Introduction

> *There is a paradox here – a delicious one – which I cannot resolve: if there is indeed a fundamental difference between experience and description, between direct and mediated knowledge of the world, how is it that language can be so powerful? Language, that most human invention, can enable what, in principle, should not be possible. It can allow all of us, even the congenitally blind, to see with another person's eyes.*
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> *Oliver Sacks, The Mind's Eye (2010:240)*

Imagine you are trying to find your friend who is waiting for you in the cafeteria of a large hospital. The building is complex, and you don't see any signs that would help you find the way. You ask the receptionist, who advises, 'Well, try the big staircase over there, it must be there somewhere!' What do you make of this? Almost certainly, you'd be well aware (and probably very surprised) that the receptionist doesn't really know where the cafeteria is. Nevertheless, you might try the staircase as advised.

But – how do you know this? Where does your awareness of the receptionist's lack of knowledge come from? Can you read her mind? She never mentioned any uncertainty explicitly, and you probably wouldn't be able to state her ignorance as a given fact. Nevertheless, your knowledge of language, and of the principles of conventional language use, enable you to make this inference. The receptionist's uncertainty was communicated implicitly, not explicitly – not in *what* was said, in terms of the information conveyed, but in *how* it was said, in terms of linguistic features.

With a closer look, you will find evidence in the receptionist's short answer to support your intuition. To start with, you may note what was *not* said: she didn't, as might be expected, give you precise directions to the cafeteria. Instead, there are various indications of vagueness and uncertainty. The initial discourse marker *well* provides a first hint, followed by the term *try*, which points to an activity that should not be necessary while following an expertly given route description. Referring to the main staircase as 'the big staircase over there' seems odd, and the modal verb *must* indicates a degree of uncertainty. Finally, the term *somewhere* isn't sufficiently specific to serve as expert guidance. Quite likely, the receptionist's utterance also *sounded* hesitant with

regard to prosody and fluency, which you would recognise as additional subtle indicators.

Any adult native speaker of a language will intuitively recognise features such as these. In everyday life, we absorb this kind of implicit information subtly, swiftly, and effortlessly. This book demonstrates how to use these insights and intuitions systematically for research on human cognition, based on a wealth of findings on the relationship between language and thought. Cognitive Discourse Analysis – CODA – is a method designed to reveal how speakers' thoughts and concepts are reflected in language, both explicitly and implicitly. CODA looks at linguistic data, at spoken or written language (i.e. discourse) produced in situations relevant to thinking. Closely related to traditional discourse analysis methods, CODA means doing discourse analysis with a focus on concepts and thought processes.

In a very basic sense, speaking is based on thinking. Without concepts and thoughts there would be no language. Sounds and noises may be produced without cognition, but meaning cannot. Also, language seems to be the most direct medium available to humans for expressing our thoughts; almost inevitably, we will answer the everyday question 'What are you thinking?' through language rather than any other medium.

Linguistic research, across various subfields, is accumulating an ever-increasing wealth of insights about the ways in which language relates to cognition. In cognitive linguistics, various theories address the relationship between language and the mind (e.g. Evans, 2009a, 2009b; Langacker, 2000; Talmy, 2000, 2007; Tomasello, 2003). In particular, lexicogrammatical structures in language appear to be systematically related to cognitive structures and processes. This structural fact carries over to principles of language in use: the way we think is related to the way we talk. This is true both generally in terms of what we can do with language (or with a particular language in contrast to another), and specifically with respect to what we actually do.

The relationship between language and thought may not be simple, but it is nevertheless systematic. For instance, how a speaker describes a scene reflects what they are currently attending to in the scene, in contrast to other aspects of the scene that are not mentioned or remain in the background. Thus, *the car next to the tree* conveys a different focus of attention to *the tree next to the car*, even though the spatial relationship is identical. In both cases, other objects in the scene, and aspects such as the car's colour or the type of tree, are not represented at all.

