

Project title: How can we think in a language?

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Project Description

1.1 Thinking in language

Already in antiquity, language was accorded a prominent role in our mental lives. Plato famously let the stranger in his dialogue *The Sophist* explain that "...thought and speech are the same; only the former, which is a silent inner conversation of the soul with itself, has been given the special name of thought." ([263e]). An early point of contention, however, was whether we think in a *natural* language, as Plato seemed to assume (Gacea 2019), or in a *mental* language, as Augustin claimed (Meier-Oeser 2011). This ancient debate continues to the present day, between those who hold that one kind of thought results from the internalization of speech and those who contend that spoken language is a tool for the expression of thoughts written in a purely mental language.

At the dawn of the cognitive revolution in the 1970's Jerry Fodor revived the debate by arguing that there must be an innate language of thought, which serves as the medium of all reasoning from proposition-bearing thoughts, and that language learning must consist in learning to translate spoken language into the language of thought (Fodor 1975). Fodor's hypothesis continues to reverberate through the psycholinguistics literature (having been transmitted by Levelt 1989). But from the very start, the language of thought hypothesis was challenged to show that an innate language of thought could provide the resources for translating all of the terms of spoken language that we are capable of acquiring.

Partly in reaction to the language of thought hypothesis, the connectionist movement in cognitive science sought to explain much of our reasoning capacity without appeal to sentence-like representations by positing networks of cell-like units that could be trained to recognize abstract patterns (McClelland, Rumelhart 1986, Churchland 1992). An even more radical posture seeks to understand human behavior in terms of body-world relations without positing representations of any kind at all (Shapiro 2014; Chemero 2011; Hutto and Myin 2013). All of these approaches face fundamental difficulties in implementing reasoning from propositional contents.

Several lines of thought that have emerged in the meantime suggest a path between these two extremes. One of these lines of thought, due originally to Vygotsky (Vygotsky 1986) and now vigorously defended in some corners of developmental research (cf., e.g., Fernyhough 2004, 2009, 2016; Alderson-Day and Fernyhough 2015; Geva and Fernyhough 2019), holds that children learn to internalize their speech and that this internalized speech becomes the "basic structure" of the child's thinking (Vygotsky 1999, p. 94).

Further, various claims are advanced about what language can do to enhance cognition. Carruthers and Bermúdez have held that the imaginary sound of an inner voice enables us to become conscious of, and think about, our thoughts (Carruthers 1996, Bermúdez 2003). In later work, Carruthers proposed that thinking in language is a means by which information between various mental modules is exchanged (Carruthers 2002). De Villiers has claimed that mastery of "that"-clauses facilitates the ability to attribute beliefs and desires to other people (De Villiers and Pyers 2002). It has been argued that word learning facilitates object individuation (Xu 2002) and categorization (Lupyan 2012, 2015). Several researchers have provided evidence that

language facilities executive control (Kompa and Mueller 2020) and memory (Baddely 1986; Lupyan 2008).

Studies in animal psychology, while not directly supporting any hypotheses about the format of thought, encourage us to countenance varieties of thought between propositional reasoning and mere association. The thought of great apes goes beyond the mere association of stimuli (Seed et al. 2011) but also does not rise to the level of propositional reasoning found in humans (Povinelli 2000). This in turn supports the hypothesis that even without a language of thought intelligent problem solving is possible.

In philosophy, a recent surge of interest in the nature of imagination also encourages us to expand our list of the varieties of cognition (Langland-Hassan 2016, Kind 2018, Gauker 2020, Myers 2021). It seems clear that we often solve problems by forming imagistic representations, for instance, in moving from one place to another or in putting the parts of a mechanism together.

The path between the extremes that these developments point to consists in the following two hypotheses. First, *spoken language is itself the medium of all propositional thought*. Second, *there are varieties of cognition that do not consist in the production of sentence-like thoughts and these other varieties support the acquisition and use of language*.

In order to accept these hypotheses, two deeply entrenched assumptions need to be exposed and questioned. One is that language is essentially a tool by which speakers reveal to hearers the contents of underlying thoughts. If we say that, then we cannot maintain that the languages we speak are themselves the medium of propositional thought. The other is the assumption that all thought is propositional thought. If all thought were propositional thought and propositional thought were inner conversation, then there would be no kind of thought in terms of which we could explain language acquisition and the processes of deciding what to say and how to react to what is said to us.

In undermining these entrenched assumptions we need to construct positive alternatives. We need a positive conception of interpersonal communication that allows it to be the sort of thing that could usefully take place within a single person. And we need to identify varieties of cognition other than propositional thought in order to explain how spoken language, as the medium of all propositional thought, might be learned and, once learned, effectively used.

1.2 Project-related publications

1. Gauker, C. 2003. *Words without Meaning*. Cambridge, MA: MIT Press.
2. Gauker, C. 2011. *Words and Images: An Essay on the Origin of Ideas*. Oxford: Oxford University Press.
3. Gauker, C. 2017. Three kinds of nonconceptual seeing-as, *Review of Philosophy and Psychology*, 8, 763–779.
4. Gauker, C. 2018. Inner speech as the internalization of outer speech. In *Inner Speech – New Voices*, P. Langland-Hassan and A. Vicente, eds., 53–77. Oxford: Oxford University Press.
5. Gauker, C. 2020. On the difference between realistic and fantastic imagining, *Erkenntnis*, early view.
6. Langland-Hassan, P. Gauker, C., Richardson, M. J., Dietz, A. & Faries, F., 2017. Metacognitive deficits in categorization tasks in a population with impaired inner speech, *Acta Psychologica*, 118, 62–74.
7. Kompa, N. 2019. Language and embodiment – or the cognitive benefits of abstract representations. *Mind & Language* (early view). In print 2021 (vol. 36, 27–47).
8. Kompa, N. and Mueller, J. 2020. How abstract (non-embodied) linguistic representations augment cognitive control, *Frontiers in Psychology* 11,1597.

