discourse markers by unpacking the interaction below between the KLM cockpit and the ATC in the Tenerife air disaster (Weick, 1990). In issuing a directive, the ATC actually issues six directives, without appropriate discourse markers that signal what it is KLM is expected to do first. The procedurally relevant discourse markers 'after' and 'until' signal to the KLM cockpit that the 'take-off' part of the directive is in the past, with the majority of the directives indicating what to do once the KLM plane is in the air. The lack of relevant discourse markers reinforces the interpretation that takeoff clearance had been given by the ATC ('you are cleared'), foregrounding a future course of action. In reading back the directive to the ATC, the KLM co-pilot repeats the same procedural expressions, and adds 'we are now at takeoff.' While the expression 'at takeoff' has been spotlighted for its approximate nature (Weick, 1990),

ATC: KLM eight seven zero five uh you are cleared to the Papa Beacon climb to **and** maintain flight level nine zero right turn **after** take-off proceed **with** heading zero four zero **until** intercepting the three two five radial from Las Palmas VOR

KLM co-pilot: Ah, roger, sir, we're cleared to the Papa Beacon flight level nine zero, right turn out zero four zero **until** intercepting the three two five **and** we're now **at** takeoff procedurally speaking, it is well in-line with the directives it is used in response to. The inferential breadth afforded by ‘at’ takeoff suggests both that the KLM plane is in takeoff position, and that they are ready to perform the remainder of the directives: which is what the ATC had instructed.

In addition to discourse markers, procedural meaning is also facilitated by *referents*, expressions such as proper nouns that distinguish the person or object that is being referred to from the class of objects they belong to, which narrow the possible interpretations. For example, ‘Karl’ affords fewer inferences, depending on how many Karl’s are mutually known between interlocutors, as opposed to ‘he.’ Referents trigger relevance for the hearer by making manifest exactly the subject or object that is the target of a given assumption, sparing the hearer the cognitive effort of searching for the right inference. Referents become crucial in contexts of distributed communication, in which actors are not co-located but still need to coordinate for action. Even when actors are not dispersed, they each have their own manifest assumptions of the same context, which makes referents a critical communicative device in general (Hedley, 2005). Overcoming the constraints of distributed communication to coordinate in equivocal contexts, however, necessitates the deliberate use of referents.

The failure to coordinate in the Tenerife air disaster was in part due to taking the distributed nature of communication for granted, and failing to use specific referents. For instance, following Pan Am's interjection ('No…eh') to KLM's readback that they were 'at takeoff', the ATC issues the directive 'Stand by for take off, I will call you.' Since this communication was issued on a radio frequency shared by all planes at the airport, 'you' could have referred to any plane. To Pan Am, who was aware about and made uncomfortable by KLM's presence on the same runway, the manifest assumption was that the directive could have been for either party (Clark and Bangerter, 2004). Recognizing this indeterminacy, and to narrow the inferential space for all parties, Pan Am therefore adds, 'and we're still taxiing down the runway, the clipper one seven three six.' Pan Am invokes an identifying proper noun, to make ostensive their informative intention: that they were on the takeoff runway that the KLM plane was trying to take off on. Lamentably, this utterance was also not heard in the KLM cockpit, the party to whom its assumptions would have been most relevant. The ATC did access Pan Am's informative intention, but in their affirmative, changed Pan Am's identifier from 'clipper one seven three six' to 'Papa Alpha one seven three six.' Although invoking a proper noun made their intentions manifest to Pan Am, to KLM, this was a new identifier, given that the ATC had addressed the Pan Am plane as 'clipper' in all previous communication, and as such makes the inference that the ATC could be referring to a different plane available (Roitsch et al., 1979; Weick, 1990). This broadens the inferential space once more, particularly of the actors that were not attending to the radio communications (the KLM pilot and co-pilot), and it becomes taken for granted as part of the noise of radio transmission, rather than signal. Thus, referents do not automatically narrow an inferential space; contextual constraints, such as previous utterances dictate the inferential outcome of any discursive tool.

2.5. Discussion

Our main aim in this paper was to theorize upon the question, *what are the communicative mechanisms by which individual cognition and socially shared discourse together constitute joint sensemaking in HRO contexts?* To this end, we developed a conceptual framework (see Figure 1) showcasing the ostensive-inferential processes leading to joint sensemaking for coordinated action. The framework showcases how cognitive, contextual and linguistic affordances constrain or enable communicative processes, in building a mutual cognitive environment that contains shared assumptions.

Ostensive-inferential communication is characterized by the congruence between the addressee's cognitive environment, the context at hand, and the linguistic affordances of the discursive tools used. The methodological implications of this framework are that it can be used to empirically trace the development of joint sense *in situ* by examining the presence or absence of the constituents of this framework, in achieving a mutual cognitive environment. No micro-processual lens to trace discourse has thus far been applied to contexts of joint sensemaking under pressure, and this framework therefore offers a novel approach to perform contextually grounded discursive analyses.