Linguistic choices reflect crucial aspects of the speakers' concepts and strategies at the time of speaking, along with their relevance in a communicative context. Some of these strategies may be intentional, but most of our linguistic choices while speaking happen too quickly to be completely conscious. Because of these phenomena, discourse analysis provides a good pathway to access

various layers of cognition, assuming the necessary expertise regarding relevant features of language. This book offers the conceptual tools needed for this. It will enable researchers to reveal aspects of human thought through a close analysis of language.

CODA primarily uses language as data that more or less directly expresses thoughts and concepts: for example, when people describe a complex scene or event, think aloud while solving a problem or making a difficult decision, or explain a complicated process to a friend. All of these situations involve cognitive challenges that will find their way into language in systematic ways, depending on the specific features of the situation.

Some aspects concerning human thoughts are directly reflected in content, and researchers have used this fact for many decades in cognitive science (Ericsson & Simon, 1993). For instance, when asked to think aloud, people will say what they are thinking about and consider their task-related observations explicitly. Verbal protocols can therefore reveal the cognitive steps that humans take to solve a complex problem. However, language reflects more than this, beyond the content that speakers express directly. For instance, in an utterance like 'Have you still not finished reading?', the marker *still* subtly conveys the speaker's underlying expectations. Likewise, in 'I have heard about it, too,' the term *too* reflects the speaker's knowledge about not being the only one to which the utterance applies.

Other aspects that have been established through linguistic research may be less obvious to a non-expert. For instance, the prepositions *in* and *on* convey more than the geometric properties that they denote: they also suggest a sense of control, as illustrated by 'the painting is on the wall', or 'the flowers are in the vase'. Although the flowers are not fully contained in the vase, the term *in* can be used because the vase controls the flowers' location; the flowers will move with the vase when carried to another place in the room.

Subtle markers such as these are well known in linguistics, and they represent a vast resource of insights about human thought. CODA offers a comprehensive way of applying these insights through systematic analysis of human language use. The goal is to illuminate underlying concepts and thought processes that may go beyond conscious reflection by individual speakers, and that may not necessarily be directly observable in linguistic content. This is because speakers are typically not aware of the underlying network of options that allows for a range of linguistic choices besides their own. This network only becomes evident by considering a larger data set collected under controlled circumstances. To identify the conceptual significance of these choices, CODA draws on rigorous data collection procedures and involves systematic analysis measures. Equipped with the necessary tools, as described in this book, the researcher can reveal systematic aspects of human thought by a close look at language use in relation to the context of production.

The book is structured as follows. The first three chapters provide general background and discuss the approach from an interdisciplinary perspective.

- Chapter 1 sets the stage by outlining the background and scope for CODA: what does the method build on, what is it intended for, why and where is it useful, and what are the limits of this approach to cognition?
- Chapter 2 discusses the relationship between language and thought from a variety of perspectives. This further elaborates on the background for CODA by relating the methodology to approaches in psycholinguistics and cognitive psychology.
- Chapter 3 turns to insights that support the analysis from three different fields: cognitive linguistics, discourse analysis, and functional grammar. Each of them offers a host of resources for analysts to draw on: practical insights as well as theoretical findings to relate to in order to make sense of linguistic patterns found in the data. This concludes the set of general background chapters.

Chapters 4–7 address specific cognitive aspects that have frequently been addressed using CODA, and that illustrate the kinds of phenomena that CODA can identify. The eight aspects discussed in these chapters can be regarded as possible analysis perspectives that complement each other, and that serve as examples of ways to analyse language in relation to cognition. Linguistic data will normally not be analysed with respect to all of these aspects at once, nor only from a single one. Instead, awareness of the wide range of possible analysis perspectives will allow the analyst to identify particularly interesting phenomena in their data that are relevant to their research question.

- Chapter 4 discusses two central aspects of cognitive orientation, namely *attention* and *perspective*. Whenever we describe something, what we say will reflect what we attend to; aspects that we barely think about will rarely be reflected in our descriptions. Also, while we often describe things from our own point of view, other perspectives are possible, such as our interaction partner's standpoint. While we don't often say explicitly which perspective we're using, our language will reflect the underlying viewpoint in systematic ways.
- Chapter 5 turns to cognitive depth, another aspect of our thinking that is regularly reflected in the way we formulate our thoughts. On the one hand, we can think things through, and formulate them in language, in much detail or we can remain on the surface, sticking to the mere essentials. On the other hand, we can be more or less certain about what we describe, reflecting our expertise or the uncertainty of the subject matter itself. Both aspects, *granularity* and *certainty*, work together, as experts will often be able to look into things in much more depth than novices – but on the other hand they don't always need to, as they quickly recognise patterns that they have come across before.

