

Linguistics. Despite its focus on English and Scots, researchers working on the historical dialectology of other languages will benefit greatly from reading this volume.

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Wallace Chafe, *Thought-based linguistics: How languages turn thoughts into sounds*. Cambridge: Cambridge University Press, 2018. Pp. ix + 199.

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From the Sapir-Whorfian hypothesis to the neo-Whorfian hypothesis of ‘thinking for speaking’ (Slobin 1996: 76), the relationship between language and thought

has been a heated topic in linguistics.¹ Wallace Chafe's new book regards thought as a fundamental part of language design and notes that 'language begins with thoughts in the mind of a speaker and ends by affecting thoughts in the mind of a listener' (1). In this work, the author probes linguistics from a thought-based perspective in contrast to an approach based on sound or writing.

This monograph is an important contribution to the growing body of research on the language–thought interface, gaining support from a wide range of fields such as linguistics, psychology, translation studies, and literature. By combining theoretical analysis with diverse evidence from language and cognition, Chafe ingeniously bridges thought-based linguistics with a large body of research relevant to language, thought, mind, consciousness, and brain. As Chafe passed away in 2019, this book undoubtedly reflects the most remarkable achievements of his life's work and will be his great legacy.

The book consists of 21 chapters, which are divided into six parts. Part I introduces the basic assumptions, Part II illustrates different properties of thought, Part III identifies how thoughts are verbalized, Part IV explores thought-related issues, Part V discusses some common ways of orienting thoughts, and Part VI concentrates on the emotional dimension of thoughts.

Part I starts with Chapter 1 ('Background'), which states that this book aims at the complexity of language, thought, consciousness, imagery, memory and imagination from the perspective of thought (7). For Chafe, the ability to link thoughts with sound defines what language is. He uses an interesting metaphor to explain why the thought-based approach is chosen: the full nature of language is a mountain whose summit is occupied by thoughts. From bottom to top are phonetics, phonology, syntax, semantics and thoughts respectively. Thought is on the top with thinner air and thicker fog (10). While many linguists climb from phonetics to phonology or from syntax to semantics as their final goal, hardly anyone is devoted to the realm of thought because the higher you go the more risk and disagreement you will face. That is why the author chooses the route less taken. Chapter 2 ('Ground rules') argues that understanding is built on observation and theories. While observed data must be natural and objective, linguistic theories should attach importance to the diachronic dimension because heavy reliance on synchronic interpretations ignores the history of the data on which understanding is based (14).

Part II systematically sets out various properties of thoughts. In Chapter 3 ('The priority of thoughts'), fieldwork on Onondaga (an Iroquoian language spoken in the USA and Canada) shows that when a word such as *onú:dó:da* 'hill' is presented to Onondaga speakers, the meaning of the word is primary and salient relative to its sounds. Then, Chapter 4 ('The path from a thought to a sound') schematizes the verbalization path as 'thought → semantic structure → syntactic structure → symbolization → abstract phonology → overt phonology → sound' (30). Chapter 5 ('How thoughts are structured') identifies three universal thought

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structures, namely, events, states and entities. Chapter 6 ('How thoughts are experienced') asserts that it is wrong to equate thinking with language because thoughts can be experienced as unreflective consciousness, imagination, emotions or silent language. Chapter 7 ('How thoughts are shared') argues that speaking and listening are quick, natural, interactive and effortless, whereas writing and reading are slow, separated, unnatural and difficult. Chapter 8 ('How thoughts flow through time') elaborates on the coherence of thoughts at different levels of discourse segments. The place of discourse segments in the flow of thought is divided into focus of consciousness, center of interest and topic. The focus of consciousness is reflected in intonation units (e.g. pause, syllables, pitch), which signify the minimal thought unit. The center of interest is encoded in a prosodic sentence, a complete thought equivalent to 'a sequence of foci of consciousness' (63). Topic denotes stable and generalized thoughts, with basic-level topics, subtopics and supertopics.

In our view, Part II touches upon the deep side of thought like the way we explore an iceberg under water. Although the shape of thought is invisible, Chafe's analysis makes good use of language resources to disclose the essence of thought, just as we use the part of iceberg on the water to reason about the shape of the whole iceberg. However, it appears that the design of Chapter 8, which focuses on discourse analysis, does not hold well with the content of other chapters.

Part III compares English and Seneca (an Iroquoian language spoken in the USA) in the process of verbalization. Chapter 9 ('From a thought to a sound in English') radically assumes that, in English, prosody and gesture may bypass syntactic structure and phonology, and a more direct path can be composed, namely 'thought → semantic structure → symbolization → prosody and gesture → sound' (82). Chapter 10 ('From a thought to a sound in a polysynthetic language') demonstrates that Seneca heavily relies on morphology to convey thoughts, so the path can be revised as 'thought → semantic structure → morphosyntactic structure → symbolization → reconstructed phonology → surface phonology → sound' (85). Notably, Seneca can express in one word what English may package in five words. In Seneca, extensive morphological changes lead to phonological changes and the meanings within a verb can be extended when need arises (90). The interesting findings in Part III have great implications for the form–meaning mapping interface and provide evidence for cognitive diversity.

