

### How Language Makes Meaning

Language's key function is to enable human social interaction, for which people are motivated to engage by powerful brain mechanisms. This book integrates recent work on embodied simulations, traditional meaning-making processes and a myriad of semantic and other meaning contributors to formulate a new model of how language functions, following a pattern of conjoined antonymy. It investigates how embodied simulations, semantic information, deviation, omission, indirectness, figurativity, language play, and other processes leverage rich meaning from only a few words by using inherently biological, cognitive, and social frameworks. The interaction of these meaning-making components of language is described and a language-functioning model based on recent neuroscientific research is laid out to allow for a more complete understanding of how language operates.

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# How Language Makes Meaning

Embodiment and Conjoined Antonymy

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### CAMBRIDGE UNIVERSITY PRESS

University Printing House, Cambridge CB2 8BS, United Kingdom

One Liberty Plaza, 20th Floor, New York, NY 10006, USA

477 Williamstown Road, Port Melbourne, VIC 3207, Australia

314-321, 3rd Floor, Plot 3, Splendor Forum, Jasola District Centre, New Delhi - 110025, India

103 Penang Road, #05-06/07, Visioncrest Commercial, Singapore 238467

Cambridge University Press is part of the University of Cambridge.

It furthers the University's mission by disseminating knowledge in the pursuit of education, learning and research at the highest international levels of excellence.

www.cambridge.org

Information on this title: www.cambridge.org/9781009246026

DOI: 10.1017/9781108377546

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First published 2019 First paperback edition 2022

A catalogue record for this publication is available from the British Library

ISBN 978-1-108-42165-2 Hardback ISBN 978-1-009-24602-6 Paperback

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> My words are a bridge with load limits; sturdily enough made but there are some weights just too much, just too heavy that still insist on crossing.

-Michael Penny, poem 12, Outside, Inside

My mind watches my mind being a mind. In the standing back things are clear, an attitude immeasurable towards something watchable though not knowing what.

-Michael Penny, poem 16, Outside, Inside

I walk on small roundish feet on a small roundish planet and what pushes up through my feet pulls down my thoughts. I am earth-bound, because I believe it's gravity which makes me profound.

-Michael Penny, poem 170, Outside, Inside



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### Preface

Imagine a pianist playing a song. She is very skilled – mastering the strike and fade of each note – some crisp, some smoky. Holding each key for the ideal length. Sequencing the chords in precise order. Allowing some notes to overlap, spreading others out – pausing perfectly in between. Melding and swaying the tapestry of tones for a lilting melodic appeal. Enhancing and softening the overall intensity, speeding and slowing the tempo, building to crescendos, and then savoring their aftermath. Tickling your ear with a glissando at one moment and awing it the next with an audio-psychedelic wall of sound.

If you've ever heard and appreciate really good piano music and its playing, in any genre, you know how good an experience this can be.

But imagine this particular piano is special. Instead of each note causing only an auditory experience, imagine they trigger something much fuller. When played, each individual note forces a hearer to relive, if only briefly, a small but specific concrete experience in their past life. Some experiences are things seen or heard. Others are physical feelings or movements. One note, for instance, instantly conjures the experience of honey – its earthy but light sweetness, its amber color, its lava texture and viscosity, the way it can be creamy or crystally or sticky – the resistance it gives a spoon when you scoop out a dollop. Another note recalls the experience of pulling, as in drawing something heavy toward yourself. The way your arms are extended in front asymptotically, hands tightly gripping, back bowed forward, feet planted firmly, supplicating for the pull. Then the exertion, the pulse of strength, the head back, the legs anchored, and the clenching force of all your muscles as you extract the thing from its mount.

Another note gives you tomatoes. Still another, a deep inhale sniff. One note conjures metal. Another the color salmon. Still other notes give you guitar, lightbulb, tree, ant-stepping, strolling, pillow, cold, sliding, reaching up, orange (the color or fruit), sky, milk, woman, sitting, mic stand, thumb, fried eggs, pickles, roof, nausea, and so on, seemingly endlessly, through all the vivid bits of your past sensory and motor experiences.