Insert Figure 1 here

Ostensive-inferential communication is also facilitated by shared history among actors. Past work on sensemaking in HROs showcases transient teams (Weick, 1993; Perrow, 1984), that lack opportunities to communicate with one another, thus precluding them from making informed inferences of each other's intentions. Ephemeral teams do not afford familiarity, and routine tasks do not necessitate it (Hindmarsh and Pilnick, 2007). However, in non-routine scenarios where ambiguity is high and cognitive resources are limited, shared history facilitates communicative processes through shared language and repertoires that have developed over time (Weick, 1993; cf. Quinn & Worline, 2008). Ephemeral teams then face the challenge of communicating with the assumption that each person's appraisal of the situation is different (e.g. Weick and Roberts, 1993; Cornelissen et al., 2014; Weick, 1990). In other words, there is no meta-representation of the situation (i.e. 'they know what I know') to rely on, and hence communication becomes more effortful.

As we have demonstrated in this paper, coordination is both communication-contingent and context-contingent, even if teams have a shared history. This lends a new focus to Weick (1979)'s notion of requisite variety, that 'it takes complexity to register complexity' (Weick, 2015, p. 192): is requisite variety a facet of organizing that also needs to be interpersonally developed? Our framework thus raises the question as to whether teams that have worked together in a variety of complex scenarios develop means by which to build a mutual cognitive environment that are not cognitively expensive (see also Faraj & Xiao, 2006). Relevance theory would support the notion of *shared requisite variety* to facilitate coordination, as interpersonal history lays the foundations for a mutual cognitive environment and precludes the need for cognitively effortful tasks such as extensive repair work, or the alternative outcome of a taken-for-grantedness of meaning.

Our relevance theoretic lens also sheds new light on equivocality. Weick and others have, over the years, written about equivocality at the organizational level, where equivocal cues are noticed and bracketed cognitively, and made sense of discursively, through frames, narratives and metaphors (Weick, 1995; Abolafia, 2010; Brown et al., 2008; Patriotta, 2003; Cornelissen et al., 2014). Not much attention has been paid to how communication may constitute this equivocality, however, when speaker intention and hearer inference do not square with one another. Some examples where communication constituted equivocality are when the air traffic controller explicitly states 'you are cleared' when requested for a takeoff clearance, and when Commander Dick uses scripted language that was unfit for the context.

Our ostensive-inferential framework also sheds light on the notion of sensegiving. Sensegiving has largely been studied as a strategic activity, where an individual attempts to orient an addressee towards a desired sensemaking outcome (Gioia and Chittipeddi, 1991; Maitlis and Lawrence, 2007; Rouleau, 2005; Cornelissen, Clarke, and Cienki, 2010). From an ostensive-inferential perspective of communication, efforts by speakers to create cognitive effects in a hearer can be considered sensegiving; however, these efforts are contingent upon knowledge of the other's cognitive environment, contextual constraints, and the types of discursive tools used. Thus, sensegiving in contexts of coordination under pressure cannot be parsed from sensemaking, as successful communication entails that the speaker first make sense of the 'sensemaker's' cognitive environment (inference) in order to make the intended assumptions relevant (ostension). This process is akin to what Sandberg and Tsoukas (2015) describe, where '[…] individuals are coupled with one another and the world, creating sense out of whatever material are available to them (including each other's utterances). A "sensegiver" is also a "sensemaker," and vice versa; the two cannot be separated' (p. 24). Sensegiving has not received much attention outside strategy or entrepreneurship contexts, but the theoretical vocabulary offered by relevance theory affords a more in-depth exploration of how sensegiving may be accomplished when there is no strategic outcome at stake, and both parties' interests are in mind. Studying sensegiving at a more micro level of analysis also adds explanatory power to the concept; one way of studying sensegiving ostensive-inferentially is to gauge how much information a sensegiver needs to reveal in order for the sensemaker to accept their vision. Our framework highlights the importance of explicitly stating one's sensemaking of a situation in order for joint sensemaking in an equivocal context, but many scenarios where sensegiving is evidenced afford actors time to construct utterances strategically. Thus, further exploration using an ostensive-inferential framework could reveal how cues can be relevant to a sensemaker without revealing the strategic intentions of the sensegiver.

2.5.1. Theoretical implications

We mobilized relevance theory from linguistics to theoretically model and explain how actors move between cognition and discourse to form inferences and be able to coordinate in contexts of joint sensemaking under pressure. As relevance theory arose out of pragmatics within linguistics, it is as a theory particularly adept at identifying inferences that stem from, and are triggered by, discursive utterances in context. Many scenarios of coordinated action are characterized by utterances that set off joint sensemaking processes – ranging from Weick's re-analyses of the Bhopal (1988, 2010) and Mann Gulch (1993) disasters, and Snook's (2000) study of a friendly-fire shooting in Iraq. In each of these cases, key utterances such as "a factory that's stopped," a "10 o'clock fire," and "hits there" – include expressions that afford conceptual and procedural meanings, and trigger inference about the speaker's communicative and informative intentions. The table we have developed on the inferential outcomes of joint sensemaking efforts (Table I) can be used to model communicative dynamics in sensemaking scenarios, to pinpoint exactly where cognition does not square with discourse, and what discursive tools for ostension can be used to overcome this gap to create a mutual cognitive environment. This mutual cognitive environment would contain the same assumptions across actors, so that each actor has the same representation of the question that precedes sensemaking activity, 'what is going on here?', so as to then be able to coordinate about what to do next, updating this joint sensemaking as the context unfolds.