- Chapter 6 addresses two ways in which our minds can be constructive: either by making inferences on the basis of what's already there – filling in gaps of information – or by transforming what's there into something new. This twofold ability of the human mind to construct is basic to our existence, enabling us to go beyond what we encounter around us. The way we talk reflects both *inference* and *transformation* processes systematically.
- Chapter 7 turns to a set of aspects around the formulation of thought. On the one hand, whenever we put our thoughts into words, we do this for a specific purpose – typically for the benefit of an interaction partner. The first half of Chapter 7 discusses *communication* and dialogic interaction. The second half addresses the idea of *cognitive strategies*, which are the main target of think-aloud protocol analysis in traditional problem-solving studies. These are not intended to be primarily formulated for an addressee but instead represent the structure of cognitive processes in temporal sequence.

This concludes the set of chapters addressing analysis perspectives. The remaining two chapters offer more practical insights.

- Chapter 8 provides a detailed account of practical steps and advice for doing CODA. Starting with preliminary considerations as to the purpose of individual CODA studies, it discusses relevant procedures step by step, including experimental design aspects, data collection, data preparation, practical steps of data analysis, and considerations pertaining to qualitative and quantitative analysis methods.
- Chapter 9 looks beyond CODA in two ways. On the one hand, CODA is only one among many established ways to examine human thought; linguistic analysis can be easily and fruitfully combined with other methods. On the other hand, CODA is rarely used purely for its own sake; more often than not, linguistic analysis is part of a wider goal. Therefore, the second half of Chapter 9 concludes the book with a discussion of practical uses for the methodology in academia and beyond, in applied fields such as architecture and artificial intelligence.

With this overall scope, I am confident this book will be of interest to readers from various academic fields, and indeed readers beyond academia in areas where insights about human ways of thinking would be welcome. While this book was primarily written for researchers in their early career stages onwards, there is no prerequisite for doing CODA. Anybody who speaks a language well enough to have clear intuitions about the network of options available in that language can do a CODA study. The only prerequisite is a readiness to do systematic analysis, as this will allow for significant insights based on speakers' choices in situations where thoughts are relevant.

So the book is open to all – but different readers come with different backgrounds and might be interested in different aspects of the book. My own background is a combination of linguistics and cognitive science, and it is quite

possible that this has some reflection in my writing. Perhaps those with a similar background will be the ones most interested in reading the book cover to cover. Many readers will already be familiar with CODA from their own research, or from having read the shorter introductory article in Tenbrink (2015); they might wish to access further information about specific aspects of CODA in the book.

Other readers might be more selective. Academics with a firm background in linguistics, especially those aspects covered in the book, may quickly skim through the earlier chapters or jump directly to the various analysis perspectives starting in Chapter 4. In contrast, cognitive scientists with little background in linguistics might find the first three chapters particularly enlightening, together with the procedural Chapter 8 and the final Chapter 9 on extensions. They may also develop their own ideas for analysis perspectives rather than relying solely on those outlined in Chapters 4–7.

Some researchers interested in language and cognition from a more theoretical perspective might get inspiration from the first three chapters alone. Conversely, some may focus entirely on practical aspects, perhaps in order to gain insights into doing systematic discourse analysis as part of a larger project; they may find Chapters 8 and 9 to be entirely sufficient. Finally, it is possible to use the book as a handbook rather than a textbook to read, and simply access it sporadically to find specific information on some aspect of language in relation to the mind. The Register of Linguistic Features and the Index provided at the end of this book should be helpful for this kind of use.

Whichever way you use this book, I hope you find it inspiring and helpful for your own purposes. It is my firm belief that language is an excellent medium that represents our thoughts systematically in accessible and analysable ways – and I cannot imagine anything more fascinating than the human mind, with all its complexities and diversities.