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Pretty amazing, isn't it? A piano like this would be nothing less than a virtual reality machine, and a full-bodied one at that. By playing the keys of the piano in a particular sequence and style, the pianist can make you relive entire past life episodes, or experience altogether new ones. It's also remotely controlled – it can be used on you from within the room or across a valley, or even from a recording, just so long as you can hear the notes.

Perhaps even more amazing, nearly all modern humans who have ever lived own such a piano and play it nearly every day of their lives. Indeed, nearly all of us are virtuosos. We also hear other people's piano music much of the time and experience vast new realities because of it. Most of us can even read piano music off a page, although this is a relatively recent development in human history. Many people can even compose music onto a page, but not everyone is good at it.

This piano is language. I've been "playing" it for you since you opened this book. You've been "hearing" the music and experiencing the meaning it has wrought for you.

There is a slight difference, though, between our magic piano and language. Language doesn't actually give you all these experiences in the full intensity described here. Language doesn't completely take over your body, moving you avatar-like at the will and whim of the piano player. It doesn't slip you into an hallucination trance where you lose all sensory contact with the present, surrendering completely to the sensory and movement illusions rendered for you by the words. It instead does something a bit less taxing than that, but also no less amazing – it gives you meaning. But it does so under the table.

Language achieves meaning because the brain regions associated with all those sensory and motor and possibly other past experiences are indeed activated by language. Those activation patterns are also extremely similar to ones occurring during real experiences (e.g., actually seeing a giraffe or genuinely paddling a canoe). But the brain regions are mostly and temporarily cut off from your body when they're activated by language, much like what occurs during REM sleep dreaming. Your brain looks like you're seeing a giraffe or paddling a canoe, but you aren't. So you are given a state of enriched meaning by encountering language such as, running up a set of narrow, creaky wooden stairs in an old downtown office building, to arrive at a dingy, bare-lightbulb-lit, institutional green-painted landing, with arched black and gold letters spelling, "Sam Tracey, Private

<sup>&</sup>lt;sup>1</sup> There may be exceptions to this general truth in the case of certain religious experiences, trance states, or hypnoses brought on by language. Or even just very captivating language that triggers powerful mental imagery which shrouds present sensory or motor experience.



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Detective," peeling off the old frosted-glass office door, without really having experienced or hallucinated running, hearing, seeing things, etc. Language is essentially a form of *direct deposit*; you get the meaning without having to handle the cash.

You thus end up, when hearing or reading language, in a state something like as-if-I-just-sorta-experienced X when you hear the tune for X. Moreover, this as-if-I-just-sorta-experienced experience itself IS meaning, or rather one large part of it. You have not just done X. You have not hallucinated X. But you do have a vivid and full understanding of X, enriched by all your past experiences of the parts of X brought up by the embodied simulations triggered by the language describing X.

So if embodied simulations are only part of how a language makes meaning, what then are the other parts of meaning? What more is there than the mere as-if-I-just-sorta-experienced experience of X, enabled by embodied simulations? One additional part is that, despite what was just described about most language, some of those embodied simulations might indeed rise to something like the level of the takeover described of the magic piano. Some sensory simulations can be especially strong, to the point where you experience something like actually seeing things. Very novel, rich, or vivid language can take your comprehension nearly to this level of sensory takeover in the form of poignant mental imagery (Rasse, 2017; Hakemulder, Kuijpers, Tan, Balint, & Doicaru, 2017). Vivid, near-to-real experiences can also occur through other senses and described motor activities. Strong emotions can certainly be triggered by language as can other experiences (e.g., things strongly associated with mental or movement images).<sup>2</sup>

