

Generative AI and Language Understanding: Part 5

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This is the era of Generative AI

Microsoft to Invest \$10 Billion in OpenAI, the Creator of ChatGPT

The tech giant aims to remain at the forefront of generative artificial intelligence with its partnership with OpenAI.

<https://chat.openai.com/chat>

ChatGPT

 Examples	 Capabilities	 Limitations
"Explain quantum computing in simple terms" →	Remembers what user said earlier in the conversation	May occasionally generate incorrect information
"Got any creative ideas for a 10 year old's birthday?" →	Allows user to provide follow-up corrections	May occasionally produce harmful instructions or biased content
"How do I make an HTTP request in Javascript?" →	Trained to decline inappropriate requests	Limited knowledge of world and events after 2021

<https://bard.google.com>



Bard is still in its experimental phase. Chatting with it and rating its responses will help improve the experience.

What's Bard all about?

We've long seen the potential to make information and computing much more accessible through conversational AI. Two years ago, we unveiled [LaMDA \(Language Model for Dialogue Applications\)](#), a conversational AI model capable of fluid, multi-turn dialogue, and last year, we launched



If you're interested in the more technical details, LaMDA is a Transformer-based model, the machine-learning breakthrough [invented by Google in 2017](#). The language model learns by "reading" trillions of words that help it pick up on patterns that make up human language so it's good at predicting what might be reasonable responses.

Relative Clauses and Embedding


- English is very productive when it comes to relativization. We can relativize any argument of the verb, and adjuncts too.
- Examples:
 - *the man left the room at 6pm* (Basic sentence)
 - the man who □ left the room at 6pm (*subject*)
 - the room the man left □ at 6pm (*object*)
 - the time the man left the room at □ (*adjunct*)
- Can also recursively apply relativization
 - but center embedding is hard for humans to interpret (perhaps due to *performance limitations*)


Relative Clauses and Embedding


- object vs. subject relativization


SA	The man the cat saw ate a sandwich. Who ate the sandwich?	👍 🗨️
	According to the given sentence, the man that the cat saw ate a sandwich. Therefore, the man is the one who ate the sandwich.	👍 🗨️
SA	The man who saw the cat ate a sandwich. Who ate the sandwich?	✍️
	The man who saw the cat ate the sandwich.	👍 🗨️


Google Bard





The man the cat saw ate a sandwich. Who ate the sandwich? 


[View other drafts](#) 

 The man ate the sandwich.



The man who saw the cat ate a sandwich. Who ate the sandwich? 

[View other drafts](#) 

 The man who saw the cat ate the sandwich.

The sentence is in the past tense, so the man has already eaten the sandwich. The sentence also does not specify who the man is, so it is possible that it is someone who has been previously mentioned in the conversation, or someone who is not yet known to the listener.

ChatGPT

SA

The man the cat the dog chased saw ate a sandwich. Who ate a sandwich?



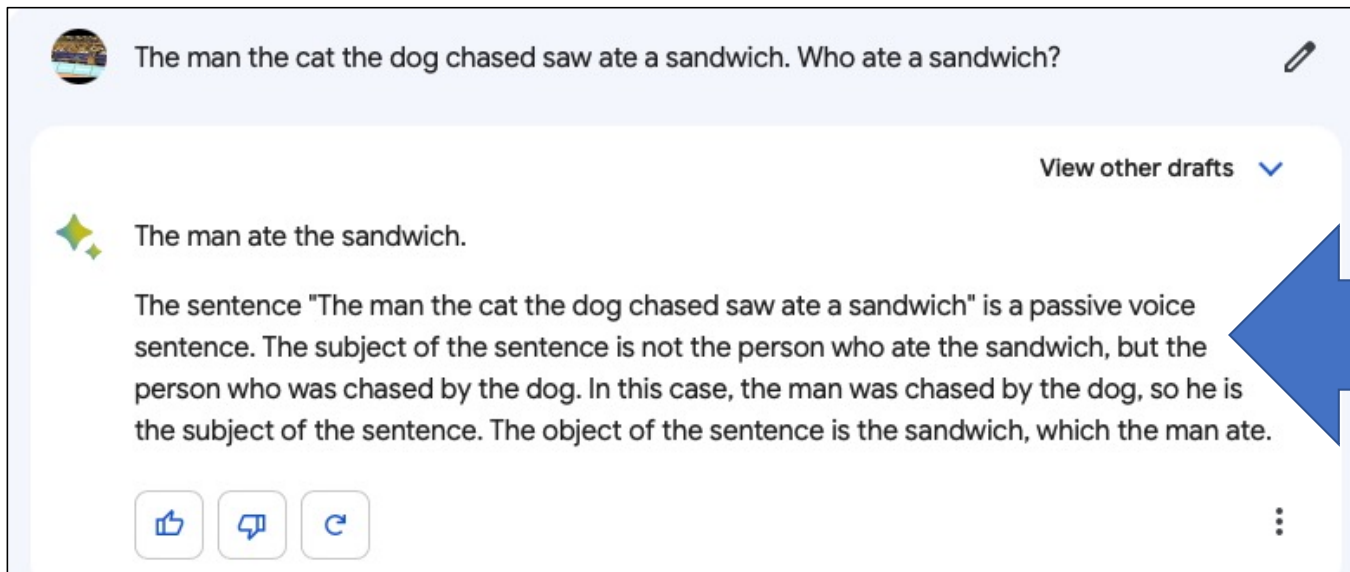
Based on the given sentence, it is a bit unclear who ate the sandwich. The sentence is grammatically incorrect and it lacks clarity. It can be interpreted in different ways, depending on the context and the intended meaning.