The introduction of relevance theory also implies a reconsideration of sensemaking concepts such as individual frame-based inferencing and coordination practices, but from a communicative, as opposed to a strict discursive or cognitive, perspective. Weick (1995) defined sensemaking as matching cues to existing frames to enable interpretation (see also Sutcliffe, 2013). From a relevance theory perspective, however, interlocutors importantly also make inferences of conveyed intentions and utterances towards one another and the contingencies of the situation. They may not infer fully formed frames – as packages of ideas, structuring their expectations – in context, due to the presence of discrepant cues. There may also not be any prior frames, based on prior experiences, to draw on, particularly in a shared sense. Whilst there may be routine circumstances in which individuals are able to infer a standard frame, in many other instances their inferences may simply be over a set of observed cues and intuitively connected to some embodied reflexes and a distributed discursive environment. From a pragmatic perspective, sensemaking is about relevant, or plausible, inferences that individuals jointly make in context, and in response to expressed utterances, and is not limited to circumstances where individuals are able to infer broader frames.

Relevance theory additionally deepens our understanding of the role and potential effects of literal versus figurative language on sensemaking processes, a theme that has been implicit in much of prior sensemaking research. Prior work by Weick and colleagues (Weick et al., 1999; Weick and Sutcliffe, 2007) singled out the role of literal codes within HRO settings as on the one hand allowing for clarity and predictability in procedures but at the same time stymying the possibility of improvised action in context.

Weick and colleagues instead celebrate the role of looser, more figurative language such as idioms and metaphors for coordination in HRO settings. The principles of conceptual and procedural meaning in utterances and the accompanying example from the Stockwell case suggest, however, that we should be careful with projecting such a general role onto more figurative language in general out of context. Rather than reifying particular effects that literal or figurative language may have in particular contexts into general discourse-related qualities, the effects of lexical variation are intimately tied to the context and to the inferential spaces that the communicating actors are working from. The same principle effectively applies to the assumed role and effect of literal codes. In equivocal contexts, codes may be used as procedural expressions, as they add redundancy to conceptual expressions and expedite inferential processes, but like other procedural expressions, they cannot be used alone to manifest meaning. By the same logic, we cannot assume a generally restrictive effect emanating from codes, but must consider them as discursive tools that can mold inferences to the context.

2.5.2. Future research

Building on these contributions, future research could usefully re-examine existing sensemaking concepts, such as equivocality, requisite variety, and the double interact, from a relevance theory perspective. To give one example, equivocality can be recast in relevance theoretic terms to model, at the micro interactional level, extant contextual equivocality with the equivocality that is constituted in discourse whilst making sense of the perceived equivocality.

Although we illustrate principles through examples from HRO cases, based on the theoretical vocabulary developed in this paper, future research could apply the theoretical framework to empirical contexts, and variably model the constituents of the framework with coordination outcomes. For example conversation analysis using communicative and informative intentions as guiding principles would provide significant empirical substantiation to these theoretical conceptualizations. Additionally, the framework developed here may be built on methodologically, by designing ethnomethodological or conversation analytic tools that can access patterns of ostension and inference and their joint sensemaking outcomes. Such approaches would widen the micro analytic focus we mobilize in this study, and promote approaches that focus on cleaving cognitive mechanisms from discursive ones, rather than conflating them.

Given our explicit focus on sensemaking in HROs, our approach only considers outcomes of coordination failures and the sensemaking processes that lead to these failures. Though we theorize alternative discursive choices that would have changed failed coordination outcomes, future studies would benefit from collecting and examining conversational data in contexts where failed outcomes may have been avoided, to add a comparative focus.

Another example of a concept to fruitfully re-examine in future research based on the contributions of the present study is the double interact, that has thus far not had much empirical utility as a theoretical construct, though introduced in the 1980s. Scenarios of coordination under pressure can be modeled to trace how ‘patterns of interlocked behavior’ (Weick, 1969, p. 90) emerge out of micro interactions to acculturate HRO practices such as a ‘preoccupation with failure’ (Weick and Sutcliffe, 2015). Modeling these scenarios on a micro-interactional level may reveal the double interact to not be as well-suited as a ‘basic building block of organizing’ (p. 110) favoring more complex communicative approaches that consider the processes that underpin the move from act to interact to double interact. For instance, our framework elaborates the repair work and the ostensive-inferential processes by which assumptions are introduced, modified, accepted, or rejected between interlocutors, suggesting that the double interact may be too basic a building block to explain higher order processes of coordination, particularly in HRO contexts. Finally, the concept of shared requisite variety should be explored further to elucidate whether a more complex mutual cognitive environment is more adept to the complexity and dynamics of the situation that actors are jointly making sense of. These avenues can be usefully pursued through our relevance theory inspired framework, offering the potential to enrich our understanding of Weickian notions of sensemaking and coordination from a micro interactional perspective that is contextually grounded.

2.6. Conclusion

We have drawn on relevance theory to offer a communicative perspective of scenarios of sensemaking and coordination under pressure that provides a more nuanced conceptualizing of how joint sensemaking facilitate may coordinated action. Contrary to the view that meaning is presupposed in discourse, our paper highlights that acts of communication in organizational settings are purposive and effortful, and when such effort is not invested into constructing a communicative utterance following the principles of ostension and inference outlined by relevance theory, there is added contextual equivocality to contend with. Ultimately, coordination is contingent upon the use of discursive tools to build utterances that make the speaker's intentions explicit, and that are contextually and optimally relevant to the listener.