Whether such a takeover occurs depends in part on a number of factors. The speed of language delivery is one. The stealthiness of the delivery can matter as well. Language delivered with timing arranged to allow the rich full sensory and motor embodied simulations to peak can aid their potential maximization at takeover. Sequencing the peaks of several embodied simulations so they mesh perfectly – for instance, one embodied simulation rising at the ideal fading point of a previous one – can maximize their impact as well as afford meta-meanings from their blending and juxtaposition. If language is monotone or delivered in too rapid-fire a pace – with one embodied simulation wiping out a previous one before it can peak – then less than full sensory takeover will occur.<sup>3</sup>

<sup>&</sup>lt;sup>2</sup> All one need do to see this is to recall experiences where a speaker "put an image into your head" perhaps of the too-much-information variety, of which you cannot rid yourself.

<sup>&</sup>lt;sup>3</sup> These parameters also affect the quality of meaning derivation under normal comprehension circumstances, when simulations are not producing "takeover."



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Other parts of meaning stem from the syntactic or morphosyntactic structures in which the simulation-triggering morphemes, words, or phrases are embedded – the chords, stanzas, refrains, and choruses if you will, that arrange the notes in the piano music (Bergen, 2012). These structures corral the sequencing, spacing, blending, repetition, interweaving, and other choreography of the words/notes/simulations you encounter. In this sense, the morphosyntactic structures contribute meaning of their own by both honing *how each* individual embodied simulation progresses, and affording nuanced meaning themselves through the *melding of multiple* embodied simulations (e.g., a piano chord of F-sharp played amid an ascending sequence is very different than just the individual note F-sharp played alone).<sup>4</sup>

The account of language presented thus far has emerged in essentially the last couple of decades. Prior to that, many scholars, in fields from philosophy to cognitive science, had struggled with the idea of meaning, attempting for centuries really to describe and explain it. But only recently have we gained some serious traction. The rise of the idea of embodied simulations as briefly just described, as essentially the crux (or more accurately a crux) of how meaning works in language, has been a bit of a revolution (Aziz-Zadeh, 2013; Barsalou, 2010, 2016; Bergen, 2012; Boroditsky & Ramscar, 2002; Boulenger, Hauk, & Pulvermuller, 2009; Casasanto & Dijkstrka, 2010; Chatterjee, 2008, 2010; Colston, 2017a; Dove, 2009; Fernardino, Contant, Binder, Blindauer, Hiner, Spangler, & Desai, 2013; Fischer & Zwaan, 2008; Gallese & Lakoff, 2005; Gibbs, 1994, 2006; Glenberg, 2010; Glenberg & Kaschak, 2002; Hauk & Pulvermuller, 2004; Kable, Kan, Wilson, Thompson-Schill, Chatterjee, 2005; Kable, Lease-Spellmeyer, & Chatterjee, 2002; Kemmerer, Castillo, Talavage, Patterson, & Wiley, 2008; Mahon & Caramazza, 2008; Pecher & Zwann, 2005; Raposo, Moss, Stamatakis, & Tyler, 2009; Richardson, Spivey, Barsalou, & McRae, 2003; Saygin, McCullough, Alac, & Emmorey, 2010; Wallentin, Nielsen, Vuust, Dohn, Roepstorff, & Lund, 2011; Wallentin, Ostergaard, Lund, Ostergaard, & Roepstorff, 2005; Watson, Cardillo, Ianni, & Chatterjee, 2013; Zwaan & Taylor, 2006).

Embodied simulations provide us with a gold standard by which to understand language as a form of currency in human communication/interaction. According to a gold standard, the value of a unit of currency is

<sup>&</sup>lt;sup>4</sup> Or, to invoke yet another metaphor – that of a food recipe. The ingredient list in a recipe is only part of the picture; the preparation portion matters crucially as well. Embodied simulations are like the ingredients in this metaphor; the syntax/morphosyntax is then the sequence of procedures done on the ingredients to complete the recipe.



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anchored to the genuine value of the amount of gold the currency note represents. In the same way, words or phrases have meaning in part because they are anchored to the embodied simulation(s) they trigger in a person's mind.