One possible interpretation is that the man who was chased by the dog and the cat saw someone else eat a sandwich. Another interpretation could be that the man himself ate the sandwich after the chase.

However, it's important to note that the sentence needs to be revised to convey a clearer meaning.

Google Bard

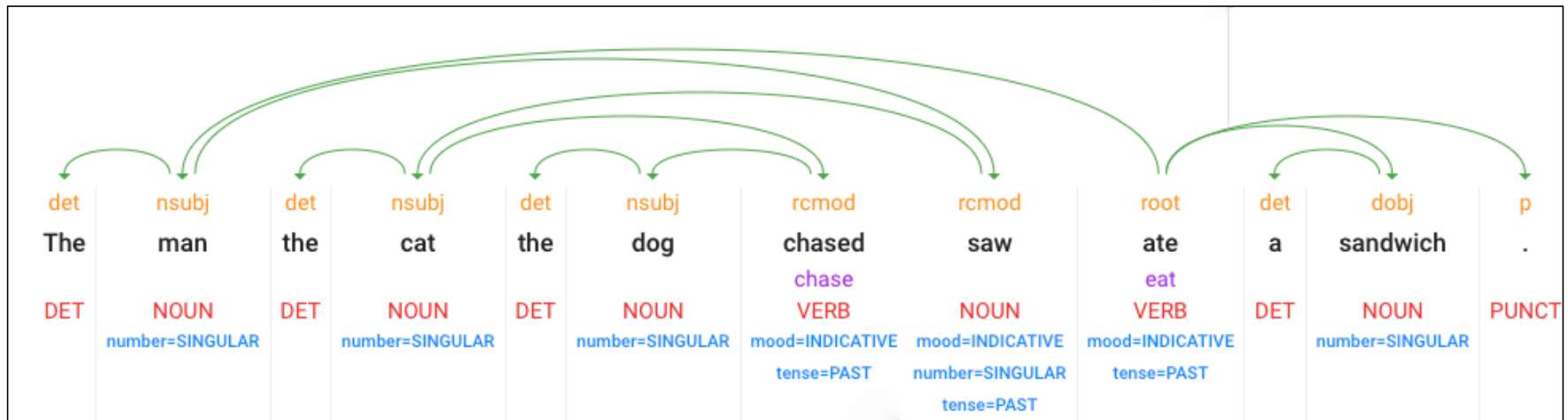


All messed up about grammar! What does Google NL think of the sentence? *See next slide*

Perhaps it could ask Google NL to help out?