9. Kompa, N. 2021. What good is language? Vygotsky on the Cognitive Benefits of (Inner and Private) Speech. In *Analytical Explications & Interventions*, Johannes Brandl, Beatrice Kobow & Daniel Messelken, eds., 37-149. Paderborn: Mentis/Brill.
10. Kompa, N. and Mueller, J. L. 2022: Inner speech as a cognitive tool—or what is the point of talking to oneself? *Philosophical Psychology*. DOI: 10.1080/09515089.2022.2112164
11. Kompa, N. 2023. Inner Speech and 'Pure' Thought - Do we think in language? Review of Philosophy and Psychology (online first). <https://doi.org/10.1007/s13164-023-00678-w>.

2 Objectives, cooperation, and research questions

2.1 Objectives

The hypothesis guiding our research is that spoken language is itself the medium of propositional thought. But we also assume that the central function of spoken language is to be a tool of communication — paradigmatically, communication between two or more people. Taken together these two assumptions challenge us to conceive of communication as something that can take place within a single mind.

This challenge can be looked at from two angles. From the point of view of thought, we can ask how thinking can be conceived as kind of communication of the self with itself. Crudely put, the question is: What could I tell myself that I do not already know? Answering this question will involve re-conceiving some of the tasks of cognition as processes of *intrapersonal* communication. In doing so, we will take advantage of the insights of other authors regarding the cognitive functions of language in executive control, memory and metacognition, and further examine the role of inner speech in deliberation and action. But we will also argue that inner speaking can play a role in sorting, comparing and generalizing from perceptual experiences in a way that resembles the role of conversation in interpersonal communication.

From the point of view of language, we can ask how to conceive of interpersonal communication so that it makes sense to think of propositional thought as an internalized form of conversation in the languages we speak. Much of the philosophical literature on language in the tradition of Grice (1975) assumes that communication is a matter of interlocutors' using the cues present in speech to infer one another's underlying thoughts (Bennett 1976; Sperber and Wilson 1986). This conception of communication has also been highly influential in developmental psychology (Tomasello 2008, 2019). But such a conception of communication stands in the way of treating spoken language as the very medium of propositional thought (because we would then have to posit a second layer of thoughts standing behind the thoughts for which language was the medium). So an element of the project will be to show that simple acts of interpersonal communication do not depend on interlocutors' thinking about one another's thoughts. We acknowledge that once people have acquired the ability to use language internally, then it becomes possible to engage in a kind of linguistic communication with them that involves making assumptions about their stream of unspoken thoughts. A further question, then, is how this second level of communication rests on the more basic level.

Since, according to our hypothesis, spoken language is the very medium of propositional thought, we have to suppose that there are kinds of thought other than the propositional. These will be the kinds that are employed by children when they are learning a first language, and they will be employed in deciding what to say to others and in deciding how to respond to what is said to us. Here we will be especially concerned to differentiate between the kinds of tasks that can be achieved by propositional thinking and the kinds that can be achieved by other kinds of thinking. One kind that will be the focus of attention is *imagistic* thinking — thinking in mental images. Imagistic cognition is better suited than thinking in language to solving problems that depend on a recognition of finely graded properties, such as length and curvature (Beck 2015),

and geometrical arrangements. Moreover, we may have a capacity to compare perceptually represented objects for relative similarity to one another, and this capacity may play a fundamental role in word choice and in decision-making in response to verbal inputs.

A final collection of issues can be grouped together under the heading *the realization of inner speech*. Nothing we have said above presupposes that all inner speech is accompanied by the sound of an inner voice or is in any sense conscious. But inner speech is often accompanied by auditory imagery of an inner voice, and many published discussions of inner speech identify inner speech with this auditory imagery (Martínez-Manrique and Vicente 2015, Langland-Hassan 2018, Geva 2018, Vicente and Jorba 2019). On our conception of inner speech as the medium of propositional thought, there has to be much more inner speech than that which is accompanied by auditory imagery. But this fact opens up several difficult questions. First, what arguments can be adduced for the notion that there are unconscious (not introspectively experienced) episodes of inner speech? Second, there seem to be some conceptual impediments that stand in the way of thinking of inner speech, and more generally, all forms of imagination as sometimes unconscious (Nanay 2021). Third, in some cases, certainly, inner speech is accompanied by auditory imagery and we would like to know what is special about those cases. Fourth, if inner speech is not constitutively bound up with the auditory imagery of speech, one must ask what aspects of speech it is constitutively bound up with. Do the words in inner speech have to be populated with phonemic representations? How much of the grammar of the language we speak has to be preserved in utterances in inner speech?

2.2 Cooperation between the two groups

Gauker, Kompa and their teams will address the same broad topics but will have different foci. The projects are meant to be complementary. Experience shows that a research group functions best when the number of participants is at least four or five. This ensures that there are enough people bringing new issues and new ideas to the regular meetings of the whole group. Now that video-conferencing has become a standard tool in academic life, we know that we can hold monthly meetings to discuss one another's research, invite discussions with outside researchers, and discuss recent publications. The two teams will work together in organizing the two planned workshops. Team members will look for opportunities to produce joint publications.

2.3 Research questions

Gauker proposes to focus his project-relevant research on two main themes.

1. *Communication without mind-reading*
2. *The percept-concept interface*

Kompa and her team will mostly focus on three main questions:

1. *How do we model dialogic inner speech and what cognitive functions might it fulfill?*
2. *How can there be (meaningful) inner speech with no antecedent propositional thought?*
3. *Is there (or can there be) unconscious inner speech and what cognitive role could it play?*

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