But just as the "genuine value of the amount of gold" is *itself* part of a much more complex human system, so are embodied simulations part of something much bigger. The *wealth or value* of gold is dependent on many phenomena like rarity, relative rarity, the *perception* of rarity, competitiveness, ownership, entitlement, possession, exclusion, prestige, aesthetic appreciation, unusualness, value, wealth, association, and many other notions, all of which are inherently social constructions arising from the intersection of the material world and human interaction. As this book will hopefully demonstrate, so too are embodied simulations only a part of a much broader framework used to achieve meaning.

The main additional part of language to be treated in this book is, in a way, the counterpart to embodied simulations. The shared experience wrought by the magic piano can only go so far. An additional "side" of language is needed to indoctrinate embodied simulations amid the myriad of preexisting human *communication* systems. This other side must also usher embodied simulations through the myriad of human *interaction* systems, social and otherwise, which motivate how and why we are together with one another. This other side must finally *fill in* where embodied simulations fall short – giving us a sense of having gainfully exchanged meaning when the actual conscious sharing may have been more skeletal.

This book will attempt to position embodied simulations, and how they leverage lots of meaning from a little language, amid broader, inherently biological, cognitive, and social frameworks. As the value of gold is really only part of the picture of how a currency works, so too are embodied simulations and their morphosyntax only part of the picture of how a language works.



# Acknowledgments

How Language Makes Meaning: Embodiment and Conjoined Antonymy owes its existence in part to David Attenborough. I've been a fan of his as long as I can remember. His passionately intellectual presentations of wondrous and often new, at least to my experience, revelations of the natural living world have always amazed me. He became a star of nature documentaries, so fascinated by and apparently knowledgeable about the phenomena he presented that many people took him to be an actual biologist.

Later in his career he hosted a new program about the Great Barrier Reef off northeast Australia, broadcast in January 2016 on CBC TV in Canada (Geffen et al., 2015). One of the key themes of the program was the interaction between land and sea, which enables growth and formation of the reef. As the continental shelf in this region of Australia/the Pacific Ocean is both very large and very shallow – as well as very warm – relatively minor changes in sea level can convert a huge area back and forth between dry land and sea. This can also occur in a relatively short period of time. Indeed, on the program Mr. Attenborough learns himself just how young the current reef actually is. Oral histories have demonstrated people's knowledge and memory of its beginning – a warming climate since the last ice age re-submerged the area, allowing the reef in its current form to develop. 1 Corals thrive in this warm shallow sea environment, and they've produced the largest and most complex structure ever built by known living beings. This structure also enables thousands of other species to exist, including many that don't actually reside on or near the reef, but whose populations depend on visiting it.

In some ways, this careful balance and interaction between land and sea – seemingly oppositional planet surfaces and environments – and what the balance/interaction supports, resembles the likewise seemingly opposed parts of language this book discusses. In order for the Great

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<sup>&</sup>lt;sup>1</sup> And as a tragic side note, warming sea temperatures may also allow now-living humans to witness its death.



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Barrier Reef to develop, a large relatively level land area is needed.<sup>2</sup> But this land must be submerged under a warm shallow sea. The area also must be adjacent to deep water channels where sea nutrients settle. But strong local currents are also required to churn up those nutrients on which the coral ultimately can feed, at least in part.<sup>3</sup> Those currents are in turn enabled by the land structures in and around the seas, which channel the broader ocean currents in ways that ideally stir the sediments and send them toward the reef. So land and sea are mutually dependent on one another to enable the reef's existence.

This is much like the interdependence of the different contributing mechanisms required for a language to work. On one level, you need some signal-like components that can trigger communicable, largely shared hunks of meaningfulness in people. This source of meaning needs to be as consistent within and between individuals as is possible. Call this the oft-heard and so-called *objective* meaning if you will. This meaning contribution is enabled because the signals trigger preexisting parts of our cognitive functioning which will reverberate similarly in people. These "embodied simulations," predominantly sensory and motor in nature, but possibly also involving other areas (e.g., emotions) provide many of the raw ingredients for constructing meaning.

