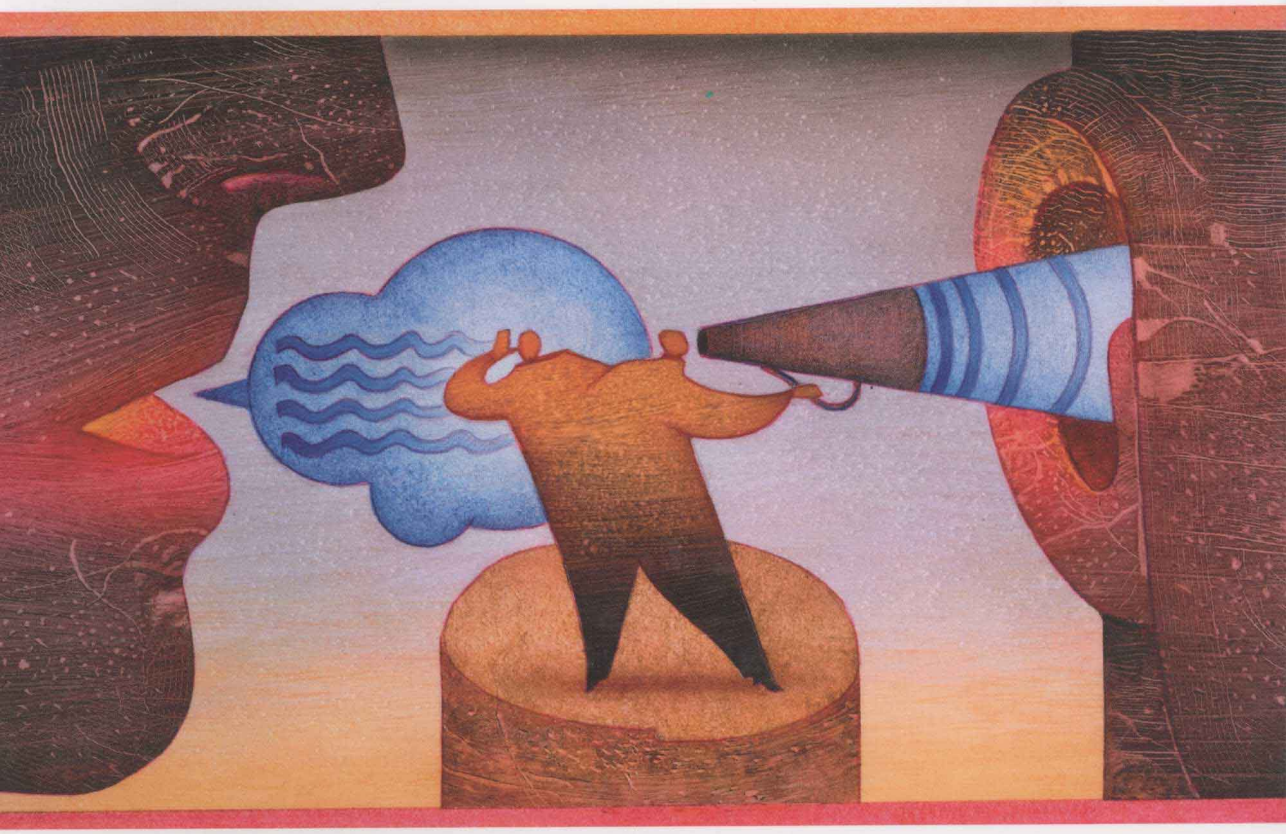
TALKING THE TALK

Language, Psychology and Science

TREVOR A. HARLEY



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Talking the Talk

Language makes us human, but how do we use it and how do children learn it? *Talking the Talk* is an introduction to the psychology of language. Written for the reader with no background in the area or knowledge of psychology, it explains how we actually "do" language: how we speak, listen, and read.

