Formal vs Functional Linguistic Competence

- „Give language models a break!“: given a strict separation of linguistic and non-linguistic capabilities in the human mind, we should evaluate these capabilities separately [6]
  - Counter-argument: individuals with aphasia can be tested for their non-linguistic cognitive abilities (e.g. composing music), LLMs not [7]
- LLMs and the human *language network* exhibit non-trivial similarities [6]
  - LLMs learning features like POS, NER, and semantic roles at various layers [6]
- => Opinion: it might be beneficial to not try to train LLMs for functional abilities but rather *augment* LLMs with specific modules since „language and formal reasoning are distinct cognitive capacities that work best when they are supported by separate processing mechanisms“ [6]

However, since the language inputs contain wealth of information about the world, and language is „a crucial data source … for much of people’s world knowledge“, LLMs can still gain functional linguistic competence [6]

Functional Linguistic Competence of LLMs

- A prominent point of view on the human intelligence says that humans model the world in concepts. Thus for a „real“ understanding of the human language, a system (be it a human or an LLM) should map language inputs to concepts and manipulate those
- It is argued that embodiment and ability to couple form and reference are essential to acquire such concepts
- Moreover, for a proper understanding of other human beings via language, we should model which concepts they do have in their minds (theory of mind)
- However, LLMs have no mental models of the world [1], and the generated text is not grounded on any model of the reader’s state of mind [5]
  - => Opinion: since LLMs are not able to build conceptual models, they cannot infer meaning from the text; humans may believe LLMs „really“ understand what they generate only because of the human tendency to attribute meaning to things whether it is there or not; *coherence is in the eye of the beholder* [5]

However, if we consider this argumentation, it stands on a shaky ground