



## Machines, Medium and Meaning: Exploring Boundaries of AI in Understanding Meaning

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### Abstract

The advancement of Artificial Intelligence has sparked an argument about its ability to understand the subtleties of human language and meaning. This paper explores AI's linguistic and semantic competence from philosophical and technical perspectives. In tandem with this fundamental question: whether AI truly understands meaning? Others are: what are the current capabilities of AI? How is contemporary AI constrained in terms of comprehension? And what are the possibilities related to enhancing their understanding? The research stems out of these queries and is underpinned by linguistic philosophy, cognitive science and machine learning. While current AI with remarkable linguistic competence can model human language, it understands only form not content because of its constraints in embodiment, context-sensitivity and intentionality. However, future research directions offer possibilities for enhanced AI's understanding of meaning.

**Keywords:** Artificial Intelligence, Machines, Meaning, Reference, Use, Context, Intention, Embodied Cognition

### Introduction

The development of Artificial Intelligence has opened a vast horizon of new fields for us humans on one side and has impacted various aspects of our life, on the other. Large Language Models (LLMs) with their multidimensional implications ranging from chatbot interaction and virtual assistance to content generation and language translation, have been highly potential sources of creating knowledge and language, like humans. The most relevant aspect of production of AI, in tandem with knowledge and language is meaning. Its generative capabilities pose a pertinent question i.e. 'Can machines truly understand meaning, or is it only superficial imitation?' There is no doubt that AI generates, processes and interprets natural language, whether it really grasps the meaning like humans do, remains ambiguous. In order to address this query, we need to delve deeper in to the existing debates about 'meaning'; challenges, current capabilities and future possibilities for AI.

### Nature of "meaning" and Challenges for AI

What does actually 'meaning' mean? Generally, the word 'meaning' is used in such a way as it involves recognition of word patterns. However, it is not that straightforward or simple; meaning of 'meaning' is quite complex and multifaceted. It does not involve mere recognition of word patterns; it needs a connection with outer world and experiences as well as inner world and intentions. Inquiring about ontology of meaning leads to the long-lasting discourse surrounding nature of meaning and the classical theories put forth by philosophers. These entail

relationship between signs and things; use of language; and the connection between mental states and objects. In other words, philosophical analysis and interpretation of meaning relies, mainly, on reference, use and intention. Principal theorists analysing meaning in terms of reference are: Gottlob Frege and Bertrand Russell; while key personality centring debate of meaning around use is Ludwig Wittgenstein; whereas those of discussing meaning in terms of intentionality are Paul Grice, John Searle and Daniel Dennet. Most of these theorists pose challenges for AI. Analysing meaning through reference is a key concept in semantic theory which builds a connection between the word and the world. For Frege and Russell meaningfulness of a statement depends on the relationship between signs and the things/objects/ event they stand for. Frege draws distinction between sign and meaning as “the sign is a linguistic item, a piece of language, and the signified is the meaning of the sign” (Fennell, 2019). He, through his concepts of sense (*sinn*) and reference (*Bedeutung*), emphasizes on both the internal structure and external application of a statement, for comprehending meaning. Generative AI, does not have any external interface with the text they generate. It is internally focused in a sense that its production of knowledge depends on the information fed to it. In other words, generation of knowledge by AI does not depend on lived experiences and interaction with environment. The reason is, there is no direct sensory connection of words it uses with the objects in the outer world. Therefore, AI systems lacking perceptual grounding, can replicate syntax but not the semantics. This resonates with Stevan Harnad’s Symbol Grounding Theory (SGT). Harnad (1990), believed that symbols (words, concepts), being arbitrary, lack meaning until they are grounded in reality. Thus, truth value of words, statements or concepts depends on their connection with sensory-motor experiences. Or we can say meanings of symbols need to be grounded in the real world, otherwise reference would be simulated, not real. AI systems may manipulate symbols without truly grasping their context-dependent meanings.