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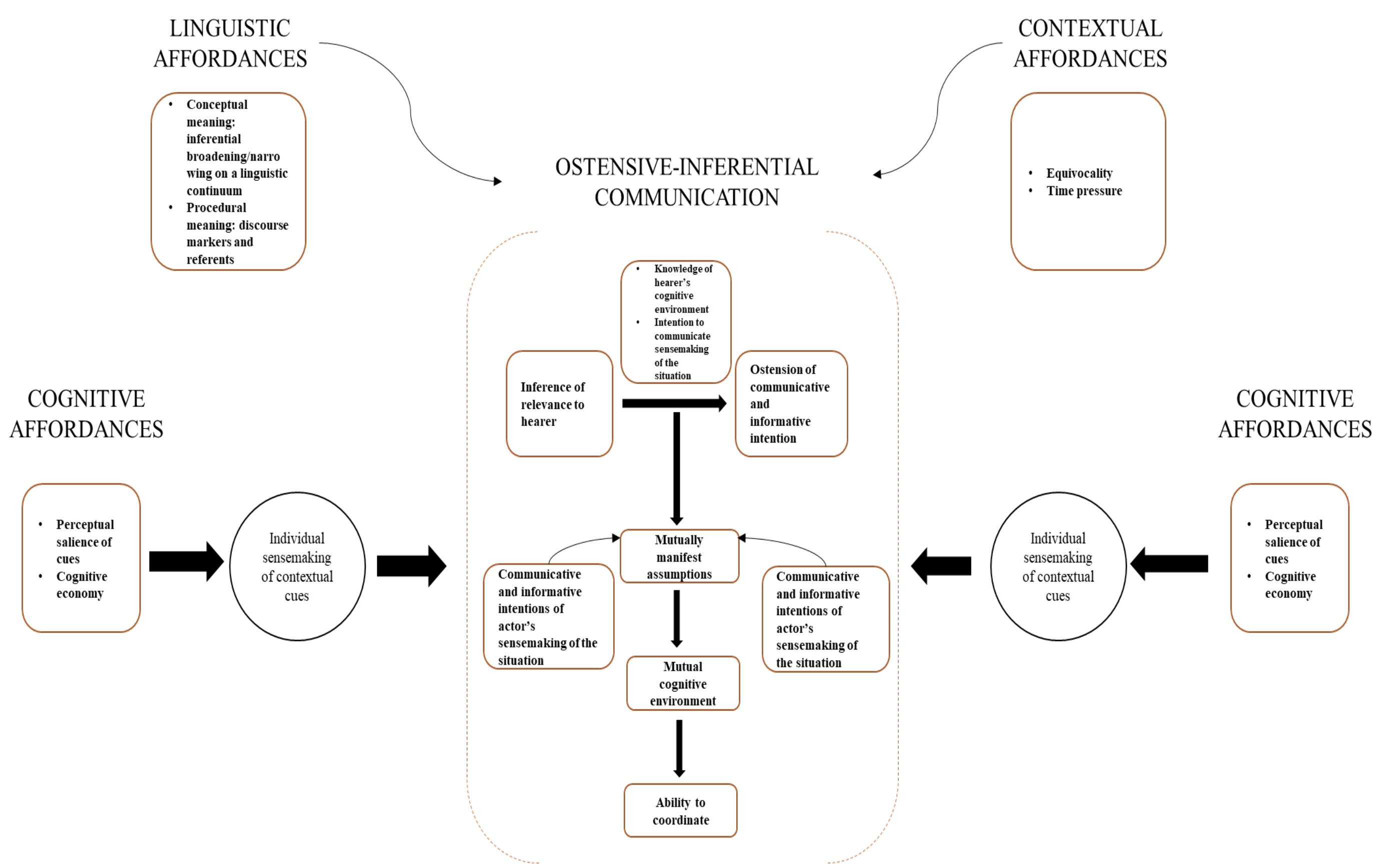
2.8. Appendix A

2.8.1. **Table 1**: The joint sensemaking outcomes of inferring a speaker's communicative versus informative intentions

Communicative intention	**Informative intention**	**Joint sensemaking outcome**	**Illustrative examples**
Manifest	Manifest	Mutual cognitive environment	KLM co-pilot: Wait a minute, we do not have an ATC clearance KLM pilot: No, I know that, go ahead ask (Weick, 1990)
Manifest	Not manifest	Repair request	KLM co-pilot: is he not clear then? KLM pilot: what do you say? KLM co-pilot: is he not clear then, that Pan American? (Weick, 1990)
			Commander Dick: if he gets off the bus, I want him stopped Ivor: do you want him lifted? James: do you want him detained? [question not responded to] (Cornelissen et al., 2014)
		Taken-for-grantedness	Mohan Varma (operator): Hey, can you smell it? I swear that's MIC Unnamed operator: There can't be any smell of MIC in a factory that's stopped. It's not MIC you smell, it's Flytox [mosquito spray]. (Weick, 1988)
			Commander Dick: can anyone gives us a percentage of identification? James: he is or he isn't (Cornelissen et al., 2014)
			Pat: [pushes James for an answer] James: for what it's worth, I think it's him Pat (to Dick): It is him, the man off [the] bus. They think it is him, and he is very, very jumpy (Cornelissen et al., 2014)
Not manifest	Manifest	Equivocality	Mr. Karrasch: It's okay, no problem Engineers: Did it mean there was no problem of getting solid, or no problem of uncovering the core, or what? (Perrow, 1975)
			Foam shedding as an 'in-family' event (Dunbar and Garud, 2009)
Not manifest	Not manifest	No mutual cognitive environment	Radio transmission screeches during the transmission ATC: Stand by for take off, I will call you Pan Am: And we're still taxiing down the runway, the clipper one seven three six (Weick, 1990)
			Ivor noticing JCM picking up a Metro newspaper (Cornelissen et al., 2014)