But this system is by nature a bit messy and inexact, in part because it's cobbled together from other systems that arose earlier to do different things (e.g., the sensory and motor cortical regions controlling perception and action). So other systems must be in place to either hone "symbolic" imprecision or to bolster, prop up, or "rig" things somehow so that meaning exchange and cognitive alignment can happen nonetheless – or can happen well enough at least to warrant cognitive evolution continuing in this direction. These other cognitive systems must also liaise with still other older human communication systems as well as the extensive neuro-social systems that connect us (Lieberman, 2013).

But as with sea and land being mutually dependent in order to enable the Great Barrier Reef, so too are the different language subsystems mutually dependent. The non-"symbolic" parts are not merely serving the inexactness of the "symbolic" ones. The non-"symbolic" half of language brings something all its own to the mixture of meaning, without which language as we know it would not work. It is this relatively stealthy portion of meaning, how it functions, and why it has avoided in part the level of attention of the more "symbolic" portion, that this book is about.

<sup>&</sup>lt;sup>2</sup> Level in that it holds a relatively consistent height above (below) sea level, rather than having no contoured surface features.

<sup>&</sup>lt;sup>3</sup> Coral actually feed on the algae they host within their bodies, which in turn feed directly on the sediment nutrients. Coral additionally feed directly on other animals (zooplankton).



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As Richard Attenborough demonstrated in the CBC program, the water/land interaction isn't just interesting in that it enables coral to build a living structure visible from space. It also enables thousands of other species to exist. So too is it with language – the interaction of the two major meaning contributors has enabled not just our means of communication. It has built our cultural and technological worlds to amazing levels, unlike anything else we know of in nature. <sup>4</sup> This book attempts to describe this complex interaction and the vast, complicated modern human existence it has enabled.

I, of course, have many other people to thank for this book. I'm grateful to the editorial, production, and other people at Cambridge University Press and their affiliates, including Matthew Bennet, for entertaining the initial idea development of this project and Stephen Acerra for his follow-through. My many colleagues and friends with whom I've engaged in multiple delightful discussions and arguments on ideas put forth here. Among those I have to thank are Angeliki Athanasiadou, John Barnden, Greg Bryant, Raymond W. Gibbs, Rachel Giora, Juhani Jarvikivi, Albert Katz, Eleanor Kinney, Gary Libben, John Newman, Elena Nicoladis, Maity Siqueira, Gerard Steen, and Carina Rasse.<sup>5</sup>

Gratitude is also deserved by Morgan Colston for tolerating my frequent hyperactive blatherings on all things figurative, semiotic, ironic, and essentially everything else.

I'm indebted to the staff and other colleagues at the University of Alberta for their endless efforts enabling this work, including Elizabeth French, Joanne McKinnon, Vanessa Ianson, Michael O'Driscoll, and Steve Patton.

Penultimate thanks go to the generous support of the University of Alberta and the Department of Linguistics, SSHRC, the Killam Foundation, and the research colleagues and support people at the Centre for Comparative Psycholinguistics and the Faculty of Arts, who all make this worth doing.

My final gratitude goes to my mother Marlene Colston. My assimilation of her sound and stoic, frequent advice, "You gotta do what you gotta do," not only provides sustainment through the many "crunch times," but it's also a clever colloquial tautology coupled with structural components of asyndeton with hints of phonetic reduction leveraging a variety of complex intertwined cognitive, social, and emotional pragmatic effects including ...

<sup>5</sup> A special thanks to Carina Rasse for discussions on several ideas contained in this work and for inspiring me to complete it.

<sup>&</sup>lt;sup>4</sup> And something also visible from space. Not only is the night side of our planet strewn with pools and canals of lighted cities, our ever-expanding electromagnetic bubble of broadcast language, along with everything with it, will likely make our first contact beyond the planet, if one ever occurs, should anyone be listening.