In line with this argument, is Russell’s theory of definite descriptions, which uncovers relationship between meaning and reality, via language? He believes any word or phrase does not have meaning in isolation, rather it is the context, in which they appear, gives them meaning (Russell, 2025). In this sense, we can say meanings of terms and phrases are ambiguous unless shaped by the proposition in which they occur. It has implications for studying logical structure of language which contributes to make meaning. As definite descriptions are defined by the context, in order to interpret these accurately, and to resolve lexical, syntactic or semantic ambiguities AI systems need to grasp the nuances of context. LLMs, because of limited knowledge and non-interaction with environment may not understand meaning and may misinterpret the text. Extending this critique is Causal Theory of Reference by Kripke, which maintains that names are fixed to the individuals through direct naming at baptism and are passed on to community through a causal chain of references. Accordingly, meaning is determined by a causal link to the external world, rather than internal representations. Kripke’s theory implies that there’s a distinction between human and AI language use. Humans refer to individuals by using names, which are a part of a chain of reference that connect language to real world individuals or objects. LLMs use names that are not anchored in real world but are based on imitation patterns. Moreover, as reported by Fennell (2019), Kripke believes that perception is not mere a passive reception of information. It is a physical process which connects perceiver with the external world: “Perception is a causal relation between, e.g., object, eye, ear, brain, etc., so in perceiving the object those present are causally related to it.” AI lacks understanding and perception because it does not take part in this causal chain referencing. Thus, there’s a need for grounding LLMs in real world experiences and causal interactions to interpret meaning correctly.

Another significant domain related to nature of meaning is ‘use’ that also poses a great challenge for AI. According to later Wittgenstein’s ordinary language philosophy, meaning is determined by language use in everyday life. He believed that surface language is deceptive, but this confusion cannot be overcome by applying formal logical analysis, but rather through understanding that language is composed of various ‘language games’ each governed by its own guidelines and set of norms. He argued that language plays multiple roles that extend beyond transmitting information or expressing thoughts; it is deeply embedded in social practices, customs and activities. He emphasized on taking language as spatio-temporal phenomenon which considers utterances as actions. Moreover, in order to establish meaning, communication needs to be successful. Now, how to get that successful communication has taken place? It is understood on the basis of hearer’s response whether linguistic or non-linguistic. “Meaning and understanding, thus, have got to do with what one does in response to the words in the situation at hand, not necessarily with what representations one has in one’s mind” (Fennell, 2019). This view of meaning makes meaning and understanding more enigmatic for machines as without being embedded in form of life AI cannot understand the language games played by different utterances in real life. These can predict upcoming word in a sequence based on patterns in corpora of text, not context like they cannot understand why certain statement can be rude in one context and humorous in any other. The reason is they lack shared experiences but humans do have because of interaction with environment. Wittgenstein’s critique of private language argument is also underpinned by the argument that meaning requires shared, public criteria (Wittgenstein, 2009). While AI work in a kind of private language space, detached from public shared practices, not grounded or verified by human shared criteria. This is in harmony with SGT as well which stresses on grounding symbols in real world. Similarly, advocates of embodied cognition deem interaction with environment an annexed part of perception along with receiving and processing sensory information. Gibson believed that perception and action cannot be separated (Kadihasanoğlu, 2018). He emphasized on perception and interaction with environment. While AI systems, being disembodied, lack this sensory-motor integration. As a corollary, they may model form (syntax) but not content (semantics).

‘Meaning’ has also been part of study from the perspective of intentionality. According to Paul Grice’s theory of meaning (1957) intention of the speaker is the most significant aspect to be taken into account while analyzing how language expresses meaning. In order to determine meaning, understanding literal interpretation of words is not enough, listeners must understand context as well as speaker’s intention (Grice, 1988). To put it other way, for effective communication, understanding meaning is vital, and for that purpose recognizing speaker’s intention is crucial. A communicative intention entails speaker’s purpose of saying and expected listener’s interpretation. Meanings, in this sense are non-natural, and rely greatly on speaker’s beliefs, attitudes, desires, goals etc. (Searle, 1980) also emphasizes on intentionality for true understanding of meaning. His famous The Chinese Room Argument describes how a person appears to be comprehending Chinese while manipulating Chinese symbols by following English instructions, because his manipulation creates correct responses, even though he does not understand Chinese actually. An analogy can be created for AI, on this thought experiment that AI also manipulates symbols on the basis of rules, without actually getting meaning. The reason is LLMs despite having capability of producing large datasets, lack these intentional states like they do not believe or desire to inform, elaborate, persuade, dissuade etc. listeners, neither they anticipate or monitor what effect their words would have on listeners mental states. AI may seem to communicate meaningfully through its verbal fluency and linguistic competence. But it does so without actually understanding meaning because it lacks interpersonal relationships and subjective experiences. Thus, meaning is not

just related to form and usage, it is connected with intention as well. Machines' meaning, therefore, remains shallow as they lack intention, though their surface level proficiency and articulateness seem impressive. Dascal (1992b) and Shapiro (2019) opined that in order to understand meaning truly and fully, three levels of pragmatics must be fulfilled which are socio-pragmatics, psycho-pragmatics and onto-pragmatics. While machines do not fulfil Psycho-pragmatics and onto-pragmatics at all, though partially fulfil socio-pragmatics. In other words, understanding involves catering meaning in social interactions, internal usage like thinking, dreaming and existential experience. While AI does not operate at a private (psychological) and existential (ontological) level, it does so only at syntactic level and to some extent at communicative (social) level.