2.8.2. Figure 1: A conceptual framework of the communicative process by which actors move from individual sensemaking to coordinated action



Chapter 3: Pitching to win hearts: The role of communicated relational cues on entrepreneurial funding outcomes*

with Joep Cornelissen (RSM), Pursey Heugens (RSM), and Magdalena Cholakova (RSM)

*under embargo due to currently being revised for journal re-submission

Chapter 4: Entrepreneurial Pitching: A Critical Review and Research Agenda*

with Nelson Phillips (UCSB) and Joep Cornelissen (RSM)

*under embargo due to currently being in the review process at the *Academy of Management Annals*

Chapter 5: Concluding remarks

This doctoral dissertation was a five-year effort to build theory on processes of communication in different organizational settings. In this dissertation, I was fundamentally driven to better understand communication across organizational contexts, and I do so by combining different theoretical lenses and experimentally testing my hypotheses. I elaborate how communication is constituted, what kinds of linguistic affordances exist and how they intersect with communicators' cognitive architecture, and how these intersections inform and influence decision processes. I chose to study communication in contexts where there is significant uncertainty, in the form of ambiguity, equivocality, time pressure, information asymmetry, and unknowable uncertainty. Ultimately, this dissertation sheds light on how organizational actors strategically communicate under these conditions, and advances a relational orientation towards studying these processes of communication. The key takeaway of the dissertation is the following: communication is a continuous relational accomplishment.

While this takeaway might have a simplistic flavor to it, we see repeatedly how communication in organizational life becomes taken-for-granted as mere information transfer, and consequently loses its theoretical currency to describe, explain, and make sense of the way we think, relate, and organize. It is my hope that this dissertation offers a deeper insight into how language, nonverbal communication, and cognition work together to facilitate organizing, and that communication, in everyday discourse, loses the conduit metaphor for good.

SUMMARY

Communication is inescapable: it is what underpins how we (inter)act, make sense of the world, and organize ourselves. Ever since there was a field called management and organizations, communication has taken center stage in understanding, for instance, how leaders engage employees in strategic change initiatives, how two merging companies can build a cohesive culture, and more recently, how new venture founders can raise funds for a venture that does not yet exist.

Despite being so prevalent in management research, the dominant approach to communication in this literature is lacking in many respects. This approach, broadly speaking, considers communication as a set of signals that move from sender to receiver, get processed by the receiver, and are then sent back to the original sender, and so on. As such, this approach does not fully account for outcomes like misunderstandings and ambiguity, but it also falls short in considering the different motivations and backgrounds, both individual and shared, that the communicators have. Perhaps most importantly of all, I wanted to study communication in management contexts as an "interactional accomplishment" – moving away from dominant transmission approaches.

This was the gap where I started my research. The goal of this dissertation was to elaborate how actors, under different kinds of uncertainty, communicate to achieve certain objectives. In this dissertation, I take a relational approach to communication to examine how organizational actors mutually manifest meaning in a crisis situation (Chapter 2), how entrepreneurs fundraising for early-stage ventures convince investors of their relational potential (Chapter 3), and how scholars of entrepreneurial pitching can study pitching in a more interactive, contextualized, and sociolinguistically-embedded manner (Chapter 4).

In Chapter 2, I examine how actors jointly make sense of crisis situations, and what role language plays in these joint sensemaking efforts. I find that building mutual relevance is a critical pre-cursor for successful inference, but this is more difficult for ephemeral teams since team members have more limited knowledge of one another, thus making relevance in speech a more effortful task (made more difficult under conditions of uncertainty, like flying a plane in poor weather conditions). I also find that linguistic flexibility is extremely contingent upon mutual language, complicating how we currently think about extremely coded language (that we might find in flight desks, police forces, and other large, highly institutionalized organizations), or more figurative language (like metaphors and idioms). Too much reliance on one or the other creates more situational ambiguity, further complicating shared understanding and demanding more effort to make the right inference.

In Chapter 3, I explore a different communicative context with significant uncertainty: the entrepreneurial funding pitch, where entrepreneurs of very early-stage ventures try to raise funds from angel investors. I introduce a relational lens to studying how entrepreneurs communicate in a pitch, theorizing that the more relational communication they use, the more investors feel aligned and included in the pitch, and consequently, the more likely they are to want to mentor and financially invest in the entrepreneur's venture. Counterintuitively, I find that the more relational cues the entrepreneur uses in a pitch, the *less* coachable and *less* humble they appear – two inferences that are pivotal for investment decisions. Thus, relational alignment is important to investors, but it has to be in the direction of resource flows.

Finally, in Chapter 4 of this dissertation, I perform an integrative review of all the research on entrepreneurial pitching that has amassed thus far. I find that the majority of the literature considers pitching as an act of influence (from the perspective of the pitching entrepreneur), or as an act of optimizing decision processes (from the perspective of the evaluating investor). To build out a more communicative understanding of the pitch process, I present an integrative framework of the literature, drawing together studies that can bridge between the vantage points, contextualize the pitch temporally, spatially, materially, and across audiences, and sociolinguistically embed the pitch within a broader cultural landscape.