This book provides an accessible and comprehensive introduction to psycholinguistics, the study of the psychological processes involved in language. It shows how it's possible to study language experimentally, and how psychologists use these experiments to build models of language processing. The book focuses on controversy in modern psycholinguistics, and covers all the main topics, including how children acquire language, how language is related to the brain, and what can go wrong – and what can be done when something does go wrong.

Structured around questions that people often ask about language, the emphasis of *Talking the Talk* is how scientific knowledge can be applied to practical problems. This book also stresses how language is related to other aspects of psychology, particularly in whether animals can learn language, and the relation between language and thought.

Lively and amusing, the book will be essential reading for all undergraduate students and those new to the topic, as well as the interested lay reader.

Trevor A. Harley completed his undergraduate degree and PhD at the University of Cambridge. He moved to the University of Dundee in 1996 from the University of Warwick. He holds a Personal Chair in Cognitive Psychology and is currently Head of the School of Psychology. He is a Chartered Psychologist and his main research interest is in normal and pathological speech production.

Dedication

To Siobhan, Sheila, Hazel, and Bill too

Preface

Preface

I am lucky enough to be the author of a successful text on the psychology of language. I know it must be successful because it's reached its third edition. Why then does the world need yet another book on the psychology of language, particularly another by Trevor Harley?

I hope this book will find a different readership from my text *The Psychology of Language* – although of course I hope eventually everyone will read both. I think there is room for a more introductory book; I also hope there is room for something a bit more personal. There are a number of popular and semi-popular books on language already available, but I think this is the most up-to-date one about the *processes* involved in producing and understanding language. I want it to be read by psychology and linguistics undergraduates, by people who want to learn about the subject before university, and, perhaps most importantly of all, by the lay reader. In short, I hope that it will be perfect reading for anyone who wants to know about how we think and how we communicate. With a bit of luck, the film rights will soon follow.

I hope therefore that it's also one of the most approachable books on the subject. I think that the psychology of language has become an increasingly complex and difficult subject over the past 10 years or so. The third edition (2008) of my text is considerably longer and harder

than the first (1995). The subject is certainly one many undergraduates find difficult, I think for two main reasons.

First, there is now so much material available. My main text is already huge, but still some researchers and teachers wanted me to include more about this topic, while others wanted more of that topic. Clearly there are limits to how big a text can be! Indeed, I think the world needs a shorter overview, not a longer one. Brevity can only be achieved at the cost of selection, and my personal preferences and interests reveal themselves in this selection. Omitting something, however, is bound to upset someone.

The second reason people find the psychology of language difficult is that often it is difficult to come to any conclusion other than "we don't yet know". We are often left with two (or more!) alternative explanations of the same data, and it is rare that we can say with near certainty that this is how the mind always works. This lack of certainly is unsettling. In this book, although I've obviously tried to be balanced, I have tried to come to some definite conclusion more often, which means saying what I think is the more likely or compelling conclusion. I could of course be wrong, and again it will offend people. I've tried to avoid going into the details of the arguments and counter-arguments that pervade modern psycholinguistics, and I hope the consequences are clarity and simplicity – but not over-simplicity.

Because I've wanted to tell more of a story, I've avoided putting too many detours around the main theme, and I've tried to keep the number of references to a minimum. If I've missed something important out, I'm sorry. Not everything can be included. Although I've tried to show something of the controversies active in current research, for a book such as this I think the tried-and-tested results are more robust and their contribution to knowledge easier to assess, so there is a bias towards older references (say, compared with my text) – these older references, as well as standing the test of time, also often contain the first systematic description of the basic data that often remain to be fully explained. Because I'm trying to tell a story, I think the book is best read like a novel, from beginning to end; it's not meant to be dipped into. The section with further reading ("Next") also contains some sidelines and additional ideas that would have disrupted the flow of the main text if they'd been put there.