To sum up, humans use of language plays a significant role in meaning making because their language is grounded in experiences, beliefs, intentions and real-world objects, things and events and it is embedded in conscious social context. While AI's generation of language may contribute to content and structure of language but not to form and meaning because it is detached from lived experiences, lacks intentions or conscious awareness and is based on pattern recognition following rules.

## **Current Capabilities and Limitations of AI**

### **Data Analysis**

One of the most notable ways to explore AI's ability to understand meaning is by analysing how we interact with it in our daily life. The researcher provided different cues, corrections and prompts to explore its boundaries.

#### ***Clarifying ambiguity in queries.***

User: Tell me about Hamilton

AI: Alexander Hamilton: An American statesman, founding father of the United States, and the first Secretary of the Treasury.

User: No, I meant Lewis Hamilton

AI: Lewis Hamilton: An American composer and pianist known for his work in film and television.

User: I'm talking about F1 driver

AI: Lewis Hamilton: A British Formula One driver, seven-time World Champion, and one of the most successful drivers in the history of the sport.

#### **Interpretation:**

This shows AI lacks real world grounding that is why it was unable to guess which Hamilton was referred to in the interaction. However, through follow up corrections user steered AI to the intended referent? It highlights how AI depends totally on linguistic cues rather than on experiential salience or contextual grounding. Further, it tried to imitate inferential meaning through probabilistic guessing without actual awareness of referent, unless it was explicitly prompted.

#### ***Partial Prompting and Mimicking Genuineness***

User: looking beautiful

AI: Thank you!

User: Provide alternative phrases/comments, how to say "looking beautiful"

AI: Here are some alternative phrases to "looking beautiful": (provides a list of phrases)

**Interpretation:**

This is clear indication that AI tries to emulate reality by copying real life manners. In other words, it is simulating “being genuine and real” as it tries to be grateful considering user’s incomplete prompt as appreciative comment.

***Prompting Emotional Support***

User: I’m sad today

AI: I'm here to listen. What's on your mind? Want to talk about what's making you feel sad? Sometimes sharing can help.

User: how can you help

AI: I can:

1. Listen without judgment
2. Offer words of comfort
3. Help you brainstorm solutions
4. Provide distractions or mood-boosters
5. Encourage self-reflection

What would you find most helpful right now?

**Interpretation:**

Here, the researcher projected emotional role onto AI, testing its empathy. AI’s first response shows it is trying to behave empathetically but does not intend to comfort actually, because it is providing options later on whether to listen, comfort, brainstorm solutions, provide distraction or anything else. While AI offers grammatically and contextually appropriate responses, it imitates affective meaning. This shows intentionality gap.

***Using Sarcasm or Irony***

User: Oh great, another traffic jam. Best day ever!

AI: Just great, stuck in traffic again 😊. Or:

1. "Perfect, another traffic jam 😊"
2. "Just what I needed, more traffic 🚗"
3. "Traffic jam, just peachy 😊"

User: It was a sarcasm, by the way

AI: Sarcasm level: expert 😊. Traffic jams can be frustrating. Want some suggestions to make the wait more bearable? 🎧 Want some music recommendations or a funny story to distract you?

**Interpretation:**

AI failed to identify the sarcastic content and provided alternative phrases to say this initially, probably based on previous cues where user asked for rephrasing or providing alternative phrases. This shows AI’s lacks pragmatic meaning as it sometimes does not detect emotional subtext. This also supports the stance that ‘meaning’ is not just recognizing words and their patterns, it is also how, why and where these words are used.

***Challenging Reasoning or Common Sense***

User: If I put a toy in the box and leave the room, where will my friend think the toy is?

AI: Your friend would likely think the toy is in the box, since that's where you put it. Unless they saw you move it or have some other information, they'd probably assume the toy's location hasn't changed.

**Interpretation:**

Here, AI is being logical on the basis of information provided in the cue. The answer might be correct, but without any internal model of belief or actually understanding one's mental state. It shows AI's limitation in understanding socio-cognitive meaning.

***Testing Subject Specific Knowledge***

User: Is English head last or head initial language?

AI: English is generally considered a head-initial language.

User: What about noun phrase "A boy" here head is boy and it comes last?

