Book Reviews

Jonathan Ginzburg, **The Interactive Stance: Meaning in Conversation**, Oxford Linguistics, Oxford University Press, 2012, pp. 432. ISBN: 978019969792-2 (hardback) GBP 79, ISBN: 978019872299-1 (paperback, 2015) GBP 27.99, (e-book).

In a decade in which commercial applications such as the automated conversational assistant SIRI saw the light, the need for well-grounded and empirically motivated theories of meaning in conversation are more than in need. These are news for technology, but they are not for science; being such vitals aspects of human nature, *meaning and conversation* have been much investigated. The gigantic literature in the topic comes from different areas. Semanticists, logicians and philosophers, socio-linguists, psycho-linguists and conversational analysts, and more recently computational linguists, have contributed countless theoretical insights and empirical findings. Approaches and methodologies vary greatly depending on the area.

First, *semanticists, logicians and philosophers* have contributed myriad theoretical insights such as the mechanisms behind the inference of conversational implicatures [8], as well as formal theories for constructing the logical forms of contributions in a discourse, such as Segmented Discourse Representation Theory [1]. The researchers in this area have traditionally studied *successful communication* abstracting away from the repair mechanisms involved in conversation. Since the repair mechanisms constitute an important fraction of talk in interaction, the dominant paradigms in this area have abstracted away, not only from repair, but also from naturally occurring conversation, focusing instead on written discourse or selected isolated assertions.

Second, *socio-linguists, psycho-linguists and conversational analysts* have contributed a huge amount of empirical findings. In contrast to semantics, logic and philosophy, in sociolinguistics and discourse analysis, natural conversation has been thoroughly investigated. As a result, repair has been an important theme for almost three decades now; see [17] as a representative example. Moreover, the study of the social factors such as those studied by politeness theory [2] has shown to have a deep impact on language evolution. Finally, the study of cognitive issues have allowed to explain what kinds of conversational contexts people can represent and reason about [9].

Third, due to its frequency in conversation, practical interest in repair and other frequent phenomena in conversation doesn't need to be awakened in *computational linguists*, as made evident by the amount of relevant work in the area [6; 14; 16; 15; 18]. This community has particularly contributed to the study of mechanisms that are commonplace to dialogue and not found in written discourse. To begin with, it has advanced the study of grounding strategies in dialogue and other metacommunicative interactions that ensure that communication is robust [19]. Moreover, it has recognized the existence and the need to characterize non sentential utterances (NSU) [4]. And it has also extended the study of conversation to multi-party dialogue which poses its unique challenges [5].

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However, the theoretical scope of these frequent phenomena and its implications for a theory of meaning are still being delineated. Ginzburg's book *The interactive stance: Meaning in Conversation* proposes to redefine natural language meaning based on conversation, putting in the leading role the conversational context but also the mechanisms that allow conversation to be a robust process that can recover from mistakes. As a result, context and repairs (a.k.a clarification requests) are a basic component in a theory of meaning:

> "The adequacy of a semantic theory involves the ability to characterize for any utterance type the **contextual update** that emerges in the aftermath of successful exchange and the range of **possible clarification requests** otherwise — this is, arguably, the early twenty-first-century analogue of truth conditions." [7, p.8]

In this view, repairs are not a necessary evil but an intrinsic mechanism of language. In fact, interpreting an utterance centrally involves characterizing the space of possible requests of clarification of the utterance, that is, its *clarification potential*. Ginzburg's book is written from a formal perspective and provides a theory for constructing the logical forms of the contributions in a conversation. Such theory is precise enough in order to be computable but it is based on empirical findings obtained by computational linguistics and language acquisition techniques. In this way it combines insights from the three previously presented different traditions that have studied meaning and conversation. It constructs a full formal theory of meaning in conversation during its 9 chapters, step by step.

Chapter 1 starts by discussing the reasons why it pays off to study meaning in conversation taking into account two crucial components of the communicative process: the conversational context and the frequently occurring mechanisms of conversation management such as repairs and non-sentential utterances. Ginzburg proposes to use conversation as a way to bridge the mechanisms and results of the different disciplines that study meaning and, with this plan in mind, proceeds to the following chapters.

Chapter 2 spells out the differences of abstracting away from conversation and its mechanisms when studying meaning. A simple observation does a big job in this chapter, illustrating how different written discourse and conversation can be: normally, the most common word in written discourse is *the* while the most frequent word in the naturally occurring conversation in the British National Corpus [3] is *yes*. This simple difference makes evident that conversation cannot be modeled without taking into account the conversational context but also points out that the contexts available to different conversation participants in the aftermath of an utterance are *not identical* (as frequently assumed by semanticists). If contexts were identical there would be no need for positive acknowledgments such as *yes* to signal successful communication. In the case of misscommunication, Ginzburg points out in this chapter that, contrary to what is commonly believed by sociolinguists, the *clarification potential* of an utterance is highly structured, not everything in an utterance can be a source of trouble. Both observations, the asymmetries in speaker

and addressee context and the structure of the clarification potential pave the way to much of what is developed in the chapters to follow.