SAMENVATTING

Communicatie is onontkoombaar: het vormt de basis voor onze gedragingen en interacties, voor de manier waarop we de wereld begrijpen, en voor hoe we onszelf organiseren. Al sinds het ontstaan van het vakgebied Management en organisatie staat communicatie centraal in bijvoorbeeld de vraag hoe leidinggevenden werknemers betrekken bij strategische veranderingen, hoe twee fuserende bedrijven een gemeenschappelijke cultuur kunnen creëren, en meer recentelijk, hoe nieuwe ondernemingsoprichters fondsen kunnen werven voor een onderneming die nog niet bestaat.

Ondanks dat communicatie zo'n centrale rol inneemt in managementonderzoek, schiet de in de literatuur dominante benadering ervan op veel vlakken tekort. Deze benadering beschouwt communicatie grofweg als een reeks signalen die van de zender naar de ontvanger gaan, door de ontvanger worden verwerkt, waarna er signalen terug worden gezonden naar de oorspronkelijke zender, enzovoort. Deze benadering is niet alleen ontoereikend om uitkomsten zoals misverstanden en dubbelzinnigheid te verklaren, maar houdt ook geen rekening met de verschillende – individuele en gedeelde – motivaties en achtergronden van de communicatoren. Misschien wel het belangrijkste van alles: ik wilde onderzoek doen naar communicatie in managementcontext als "interactionele prestatie", en zo loskomen van de dominante transmissiebenaderingen.

Dit was de lacune vanuit waar mijn onderzoek startte. Het doel van dit proefschrift was om dieper in te gaan op hoe actoren communiceren onder verschillende vormen van onzekerheid om bepaalde doelstellingen te bereiken. Ik hanteer hierin de relationele benadering van communicatie om te onderzoeken hoe organisatie-actoren wederzijds betekenis scheppen in een crisissituatie (hoofdstuk 2), hoe ondernemers die fondsen werven voor startende ondernemingen investeerders overtuigen van hun relationele potentieel (hoofdstuk 3), en hoe onderzoekers van bedrijfspitching dit onderwerp kunnen bestuderen op een manier die meer interactief en contextueel is, en meer rekening houdt met sociolinguïstische aspecten (hoofdstuk 4).

In hoofdstuk 2 bekijk ik hoe actoren gezamenlijk betekenis geven aan crisissituaties, en wat de rol van taal is in dit proces. Mijn bevindingen laten zien dat het opbouwen van wederzijdse relevantie een cruciale voorloper is van succesvolle inferentie. Dit is echter veel moeilijker te bewerkstelligen voor tijdelijke teams omdat die een beperktere kennis van elkaar hebben, waardoor de totstandkoming van relevantie in spraak meer inspanning vereist – die nog moeilijker wordt onder onzekere omstandigheden, vergelijkbaar met het besturen van een vliegtuig onder moeilijke weersomstandigheden. Een andere bevinding is dat taalkundige flexibiliteit bijzonder zwaar rust op het bestaan van een gemeenschappelijke taal, wat de manier bemoeilijkt waarop we momenteel denken over extreem gecodeerd taalgebruik (zoals we dat bijvoorbeeld zien in de luchtvaart, bij de politiemacht, en in andere grote, sterk geïnstitutionaliseerde organisaties) of meer figuurlijk taalgebruik, zoals metaforen en idioom. Wanneer te zwaar op het een of het ander wordt geleund, leidt dit tot meer situationele dubbelzinnigheid, wat het bereiken van een gedeeld begrip verder bemoeilijkt en wat ervoor zorgt dat het nog meer inspanning vraagt om tot de juiste inferentie te komen.

In hoofdstuk 3 onderzoek ik een andere bijzonder onzekere communicatie-context: die van de ondernemingspitch voor fondsenwerving, waarmee oprichters van ondernemingen in een vroege opstartfase fondsen trachten te werven van business angels. Ik bekijk de manier waarop ondernemers tijdens een pitch communiceren door een relationele lens, uitgaande van de theorie dat hoe meer relationele communicatie ze benutten, hoe meer de investeerders het gevoel hebben dat ze bij de pitch betrokken zijn en ermee op een lijn zitten, en hoe meer bereidheid ze vervolgens tonen om de ondernemers te begeleiden en financieel te ondersteunen. Mijn contra-intuïtieve bevindingen wijzen er echter op dat hoe meer relationele signalen ondernemers gebruiken in een pitch, hoe *minder* coachbaar en bescheiden ze overkomen – twee gevolgtrekkingen die cruciaal zijn bij de beslissing om te investeren. Relationele afstemming is wel degelijk belangrijk voor investeerders, maar het moet in de richting van de middelenstromen gaan.

Tot slot voer ik in hoofdstuk 4 van dit proefschrift een integratieve review uit van al het onderzoek naar ondernemingspitching dat tot op heden is verschenen. Mijn bevinding is dat pitching in het grootste deel van de literatuur wordt beschouwd als een beïnvloedingshandeling (vanuit het perspectief van de pitchende ondernemer), of als een handeling gericht op de optimalisering van besluitvormingsprocessen (vanuit het perspectief van de evaluerende investeerder). Om een beter begrip van de communicatie in het pitchproces op te bouwen, presenteer ik een integratief literair kader, waarbij ik studies samenbreng die bruggen kunnen slaan tussen de standpunten, die de pitch contextualiseren voor verschillende doelgroepen in temporele, ruimtelijke en materiële zin, en die kunnen bijdragen aan de sociolinguïstische integratie van de pitch in een breder cultureel landschap.