So in addition to being shorter, more selective, more approachable, and personal, this book might be more upsetting to more people; perhaps the more people it upsets, the more successful it has been. The last thing I want to do, though, is upset someone because of an inaccuracy, or misreporting or misunderstanding something. One of the most time-consuming aspects of writing a book such as this is checking things. Nevertheless, I will be amazed if some errors haven't crept in. If you spot any, or think I have presented something unfairly, I'd love to know about it, preferably by email (currently *t.a.harley@dundee.ac.uk*).

I have one other wish, and that is that this book goes some way to persuading people that cognitive psychology is a real science. Psychology sometimes gets a bad

press: it's a very broad subject, tackled by many different sorts of approaches, but I think the experimental (in tandem with the computational–mathematical) approach has made huge strides in understanding human behaviour. Just because the subject of the subject is ourselves doesn't make the enterprise any less scientific. Psychology is a real science, up there with physics, chemistry, and biology. Indeed, in many ways if you want to see science working the processes are clearer in psychology. This preamble just explains the subtitle of the book – and is another reason why the psychology of language is hard.

I'd like to thank Matt Jarvis, Alan Kennedy, Annukka Lindell, Nick Lund, and Glen Whitehead for their comments on a draft of this book. I promise I considered every suggestion made very carefully, even if I didn't implement them all. It might of course be that the suggestions I ignored will turn out to have been correct. I am particularly and eternally grateful to them for helping me avoid making several potentially very embarrassing errors. I'd particularly like to thank Bill Thompson for reading a draft with the intelligent lay person's eye (and brain). I owe him a very great debt. I haven't always taken his advice, but seeing the book through his brain was an exceptionally helpful (if occasionally odd) experience. This book was planned and written in Scrivener on an Apple iMac. I can't imagine doing it any other way. All the photographs (bar one) are my own.

Professor Trevor Harley
University of Dundee
May 2009

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Chapter 1

Language

chapter 1

I HAVE A FRIEND who says that studying the psychology of language is a waste of time. He expounds this idea very eloquently and at great length. He says it in nice, beautifully enunciated – if rather loud – sentences to anyone who will listen (and often to people who won't). I think this irony is wasted on him.

One of his reasons for thinking that investigating language is pointless is that, according to him, there's nothing special about language. We learn language as we learn any other skill: we learn to speak like we might learn to ride a bike. It makes use of the same psychological resources and processes as everything else we do. For him there's no difference between speaking a sentence and navigating our way home.

I think he wants things both ways, because when I put the alternative to him – that there is something special about language, that maybe we don't learn it like we learn other things, and maybe it doesn't use the same psychological processes as everything else – he says that in that case it's just a special case, and therefore not very interesting either.

Using language is one of the most impressive things we do. I find only vision comes close. We routinely produce utterances of amazing complexity and originality. Think

back to the last few things you've said; have you ever said exactly those things before? Probably not, or if you have, you won't have to wait long before you say something no one else in the world has ever said in just that way ever before. Our use of language is creative. We combine words and sentence structures in novel ways all the time. And we do this combination incredibly quickly and with amazing accuracy. We can do this combination in speech or writing. We can also decode what other people say – we listen and read, and extract the meaning and intended message, again apparently effortlessly.

Language is also important. We spend a lot of time using it or even just thinking in it. Most of us have a running voice in the head telling us what to do and what we're thinking, and it's easy to think of that voice as being the core of us. The complexity of modern life is unthinkable without it: how could we have designed and built cars, computers, and atom smashers without it? Indeed, it's difficult to imagine being human without language.

Perhaps unwittingly, my conversations with my friend touch upon three of the most interesting issues in the modern study of language. First, how do we actually *do* language? What are the processes involved in speaking, writing, listening, and reading? Second, how do children acquire language? They're not born talking, but they soon are chattering away, if not at first quite like adults. Third, to what extent does acquiring and using language depend on knowledge and mechanisms specific to language?