Chapter 3 starts to define how the conversational context (a.k.a, the information state [10]) should be represented so that the clarification potential of an utterance can be predicted. The formalism proposed by Ginzburg to this end is Type Theory with Records (TTR). TTR is a model theoretic extension of Constructive Type Theory [12]. TTR is described in detail in this chapter and used to construct an ontology that combines a situation theoretic representation of propositions and a fine-grained representation of utterance types in order to represent context. Chapters 4, 5 and 6 use this representation in a way so that the structured clarification potential of sentential and non sentential utterances can be modeled.

Chapter 4 defines the possible dialogue moves (a.k.a conversational update rules) performed by different utterance types and formalizes how they affect the public and the private information represented in the conversational context using the ontology developed in the previous chapter. This chapter makes evident the fact that a dialogue move may update the conversational context of each dialogue participant in different ways. As a result, the private context representation available to different conversation participants and also their representation of the public contexts may not be identical at each point during a conversation. The context representation contains three main components: the accepted information (FACTS), the moves that have taken place (MOVES) and the questions that have been raised and are still under discussion (QUD). Using these components, a formal definition of queries and assertions and their potential adjacency pairs is provided. This chapter assumes that utterances are complete sentences, the next chapter drops this simplifying assumption.

Chapter 5 outlines the grammatical formalism proposed by the book that allows for the representation of the internal structure of utterances as well as for dealing with non-sentential utterances. The grammatical formalism described is HPSG_{TTR}, a variant of Head-Driven Phrase Structure Grammar (HPSG) [13] which uses TTR records, records types and λ-calculus for semantic composition. A small English grammar is developed using this formalism covering declarative clauses, yes-no-questions and wh-questions. The chapter postulates the *Reprise Content Hypothesis* (RCH) which proposes that the contextually dependent semantic content of an utterance is defined by the content that can be queried in a clarification request. If so, examining what a clarification request actually asks about (and how it is answered) identifies that content. The RCH is postulated as a more specific way of defining compositionality since it identifies the contextually dependent content. In this way, the contextualized meaning of an utterance is strongly linked to its clarification potential.

Chapter 6 investigates the range of clarification requests that are part of the clarification potential of different kinds of utterances. It then combines the elements presented in the previous chapters to develop a protocol in which a dialogue move results in an update in the conversational context if all contextual parameters can be grounded or, otherwise, it gives rise to a clarification request. A corpus-based characterization and classification of the range of clarification requests that occur

in three different corpora is presented. Clarification requests are classified according both to form and content and a bottom up taxonomy with good coverage is developed. Such taxonomy allows not only to characterize the range of clarification requests but also the contextually dependent content of the utterances since, what is usually clarified gives good evidence of what is grounded for similar utterances if no issue arises. Ginzburg then claims that the modeling of the clarification potential of an utterance is tractable since the sources of clarifications are highly constrained.

Chapter 7 presents a corpus-based classification of the different types of non sentential utterances that occur in the British National Corpus. Then a grammar for the different kinds of non sentential utterances is developed. Given the ground covered in Chapters 3, 4 and 5, the resulting grammar is a straightforward development and the complexity of the resulting NSU types seems to correlate with the order of aqcuisition of these NSU constructions by infants, as discussed in Chapter 8.

Chapter 8 explores extensions to the developed theory in several directions. First, it considers how to scale it up from two-party to multi-party interaction. Second, it proposes to unify self-repair mechanisms with the proposed clarification request modeling mechanisms. Third, it discusses how the theory should be extended in order to account for intention recognition in dialogue. Fourth, it discusses evidence about the order of acquisition of non sentential utterances by infants as a way of showing the comparative complexity of different NSUs types. Finally, the grammar is extended in order to handle quantified noun phrases and anaphora while preserving the RCH.

Chapter 9 is a survey of the most important contributions of the book. As we have seen, a lot of ground is covered by this book. In particular, it shows that the combination of insights from empirical analysis of corpora, formal semantics and language acquisition can be rewarding. It does so by putting in the leading role crucial components of the study of meaning in conversation that have not been the favored themes of research of most related areas: the conversational context and the frequently occurring mechanisms of conversation management such as repairs and non sentential utterances. Although, this book is more restricted with respect to the grammatical phenomena that it can handle than other formal theories, it complements comprehensive formal theories of the workings of conversation such as [1] with empirical insights obtained from the analysis of corpora.

This book does an important job, as it performs a step towards bridging the gap between techniques from diverse areas such as semantics, conversational analysis and computational linguistics, as seen from a formal perspective. The book assumes a strong formal background; grasping the details of the formalizations otherwise is not an easy task. As a result, it is a good entry point to the other areas for semanticists, logicians and formal linguists interested in meaning in conversation; people from other areas should grasp the main arguments but may not be able to follow and verify the details by themselves.

One important direction in which the area of meaning in conversation is advancing into is the use of machine learning techniques in order to model the probabilistic aspects of conversation and context. Bridging theories of formal semantics such as the one developed in this book and such techniques is one of the most important

challenges that the future brings for meaning in conversation (see [11] for a step in this direction). This is a big challenge that will need to be addressed soon in order to provide solid ground for current technological advances.

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Luciana Benotti
Logic, Interaction and Intelligent Systems Team
Facultad de Astronomía, Matemática y Física,
Universidad Nacional de Córdoba, Medina Allende s/n
Córdoba, Argentina
luciana.benotti@gmail.com