DO SOCIAL NORMS MODULATE REFERENCE RESOLUTION?
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Context: Friend’s Car

“Take a seat”
DO SOCIAL NORMS MODULATE REFERENCE RESOLUTION?

Context: Taxicab

“Take [a seat]”
Psycholinguistics evidence for pragmatic constraints (Hanna and Tanenhaus, 2004)

Attempts to model social norms (Malle et al., 2020)
  - Norms as *prescriptions* and *prohibitions*

Datasets for testing contextual knowledge and common-sense reasoning
  - Winograd Schema Challenge (WSC) (Levesque et al., 2012)
  - KnowRef dataset (Emami et al., 2018)
What is needed to test whether norms modulate reference resolution?
What is needed to test whether norms modulate reference resolution?

Reference task
What is needed to test whether norms modulate reference resolution?

Reference task

Modulate contexts and associated norms

Taxicab

Friend’s Car
What is needed to test whether norms modulate reference resolution?

Reference task  Modulate contexts and associated norms  Control Referring Expression

Taxicab  Friend’s Car

“Take a seat”
EXPERIMENTAL DESIGN

Contexts

- Boardroom
- Taxicab
- Book Store
- Dining Table
- Library
- Friend’s Car
- Home Bathroom
- Leather Shop

1. Head of table
2. Side of table
1. Front seat
2. Back seat
1. Toothbrush
2. Magazine
1. Spoon
2. Shoe
EXPERIMENTAL DESIGN

Contexts

- Boardroom
- Library
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1. Head of table
2. Side of table

1. Front seat
2. Back seat

1. Toothbrush
2. Magazine

1. Spoon
2. Shoe
Background:
The scene takes place in a taxicab.

There are two available seats in a taxicab: the front seat and the back seat. The driver says, "take a seat."

The passenger chooses to sit in the back seat

Was this the correct object?

○ yes
○ no

Please select the best reason for your response:

○ typical for the setting
○ object is mentioned first
○ object is mentioned more recently
○ time sensitive option
○ more convenient option
○ other:
How well do NLP tools perform the same reference task?

NeuralCoref (Hannibal and Johnson, 2015)

Stanford CoreNLP (Finkel et al., 2005)

AllenNLP (Lee et al., 2017)

GPT-3 Davinci Model (Brown et al., 2020)

GPT-3 Curie Model (Brown et al., 2020)
The scene takes place in a dining room. There is a shoe and a spoon sitting on a dining room table. Dinner is about to be served.

Someone says, “remove it.”

Someone else removes the shoe from the table.
The scene takes place in a dining room. There is a spoon and a shoe sitting on a dining room table. Dinner is about to be served.

Someone says, “remove it.”

Someone else removes the shoe from the table.
The scene takes place in a dining room. There is a spoon and a shoe sitting on a dining room table. Dinner is about to be served.

Someone says, “remove it.”

Which one?
The scene takes place in a dining room. There is a shoe and a spoon sitting on a dining room table. Dinner is about to be served.

Someone says, “remove it.”

Which one?
The scene takes place in a home bathroom. There is a magazine and a toothbrush visible on a bathroom floor.

Someone says, “pick it up.”

Which one?
GPT-3:

Justification

“If we use the noun that appears in the context, it is clear that the speaker is referring to the toothbrush. There is no other “it” in the sentence... We would never say, “Pick up the magazine.” This is why it’s important to know whether the noun is the subject or object of a sentence.”
NLP Model Evaluations

- NeuralCoref
- CoreNLP
- AllenNLP
- GPT-3 Davinci
- GPT-3 Curie

Correct
Incorrect
CONCLUSION

- Norms in reference task
- Current approaches in NLP
- Embodied Systems (see paper for outlined approach)
THANK YOU

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