ABOUT THE AUTHOR

Sai Gayathri Kalvapalle was born in Hyderabad, India. A global citizen, she was raised in Mumbai, India, Kuala Lumpur, Malaysia, and Atlanta, USA. She completed her undergraduate studies with honours in Psychology at the University of Waterloo in Ontario, Canada, where she also completed a Minor in English Literature. She then moved to London, UK, to complete a Master of Science (MSc) in Organisational and Social Psychology at the London School of Economics and Political Science, where she graduated with Distinction. In 2017, she started her doctorate degree at the Rotterdam School of Management, Erasmus University, in the Department of Business-Society Management. During her PhD studies, she was also a visiting research scholar at the Technology Management Department at the University of California Santa Barbara.

Sai's research is theoretically motivated by how communication is elaborated in management and entrepreneurship research, to explain how people organize, persuade, and make decisions. Specifically, she advances an agenda for a relational orientation to communication that is interactive, inferential, and institutionally embedded. In addition to this core focus, she investigates how technology informs and influences processes of institutional maintenance and change. She employs conceptual, experimental, and review-based methodologies to address her research questions.

PORTFOLIO

PUBLICATIONS AND MANUSCRIPTS UNDER REVIEW

Kalvapalle, S.G., Phillips, N., & Cornelissen, J. Entrepreneurial Pitching: A Critical Review and Research Agenda. Under review at *Academy of Management Annals*.

Barton, K. R., Yazdani, Y., Ayer, N., **Kalvapalle, S**., Brown, S., Stapleton, J., & Harrigan, K. A. (2017). The effect of losses disguised as wins and near misses in electronic gaming machines: A systematic review. *Journal of Gambling Studies*, 33(4), 1241-1260.

WORKING PAPERS

Kennedy, M., Phillips, N., & **Kalvapalle, S.G.** Beyond the Turing Test. *Writing*. Target journal: *Organization Theory.*

Kalvapalle, S.G., Cornelissen, J., Heugens, P., & Cholakova, M. Pitching to win hearts: The role of relational cues in investment pitching. *Writing*. Target journal: *Journal of Business Venturing.*

Kalvapalle, **S.G**., Cornelissen, J., & Heugens, P. Mutually manifesting meaning: A relevance theory perspective on sensemaking in context. *Writing*. Target journal: *Organization Studies*

Kalvapalle, S.G., & Reader, T.W. Peering through the glass door: Unobtrusively analyzing negative employee feedback to aid organizational learning. *Data analysis*. Target journal: *Social Science and Medicine.*

Kalvapalle, S.G. Institutional maintenance and change in mobile dating technologies. *Preparing for data collection*. Target journal: *Administrative Science Quarterly.*

PRACTITIONER ARTICLES

Kalvapalle, S.G. (2018). What can high risk organisations learn from complaints? *Rotterdam School of Management Centre of Excellence in Public Safety Management (CESAM) blog*.

Kalvapalle, S.G. (2017). Apps like Tinder commodify the intangible. *LSE Business Review*.

CONFERENCE PRESENTATIONS

S Kalvapalle, J Cornelissen, M Cholakova. Pitching to Win Hearts: The Effects of Relational Communication in Entrepreneurial Funding Pitches. Academy of Management 2022, Seattle USA.

S Kalvapalle, J Cornelissen, P Heugens, M Cholakova. Pitching to Win Hearts: The Effects of Communicated Relational Cues in Entrepreneurial Funding Pitches. Positive Organizational Scholarship Research Conference 2022, Ann Arbor, USA. (accepted but could not attend).

S Kalvapalle, T Reader. Peering through the glass door: Unobtrusively accessing employee voice to inform organizational learning in the National Health Service (NHS). European Group for Organization Studies 2022, Vienna, Austria. (presented by co-author)

S Kalvapalle, J Cornelissen, M Cholakova. Pitching to Win Hearts: The Role of Communicated Relational Cues in Entrepreneurial Funding Pitches. Babson College Entrepreneurship Research Conference 2022, Waco, USA. *Denoted top 40 paper.*

S Kalvapalle, J Cornelissen, M Cholakova. Identifying the Functional Relationships Between Verbal and Nonverbal Communication in Entrepreneurial Funding Pitches. Strategic Management Society 2021, virtual due to COVID-19.

S Kalvapalle, J Cornelissen. Pitching to win hearts: the role of relational cues in investment pitching. European Group for Organization Studies 2020, virtual due to COVID-19.

S Kalvapalle, J Cornelissen, P Heugens. Communicating sense: the role of inference in joint sensemaking in equivocal contexts. Academy of Management 2020, virtual due to COVID-19.

S Kalvapalle, J Cornelissen. Sensemaking as inference-making: A relevance theory perspective on discourse as the basis for organized action. European Group for Organization Studies 2019, Edinburgh, Scotland.

SERVICES

PhD Representative and Executive Committee Member, ENT Division, 2022-2023

Responsible for creating initiatives to improve the PhD student experience in the ENT community, bi-monthly contributor to the studENT blog.