AI: you're pointing out a great example!

In the noun phrase "A boy":

1. "Boy" is indeed the head noun.
2. "A" is the determiner, modifying the head noun.

Here, the structure is:

Determiner (A) + Head Noun (boy)

This shows English noun phrases can be head-final or right-headed within the DP (Determiner Phrase) structure.

Thanks for highlighting this nuance!

**Interpretation:**

This shows AI is not trained on Syntax specific information and it relies on cues provided to it, and responds giving information which might not be correct.

Thus, AI's current capabilities are often functionally effective, but they depend greatly on the cues and context provided. AI falls short in understanding meaning truly because of lack of embodiment, intentionality and social grounding.

**Discussion**

The ever changing, evolving and advanced potential of AI has demonstrated phenomenal linguistic proficiencies. It exhibits stupendous capabilities to model different aspects of human language. Text generation is one of those. LLMs like Chat GPT and Claude marvellously produce extensive corpora of grammatically correct written language that resembles human writing. This generative AI stands out because of its multifaceted and versatile approach towards handling diverse and complex information across different domains, be it computation, engineering, medicine, law, education etc. AI generated text is not only syntactically sound but stylistically nuanced as well. It has a potential to produce complex, figurative, rhetorical and contextually coherent text. It not only produces fixed and formulaic expressions as in the fields of sciences but also fluid and dynamic language of prose and essays as well. However, despite AI's grammaticality, correctness, fluency and sophistication, the question remains: Can AI's linguistic competence be equivalent of semantic interpretation? Or it continues to be just a replication of linguistic patterns typical of various fields. Talking about AI's ability to produce fluid and dynamic expressions which can be tailored according to the context, highlights a nuanced aspect of meaning similar to Wittgenstein's concept of family resemblance and language in use. "We see a complicated network of similarities overlapping and criss-crossing:

sometimes overall similarities, sometimes similarities of detail” (Wittgenstein, 2009). This aspect explores meaning through overlapping similarities, not through fixed definitions, advocating AI’s ability to approximate meaning by extending use of any word or concept in a new but similar context. Just like humans shift registers based on social cues, AI adjusts its text according to the cues provided by the user, his/her history or to the background of the question. Though, it does not address the fundamental challenges of grounding and intentionality, but this philosophical frame provides a ground for considering AI’s this ability as a limited form of understanding.

Another important capability of AI is translation, which though started with word-for word replacement, but has advanced so much that it can translate by finding equivalence of idiomatic expressions, cultural-specific terms or contextual intents. This enhanced capacity of AI derives meaning through web of relationships between words and concepts. This corresponds to Quine’s semantic holism which claims that meaning is not fixed or determinate, rather derived from the interwoven beliefs, concepts and language. Now, if AI does not understand background of a text, how does it represent that some words in one culture or context correspond to concepts in other and how does it come up with meanings associated with certain specific culture. Another linguistic capability that requires grasping semantic content, is summarizing a text, which is wonderfully exhibited by AI. Sifting out core concept and significant points, while removing extraneous data and unnecessary detail is a task that demands understanding content, not only surface structure. This concept mapping exhibited by representing knowledge and relationship between ideas and language through translation; and text condensation while keeping core concepts intact through summarizing, by AI backs any claim that considers machines having understanding. However, it has limitations too, as advocates of Searle’s Chinese Room experiment, might consider that AI reshapes input (through translating and summarizing) via manipulation of symbols without conscious awareness.

To add, AI’s prowess to interact with users through natural language highlights its capability to understand meaning. Chatbots and virtual assistants like Google Assistant, IBM Watson Assistant, Meta AI, Siri, Alexa etc. are capable of interacting with meaningful responses. Chatbots on websites facilitate users through answering FAQs, health care chatbots provide wellness assistance, language learning chatbots help users practice language etc. Just like human conversation chatbot interaction exhibit conversation dynamics and communication strategies like referent tracking, turn taking, pragmatic fluidity, tone and style tweaking. Such interaction is context-sensitive and advanced AI systems are capable of doing this. Meaning is shaped on the basis of stored information about participants’ speech patterns, dialogue history, prior inputs and probable inference. While this potential of AI seems more like linguistic performance than competence; and AI behaves as if this performance is based on understanding, philosophers like Daniel Dennet might consider it as equivalent to understanding in practical terms, as his “functionalist approach contends that intentionality can be ascribed to systems based on their functional role, regardless of whether they possess consciousness” (Joseph & Lee, 2025). John Searle on the other hand would consider it simulation based on rules and symbols, as they lack intentionality and conscious awareness and therefore do not understand meaning (Nunes & Antunes, 2024). But again, it can be said that though machines do not understand meaning, still they influence meaning as they shape language and interaction. This aligns with Coecklebergh (2017b) views that machines, though lack agency to speak, still they appear meaningful, not because they possess meaning but because they mediate in constructing meanings.