Part IV shifts to a wider range of topics about thought. While the range is impressive, it does mean that chapters in this part do not fit together well as a whole. In Chapter 11 ('The translation paradox'), Chafe regards thought as the core of translation and states that any distortion in the process of thought transfer would lead to failure in translation. For example, the Seneca word *da:digwe:göh*, which is a combination of 'negative + masculine plural + all + stative' (96), is translated into 'not all of them' in English. Although the thought is similar, the English translation fails to encode the ideas of minimal number and gender. Chapter 12 ('Repeated verbalizations of the same thought') claims that when a thought is repeatedly expressed, it may be paired with partially different semantic

structures and sounds due to partial change of the processes by which thoughts are verbalized. Chapter 13 ('Rethinking Whorf') categorizes the thought–language interface into two processes. In the process of 'extralinguistic experience → thought → semantic structure' (108), both thought and semantic structure are determined by the interaction with the external world. In the process of 'semantic structures → thought → extralinguistic experience' (108), the semantic inventory of a language guides conceptualization of the external world to one that is readily encodable in the language (Slobin 1996). While the first process is independent of Whorf's proposal, the second process supports the idea that language does shape thoughts. For Chafe, ignorance of either process may lead to misinterpretations of the Whorfian hypothesis. Chapter 14 ('Lessons from literature') contends that literature opens a window into the nature of thought. Two ways a writer presents thoughts in fictional literature are observed. One is a mimesis approach which demonstrates a character's thoughts from the inside of the character's mind. The other is a diegesis approach which describes the thoughts from the outside of the character's mind.

Part V explores some intriguing ways thoughts are oriented. Chapter 15 ('Small numbers and subitizing') discusses our ability to process small numbers of objects by means of categories such as oneness, twoness, and threeness. Studies on subitizing indicate that we can process small numbers holistically in parallel at an intermediate stage only if the number is below a certain upper limit (e.g. three). When that limit is surpassed, serial processing is required, as in counting (128). In languages, very small numbers can be categorized as a unitary item, say, we can have a 'three' category just as we have a category of 'dog' (129). When the number exceeds the limit, it is impossible to recognize such a category as 'seventeen' immediately in consciousness. Chapter 16 ('Thoughts and gender') finds that the masculine gender prefixes in Iroquoian languages (i.e. Seneca, Mohawk, Oneida, Onondaga, Cayuga, Huron, Wendat) are affected by ways of thinking in the Iroquois society where men are more salient in decision making (though women are more powerful in some aspects). Chapter 17 ('Time, tense, memory, and imagination') stresses that variations of tense and aspect on a time line are not arbitrary but are determined by different ways people think about events, imagine events, and experience memories of events. Chapter 18 ('Relating ideas to reality') investigates evidentiality and certainty across languages. In doing so, the ways languages associate thoughts with speakers' conceptions of reality are clearly exhibited.

Part V is a valuable addition to the heated issues concerning cognitive science, in which thought, time, processing patterns, evidentiality, social and cultural plasticity constantly attract scholars from different fields. For this reason, this part is an eye-opener for researchers who are engaged in the common ways language orients thoughts.

Part VI turns to the emotional component of thoughts. In Chapter 19 ('Emotional involvement in a conversation'), Chafe examines pitch contours, intensity, timing and voice quality in different samples of speech to show the relationship

between emotional regulation and the flow of thoughts in the contexts of topic shifting, anticipating something, showing contrast, or doing subjective evaluation. Chapter 20 ('The feeling of nonseriousness') observes the emotional experiences in humor, feelings that can be expressed explicitly with laughter. Chafe makes the bold claim that humor and laughter reflect the nature of human thought. Chapter 21 ('How language can be beautiful') contends that the emotional component of poetry can be stimulated by both the sound side (i.e. meter, rhyme) and the thought side (i.e. the poet's consciousness), whereas the emotional element of prose is largely attributed to the thought side of language.

In sum, Chafe offers an insightful account of the thought-based approach to linguistics, making explicit the connection between language, thought, mind, consciousness, and brain. The prominent strengths lie in three aspects. First, this book is an enlightening interdisciplinary work integrating the fruits of linguistics, psychology (Chapters 6, 8, 15, 17), translation studies (Chapter 11), and literature (Chapters 14, 21). Cross-disciplinary approaches are joined together cleverly to reveal how thoughts are expressed and oriented. Second, cross-linguistic and usage-based data is widely employed, including data drawn from the Pear Film (a seven-minute film showing a boy's theft of pears; Chapter 8), table conversation (Chapter 12), dialects (Chapter 16), eyewitness testimony (Chapter 17), and typological data of evidentiality (Chapter 18), etc. The data involves a large variety of languages such as Seneca, Onondaga, Mohawk, English, Japanese, French, German, Wintu, and Caddo. Third, the importance of the brain in linking thought and language is highlighted. For instance, Chapters 5 and 8 note that idea processing and affect processing are localized in the neocortex and subcortex, respectively. Neural connections exist not only between the neocortex of ideas and the motor systems controlling tongue and lip movements, but also between the subcortex of emotion and the system controlling the lungs and larynx.

Although connections between some sections are not always obviously clear, this book offers an inspiring perspective on thought-based linguistics. It will no doubt benefit researchers who are interested in the relationship between language, thought, mind, consciousness, and brain.

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