This book is about the psychology of language. I find the "psychology of language" to be a bit of a mouthful, and what on earth do you call people who do it? Psychologists of language? In the sixties and seventies there was a perfectly good word, "psycholinguistics", with the people who did psycholinguistics called psycholinguists. For reasons I've never understood these words became unfashionable about the same time as flares stopped being widely available. I don't think these events were linked, but perhaps if "psycholinguistics" can be brought back into fashion, even flares stand a chance again.

"Psycholinguistics" and "psycholinguists": I'm going to use these words. Perhaps they will be deservedly revived.

What is language?

Type "language definition" in to your favourite search engine. Here's one I've adapted from www.thefreedictionary.com, according to which language is:

1 communication of thoughts and feelings through a system of arbitrary signs such as voice sounds or gestures
2 such a system including its rules for combining its components such as words
3 such a system as used by a nation or people.

This definition covers the most important aspects of what language is, but it's worth considering these points in more detail.

First, language is primarily a system for communication: its main purpose is to transfer information from one person to another. I think I'd add to this point that the communication is intended. Animals communicate to each other – for example, a blackbird singing communicates that a male is resident in a territory and available to females – but it's far from obvious that there is always a deliberate intention to convey information. In contrast, when we talk, we intend to convey specific information. This is not to say that everything we communicate is intentional: I might say something foolish and thereby communicate my ignorance, but this is a side-effect of what I say rather than its main effect, and certainly language didn't arise to convey side-effects. It is also not to say that the only function of language is strictly intentional communication: we often use language for social bonding, as a means of emotional expression ("darnation!", and sometimes perhaps a little stronger), and even for play (telling puns and jokes). And language seems to play a central role in guiding and perhaps even determining our thoughts.

Second, language is a system of words and rules for combining them. Words mean something; they are signs that stand for something. "Cat", "chase", "rat, "truth", "kick", and "big" all refer to objects in the world, events, ideas, actions, or properties of things. We know thousands of words: we know their meanings, and what they look and sound like. All this knowledge is stored in a huge mental dictionary we call the *lexicon*. But language is clearly much more than a list of words; we combine words together to form sentences, and sentences convey complex meanings about the relation between things: essentially, who did what to whom. But we don't just combine words in any old fashion; like computer languages, we can only combine words in particular ways. We can say "the cat chases the rat" or "the rat chases the cat", but not "the cat rat the chases" or "the the chases cat rat". That is, we know some rules that enable us to combine words together in particular ways. We call these rules the *syntactic rules* (sometimes just the *syntax*) of the language. What is more, word order is vitally important (in languages such as English at least): "the cat chases the rat" means something different from "the rat chases the cat". It is our ability to use rules to combine words that gives language its immense power, and that enables us to convey a huge (infinite, in fact) number of ideas.

The distinction between the lexicon and syntax is an important one in psycholinguistics. If syntax makes you think of grammar, you're right: we use the word *grammar* in a more general way to describe the complete set of rules that describe a language, primarily the syntax, how words can be made up, and even what sorts of sounds are permitted and how they are combined in a particular language. Be warned, though, that "grammar" is unfortunately one of those words that can mean what we want it to mean; sometimes it's used almost synonymously with "syntax", sometimes as the more general term to refer to the complete set of rules for a language. No wonder psycholinguistics is hard.

Third, the relation between the meaning and appearance or sound of words is arbitrary: you can't tell what a word means just by hearing it; you have to know it. Of course there are a few words that sound rather like what they depict (such words are called onomatopoeic) – but there are just a few, and even then the meaning isn't completely predictable. "Whisper" sounds a bit like the sound of whispering, but perhaps "sisper" would have done just as well. Knowing how "hermeneutical" is pronounced tells you nothing about what it means.

Fourth, although we have defined language in the abstract, there are many specific languages in the world. We say that English, French, Russian, and Igbo (a Nigerian language) are all different languages, but they are nevertheless all *types* of language: they all use words and syntactic rules to form messages.

How do languages differ?