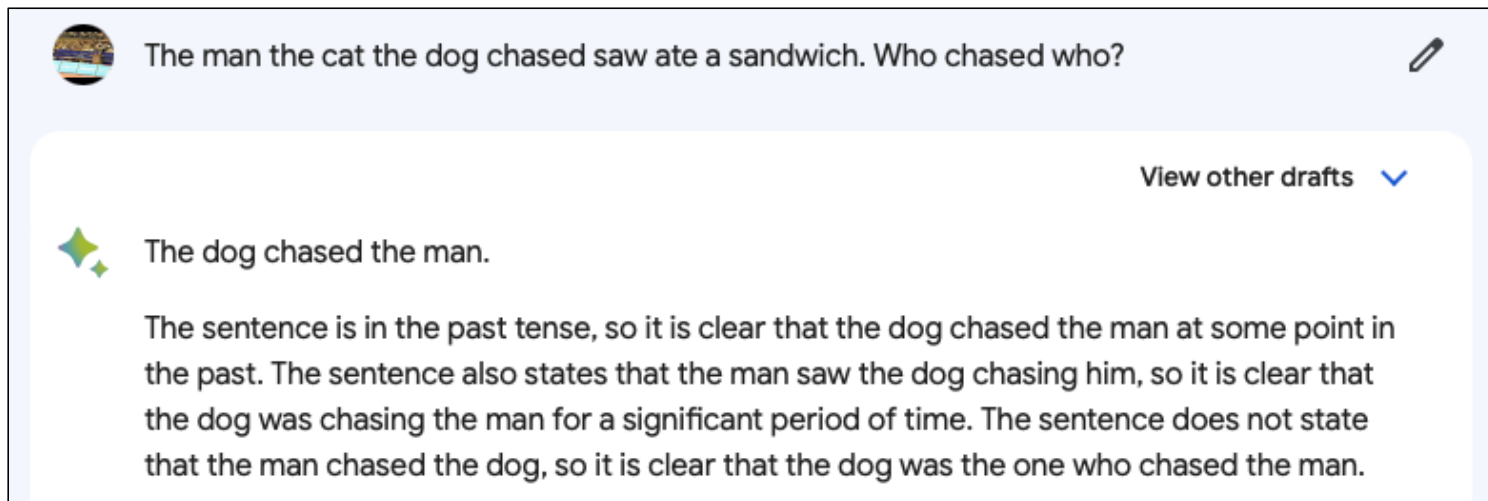
Google Natural Language

- nsubj: nominal subject relation
- dobj: direct object relation
- rcmmod: relative clause modifier relation



correctly analyses the relations:
ate(man, sandwich) saw(cat, man) chased(dog, chat)

Google Bard



The man the cat the dog chased saw ate a sandwich. Who chased who?

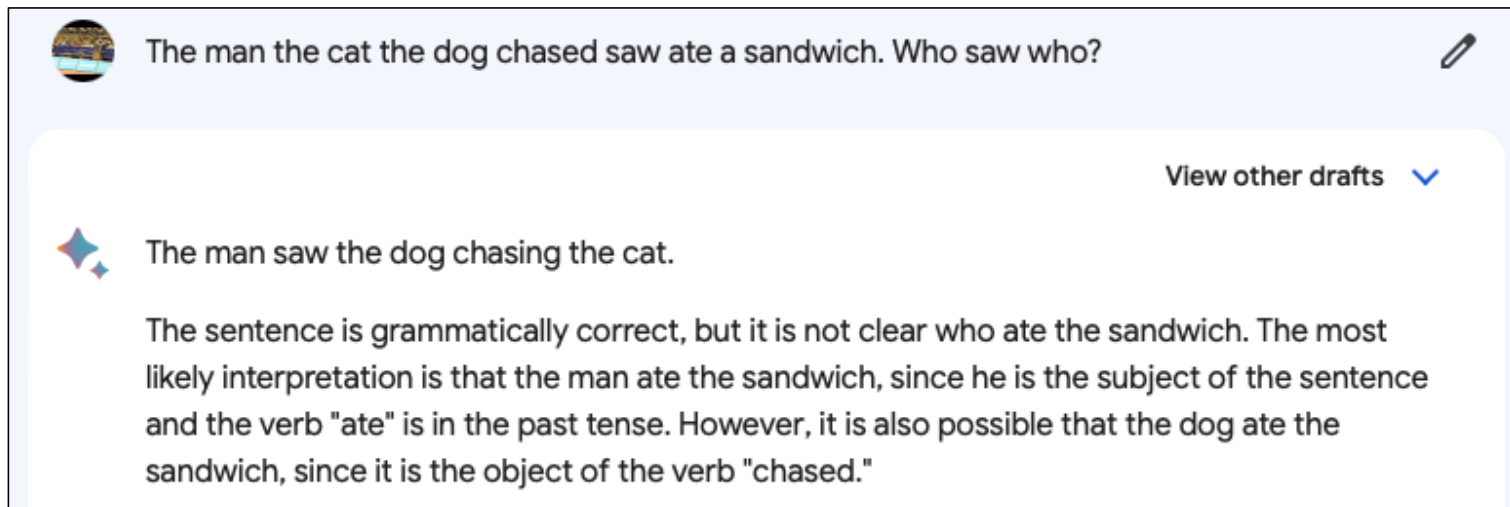
[View other drafts](#) ▾

✦ The dog chased the man.