# A Note on Examples

The discussions in this book contain reviews and mentions of original research studies, observational, corpus, and archival language data, as well as many examples. The latter were selected from a very wide variety of sources including many genres of popular culture (e.g., movies, television programs, novels, advertisements, song lyrics, even cartoons). The latter may obviously have a caricature quality to them, which may actually benefit their intended roles as illustrative examples – occasionally enhancing the very mechanisms or processes they're presented to demonstrate. And as pop cultural material, they're often accessible through Internet and other widely available sources, so they have a ready accessibility to a broad populace. And, indeed, many people may already be familiar with some of the examples because of their popularity, which aids the demonstrative purpose.

But, of course, their scripted nature can make them differ in certain ways, some of them important, from more "authentic" language – either the abstract notion of all the "authentic" language out there since humans have had language or the narrower recorded bits of it. But "authentic" language taking place among unrehearsed interlocutors, creating language from scratch in genuine, live, experienced-in-situ contexts may obviously differ from more scripted examples. I've often maintained that there is nothing inherently more pure, uncontaminated, or just generally better about these "authentic" sources of data. All language takes place in particular contexts, with particular parameters, constraints, and characteristics – even scripted language. So I view these as just different arenas where language can reside, with each being worthy of study. But it holds that the differing characteristics of "authentic" versus more scripted language sources can have great importance to scholars' different research questions.

So I alert the reader to the fact that the examples are not necessarily offered as data qua data, but rather as handy ways to illustrate the language phenomena being discussed. As to the level of representativeness the examples bring for similar phenomena in "authentic" language usage, on the one hand we don't always know the prevalence and nature

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of some of those phenomena in the big universe of "authentic" language usage. So such a representiveness assessment isn't always currently possible. Moreover, the topics covered in the book are often quite difficult to measure for broad prevalence and nature – many of them are not even part of deposited language artifacts (e.g., written words or recorded/transcribed speech or sign), since they take place in camera. And if they are accessible as artifacts, how to quantify those prevalences and natures is a notoriously thorny problem (Colston, 2015). But, given how the popular examples were scripted for ready comprehension, interpretation, and pragmatic effect production in hearers, viewers, and readers, as popular cultural material, they must at least adhere to some general operational parameters of the broader phenomena in that "authentic" universe, or they wouldn't have made it into their various canons.

And lastly, some of the phenomena discussed in the book don't necessarily exist completely in the more "authentic" arena as their very nature makes them belong more or mostly to the relatively scripted world. Satire, parody, and even ad-libbed acting and improv comedy to a degree, along with many other phenomena, are products of language scripting. Yes, speakers may use some imitative practices in their "authentic" live speech, approaching and perhaps even achieving parody, for instance. But in so doing they are de facto becoming scripted in a sense since they must adhere to some established style or known pattern to achieve the parody – i.e., following a script. And even writing almost approaches a pure scriptedness given its slower, more contemplative production process and obviously its revisability. Moreover, the so-called pure, "authentic" forms of language themselves contain many instances of scriptedness, ranging from phatic language to any bit of language a person has used before and so may have honed its content or delivery. And even in cases of purely novel language, some scriptedness can arise if a person is intensely focused on what they're saying and how they're saying it -i.e., choosing their words carefully.

So the borderlands between "authentic" and scripted language in my view are already quite fuzzy. And some forms of almost exclusively scripted language (e.g., satire, impressions, mimicry) belong just as much to our language culture as live, impromptu conversations between live speakers, residing in many genres of language usage (e.g., story-telling, singing, prayer, historical or mythological reenactments, theatrical performances, oral genealogical recitings). And finally, many instances of "authentic" language usage itself also have scripted characteristics to them (e.g., borrowing and speaking a turn of a phrase that worked well for you when you heard it). So the citing of scripted works to help us understand language as a broad human phenomenon may not be as worrisome as some might hold.