A motif of this book is how bad I am at language and languages. I'm not proud of this fact; it's just the way it is. Indeed, I think I should have your sympathy for reasons that will become apparent later. It's perhaps odd that someone so bad at language should carry out research into language, but perhaps there's something in the adage about psychologists really just being interested in their own particular problems. Being hopeless at foreign (to me) languages, I had to ask members of my linguistically diverse psychology department how they would say the following in their own languages (I could manage the first):

The cat on the mat chased the giant rat. (English)
Le chat qui était sur le tapis a couru après le rat géant. (French)
Die Katze auf der Matte jagte die gigantische Ratte. (German)
Il gatto sullo stoino inseguiva il topo gigante. (Italian)
De kat op de mat joeg op de gigantische rat. (Dutch)
Pisica de pe pres a sarit la sobolanul gigantic. (Romanian)
Kot który był na macie, gonił ogromnego szczura. (Polish)
A macska a szőnyegen kergette az óriás patkányt. (Hungarian)
Matto-no ue-no neko-ga ookina nezumi-o oikaketa. (Japanese)

I think I know what's going on in the French, Dutch, and German translations. It is fairly obvious that there are similarities between them and English, and I remember enough school French to be able to work out the rest. Italian looks a bit more different to me but is still recognisable. Polish, Hungarian, and Japanese are very different and unrecognisable to me; for all I know, my colleagues could be pulling my leg and causing me to write unwitting obscenities. I apologise if they have.

There are differences other than just the vocabulary ("cat", "chat", and "Katze" all mean the same thing). In German what is called the *case* of the noun

and the form of the verb are much more important than in English; the form of nouns and verbs changes by a process called *inflection* to reflect their grammatical role – for example, whether something is the subject or the object of the sentence – the thing doing the action or the thing having the action done to it. (There are other cases: I still remember nominative, accusative, vocative, genitive, and dative from my Latin lessons.) We do this a bit in English, when, for example, we use "she" as the subject of the sentence and "her" as the object, but nowhere near as much as in heavily inflected languages, of which German is one. If you know any Latin, you will realise that Latin is extremely heavily inflected, so much so that word order is relatively unimportant. To satisfy my nostalgia for being 12 again, here are the inflected cases of a Latin word, *stella* ("star"):

stella – the star	stellae – the stars (nominative case)
stella – o star	stellae – o stars (vocative)
stellam – the star	stellas – the stars (accusative, for direct objects)
stellae – of the star	stellarum – of the stars (genitive)
stellae – to the star	stellis – to the stars (dative)
stella – from the star	stellis – from the stars (ablative)

Japanese constructs its sentences very differently: I'm told the best translation is "mat on cat big rat chased"; notice how in Japanese also the verb comes at the end of the sentence. Turkish, like Finnish, Japanese, and Swahili, runs words modifying each other together, making it what is called an *agglutinative* language. Here is an example:

Ögretemediklerimizdenmisiniz? – Are you the one who we failed to teach?

(Where *Ögret* – to teach, *emedik* – failed, *lerimiz* – we, *den* – are you, *misiniz* – the one who). In agglutinative languages each unit in a word expresses a particular grammatical meaning in a very clear way.

The sounds different languages use can differ, too. To an English speaker, the properly pronounced "ch" sound in the Scottish "loch" and German "Bach" sounds slightly odd; that's because it's not a sound used in "normal" English. Technically, it's called a *voiceless velar frictative* because of the way it's made and the vocal tract being constricted as air is pushed out through it, and English doesn't use voiceless velar fricatives (see Figure 1.1 for a diagram of the articulatory apparatus). Arabic sounds different to English speakers because it makes use of *pharyngeal* sounds, where the root of the tongue is raised to the pharynx at the back of the mouth – and, of course, English sounds different to Arabic speakers because English doesn't make use of pharyngeal sounds. Some African languages, such as Bantu and Khoisan, make use of loud click sounds as consonants. Japanese doesn't make a distinction between the "l" and "r" sounds, which is