Social media representative, *Journal of Business Venturing*, Aug 2022

I ran *JBV*'s Twitter, Instagram, and LinkedIn pages to showcase ENT division activities at the AOM conference

Panel member, Nov 2020

Cultivating Flourishing in a Remote Environment (Honorary Doctorate for Professor Jane Dutton)

Reviewer, 2019 – 2022

Annual reviewer for Academy of Management (AoM) conference, OMT, MOC, ENT divisions

CONFERENCE ORGANIZER

Business and Society PhD Conference, RSM **2019**

1-day conference between Rotterdam School of Management, Amsterdam Business School, and Vrije Universiteit (VU) Amsterdam

Annual Dissertation Conference, LSE **2017 – 2022**

1-day conference for MSc students at the LSE to present dissertation research to practitioners, faculty, and peers

EXTRACURRICULAR EXPERIENCE

Participant, UCSB Technology Management TORS **Spring 2023**

Participant, Department of Business-Society Management Write Club, RSM **2019 - 2022**

Vice-Chair of Erasmus Research Institute of Management (ERIM) PhD Council **2018 - 2019**

Department Representative, London School of Economics **2016 - 2017**

MSc Class Representative, London School of Economics **2016 - 2017**

President, University of Waterloo English Society **2014 - 2015**

TEACHING EXPERIENCE AND TRAINING

Seminar leader, Global Business Strategies, MSc Global Business and Sustainability **2022**

- Delivered lectures on organizational strategies to meet Sustainable Development Goals
- Liaised with company representatives from multinational companies to facilitate student team projects and presentations

Course coordinator, Company-Based Research Project, MSc GBS **2022**

- Directly supervised MSc students conducting research projects at organizations

Seminar leader, Qualitative Research Methods, MSc GBS **2019, 2021**

- Responsible for delivering workshops on interviewing, coding, and foundations of qualitative research
- Facilitated student engagement by running in-class assignments and discussing student work

Seminar leader, Sustainability Leadership & Planetary Boundaries, MSc GBS **2020**

- Delivered lectures on principles of sustainability leadership and circular economies
- Facilitated student brainstorming in teams and actively encouraged student participation

Seminar leader, Sustainability, Leadership, & Governance, BSc in International Business Administration **2019**

- Delivered interactive lectures on sustainability, moral decision-making, and stakeholder management
- Discussed relevant real-world cases with students, and facilitated debates and interactive exercises

Bachelor Project (Global Thinkers) supervisor **2022**

- Supervised six teams on the topic of investment biases when raising capital globally

MSc Thesis supervisor **2018 - 2022**

I have supervised more than 20 thesis projects, coaching MSc students in designing, carrying out, and writing up a research paper on a sustainability topic of their choice. A few examples are included below.

- Message framing on climate change deniers: Experimental research on whether a systems-justification frame (i.e. economic benefits to climate activism) and a lifestyle frame (i.e. lifestyle maintenance benefits to climate activism) on attitudes to climate activism

- The role of moral purity on sustainable investing: Experimentally priming participants to feel disgust, and measuring whether disgust motivates participants to compensate by making sustainable investments
- Employee-led coupling process in Big Pharma: Qualitatively analyzing how employees deal with the dissonance between talk and action created by organizational leaders in a stigmatized organization

Certifications:

Didactic Skills Training, Risbo (Research and Teaching Consultancy, Rotterdam) **Mar 2019**

Scientist Knowledge Translation Training (SickKids, Toronto) **Feb 2016**

RESEARCH COURSES AND TRAINING

Theory Courses

Discourse and Institutions, Nelson Phillips, UCSB (audit) **2023**

Topics in the Philosophy of Science, Conrad Heilmann, Erasmus U. **2017**

Developing Theory and Theoretical Contributions, Joep Cornelissen, Erasmus U. **2018**

Advanced Topics in Org. Theory, Pursey Heugens and Samer Abdelnour, Erasmus U. **2018**

Workshops & Summer Schools

Medici Summer School **2021**

Conducting Experiments in Entrepreneurship Research **2021**

Microfoundations of Institutions, HEC Lausanne **2017**

Strategy, Organization, and Society, Ardeche (hosted by EM Lyon) **2018**

Business and Society Workshop, University of Amsterdam **2018**

Methods Courses & Training

Qualitative Methods, Pursey Heugens, RSM **2017**

Experimental Methods in Business Research, Maarten Wubben, RSM **2018**

Advanced Qualitative Methods, Mirjam Werner, RSM **2018**

Fuzzy Set Qualitative Comparative Analysis, Charles Ragin & Peer Fiss, UC Irvine **2019**

Mediation, Moderation, and Conditional Process Modeling, Ioannis Evangelidis, RSM **2020**

Video-Based Research Methods, Curtis LeBaron, CARMA **2020**

Software expertise

SPSS, NVivo, Qualtrics

LANGUAGES

Native: English, Telugu, Hindi

Intermediate: Spanish

Beginner: Dutch, Portuguese

THE ERIM PHD SERIES

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Dissertations in the last four years

Abdelwahed, A., *Optimizing Sustainable Transit Bus Networks in Smart Cities*, Supervisors: Prof. W. Ketter, Dr P. van den Berg & Dr T. Brandt, EPS-2022-549-LIS

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