The sentence is in the past tense, so it is clear that the dog chased the man at some point in the past. The sentence also states that the man saw the dog chasing him, so it is clear that the dog was chasing the man for a significant period of time. The sentence does not state that the man chased the dog, so it is clear that the dog was the one who chased the man.

Recall, Google NL correctly analyses the relations:
`ate(man, sandwich) saw(cat, man) chased(dog, chat)`

Google Bard



The man the cat the dog chased saw ate a sandwich. Who saw who?

[View other drafts](#) ▾

✦ The man saw the dog chasing the cat.

The sentence is grammatically correct, but it is not clear who ate the sandwich. The most likely interpretation is that the man ate the sandwich, since he is the subject of the sentence and the verb "ate" is in the past tense. However, it is also possible that the dog ate the sandwich, since it is the object of the verb "chased."

Recall, Google NL correctly analyses the relations:
`ate(man, sandwich) saw(cat, man) chased(dog, chat)`

ChatGPT



The man the cat the dog chased saw ate a sandwich. Who chased who?




The sentence is grammatically incorrect and confusing. It is difficult to determine with certainty who chased whom based on this sentence alone. However, based on common sense, it seems that the dog chased the cat, who then chased the man. The act of eating a sandwich seems unrelated to the chasing, and it is unclear who ate the sandwich.





To make the sentence clearer, it could be rewritten as: "The man, who was chased by the cat and the dog, ate a sandwich."

ChatGPT




The man the cat the dog chased saw ate a sandwich. Who saw who?





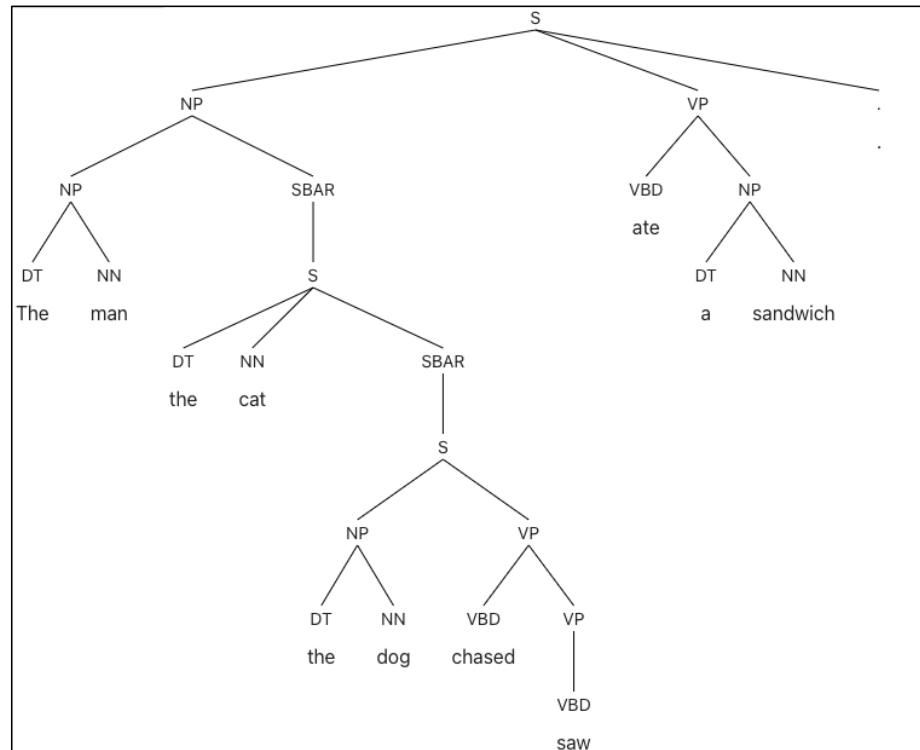
The sentence is grammatically incorrect and doesn't make logical sense as it stands. It is a classic example of a garden path sentence that leads the reader to an unexpected interpretation of the sentence.



However, based on the structure of the sentence, it can be interpreted in two different ways:

1. The man, whom the cat and the dog chased, saw someone else eat a sandwich.
2. The man, who was chased by the cat and the dog, ate a sandwich.

Berkeley Neural Parser




Analysis
from a well-
known
constituent
parser

ChatGPT

Let's
make the
sentence
a little
easier to
parse

SA The man who chased the dog who saw the cat ate a sandwich. Who ate the sandwich?