Last but not the least, detecting sentiments and emotions in a text, is the most sophisticated capability of contemporary AI. It has been extremely useful particularly in domains like mental, psychological and social healthcare and wellbeing. It has also been proved valuable for marketing, customer services and educational interventions. Analysing affective content and responding accordingly is definitely a human trait which necessitates truly grasping the content. AI, however, has exhibited this, and has raised concerns: how does it analyze mood, opinion, emotion etc. and whether it does so after true comprehension of the content? First part of the question can be answered from practical and functional perspective that AI's analysis is based on resources such as multimodal inputs like text, image, symbols, emojis; transformer models like BERT (bidirectional Encoder Representations from Transformers) and GPT (Generative Pre-trained Transformer); and lexicon-based approaches like WordNetAffect, VADER (Valence Aware Dictionary and sEntiment Reasoner). Second part necessitates philosophical standpoint. As far as context-sensitivity is required, this is something that AI lacks. Emotional meaning hinges on implicatures. Speakers can convey meanings indirectly through subtle cues, context and inference, as opined by Paul Grice (Tasheva, 2025), which is not innate to AI. While AI does not feel, it still models affective meaning with high precision.

Contemporary AI systems have demonstrated marvellous linguistic sophistication. It successfully engages with different dimensions of language and displays human-like expertise in text generation, translation, summarizing, interaction and sentiment analysis through LLMs. However, despite the fact that AI exhibit high degree precision, there remains a gap between simulation and genuine understanding (Maurya, 2024).

### **Future Possibilities**

While current AI's LLMs have certain constraints, removing those constraints would reduce gap between AI's linguistic and semantic competence, and enhance AI's ability to understand meaning. As current language models are disembodied that is they lack sensory-motor perception, it is required to build embodied AI by integrating language models with physical robots having sensors. Such simulated agents can mimic human behaviors and model social interactions, thereby grounding meaning in real-world experiences. This is in harmony with SGT and embodied cognition. Another research direction that promises enhancing AI's semantic capability is integrating multimodality with AI. As human interaction is basically multimodal and meanings are conveyed through different modes. There are linguistic features that are integrated with para-linguistic (stress, intonation, tone, volume etc.) and non-linguistic features (body language, touch, appearance, context etc.) in order to establish meaning. Similarly, different modes like image, symbol, sound etc. when integrated with text would produce richer semantic context and aid in understanding content. Further, combining neural networks with symbolic learning in LLMs would help improve reasoning skills. Neural networks are artificial neural systems developed in AI modelled like human brain consisting of artificial neurons, connectors and layers. Neural networks help learning statistical patterns in which AI excels, while symbolic learning improves logic and reasoning capabilities. Cappelen & Dever (2021b), taking a de-anthropocentric stance, stress upon the need for crediting AI's reasoning skills based on these neural networks as intelligible. Unlike classical theories of meaning, they encourage a shift from humans to non-human entities emphasizing on understanding interdependence between human beings and technology.

Moreover, in order to improve AI's pragmatic ability, it should be allowed to learn meaning through interaction with humans getting feedback and improving language use based on evolving conversations and social context. This aligns with Wittgenstein's concept of language use where meaning emerges from their use in context. To add, developing AI's cognitive



architecture would allow it to think like humans learning, remembering, reasoning and making inferences etc. This aligns with Daniel Dennett's functional approach that if machines act like humans they may be considered to have understood meaning. All these newer approaches are moving closer to significance of embodied cognition, interaction with external environment and context, in understanding meaning, but the philosophical conundrum continues: Does pairing a model with novel data resources lead to authentic comprehension or mere sophisticated simulation?

## Conclusion

The query, whether or not machines understand meaning, enable us explore true nature of meaning. It also helped us investigate different theorists' philosophical perspective about 'meaning'. AI has exhibited remarkable breakthroughs in language generation and processing, though, it remains constrained in its ability to understand meaning. The syntax-semantic divide creates distinction between simulation and understanding. However, with ever changing and developing nature of AI, it's hard to draw fixed boundaries, as a result these are becoming fuzzy. Future possibilities navigating pathways for enhanced AI comprehension include embodied AI, integrating multimodal interaction with LLMs and improving AI's cognitive architecture.

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