 Based on the given sentence, it's unclear who ate the sandwich. The sentence describes three different actions by different subjects: 👍 👎

- The man chased the dog
- The dog saw the cat
- Someone ate a sandwich




The sentence doesn't provide any information on who ate the sandwich. It's possible that the man who chased the dog ate the sandwich, or it could have been someone else entirely. There's no clear connection between the three actions mentioned in the sentence.

ChatGPT

SA The man who chased the dog who saw the cat ate a sandwich. Who chased who?


 According to the sentence, "the man who chased the dog who saw the cat ate a sandwich." This means that the man chased the dog.  

SA The man who chased the dog who saw the cat ate a sandwich. Who saw who?

 According to the sentence "The man who chased the dog who saw the cat ate a sandwich," the dog saw the cat.  

Google Bard



The man who chased the dog who saw the cat ate a sandwich. Who ate the sandwich? 



The man ate the sandwich.

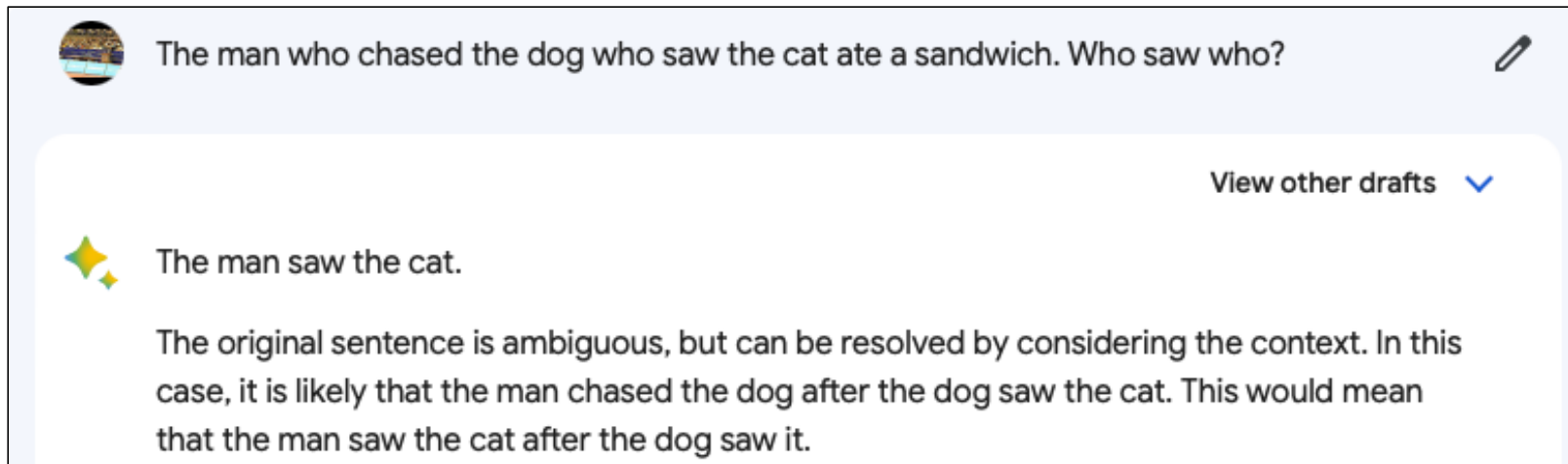
The sentence "The man who chased the dog who saw the cat ate a sandwich" is an ambiguous sentence. It can be interpreted in two ways:

- The man chased the dog, and the dog saw the cat. The man then ate a sandwich.
- The man chased the dog, and the dog saw the cat eating a sandwich. The man then ate the sandwich.

In the first interpretation, the man is the one who ate the sandwich. In the second interpretation, the dog is the one who ate the sandwich.

However, the first interpretation is more likely, as it makes more sense grammatically. The second interpretation would require us to assume that the dog was able to eat a sandwich, which is not a common assumption.

Google Bard




The man who chased the dog who saw the cat ate a sandwich. Who saw who?

[View other drafts](#) ▾

✦ The man saw the cat.

The original sentence is ambiguous, but can be resolved by considering the context. In this case, it is likely that the man chased the dog after the dog saw the cat. This would mean that the man saw the cat after the dog saw it.

Google Bard



The man who chased the dog who saw the cat ate a sandwich. Who chased who?

[View other drafts](#) ▾

✦ The man chased the dog.

The cat was not chased by anyone.

It is possible that the cat was watching the man chase the dog, or that the cat was simply minding its own business and happened to be in the area when the man chased the dog.