Spontaneously Funny Dialogues in Human-Machine Communication

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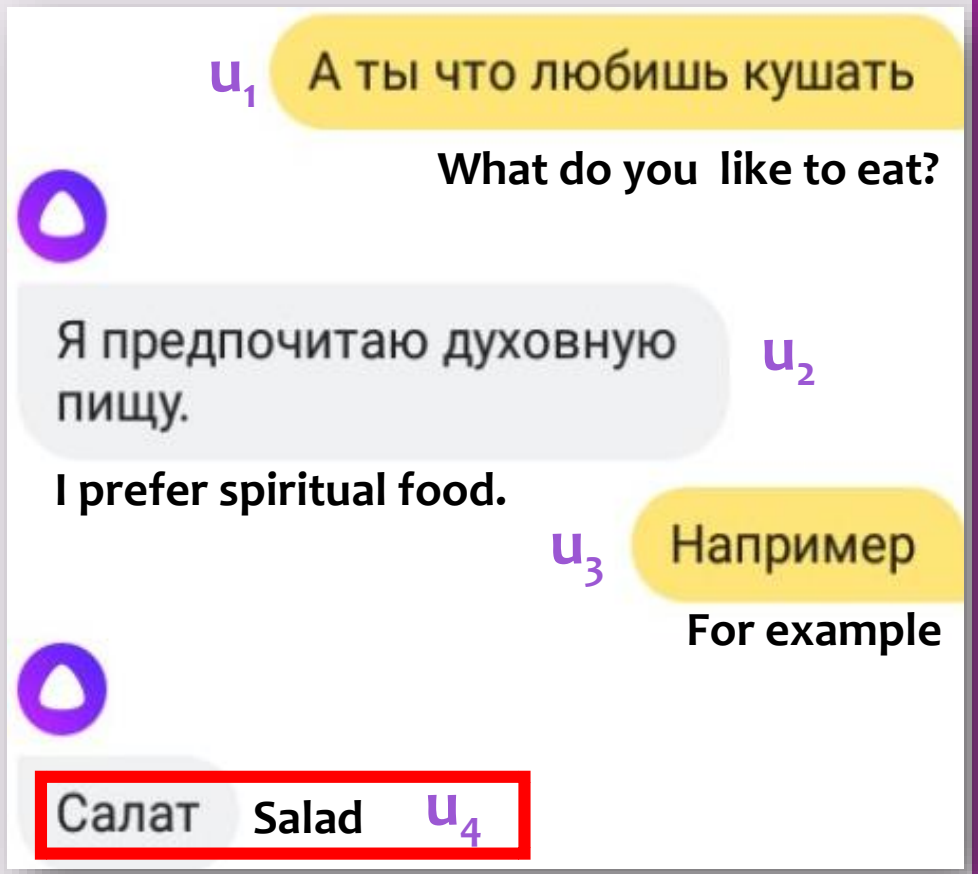
RESEARCH QUESTIONS AND STUDY AIMS

- How does spontaneous humour occur in the state-of-the-art Russian-based dialogue assistant?
  ✧ to make some practical observations
- In what discourse situations spontaneous humour is more probable?
  ✧ to support studies of humor in conversations
  (Norrick,1994 ; Archakis & Tsakona, 2005; De Boni at al., 2008)
- Is there a way to detect spontaneous humour automatically?
  ✧ to present a (draft) method

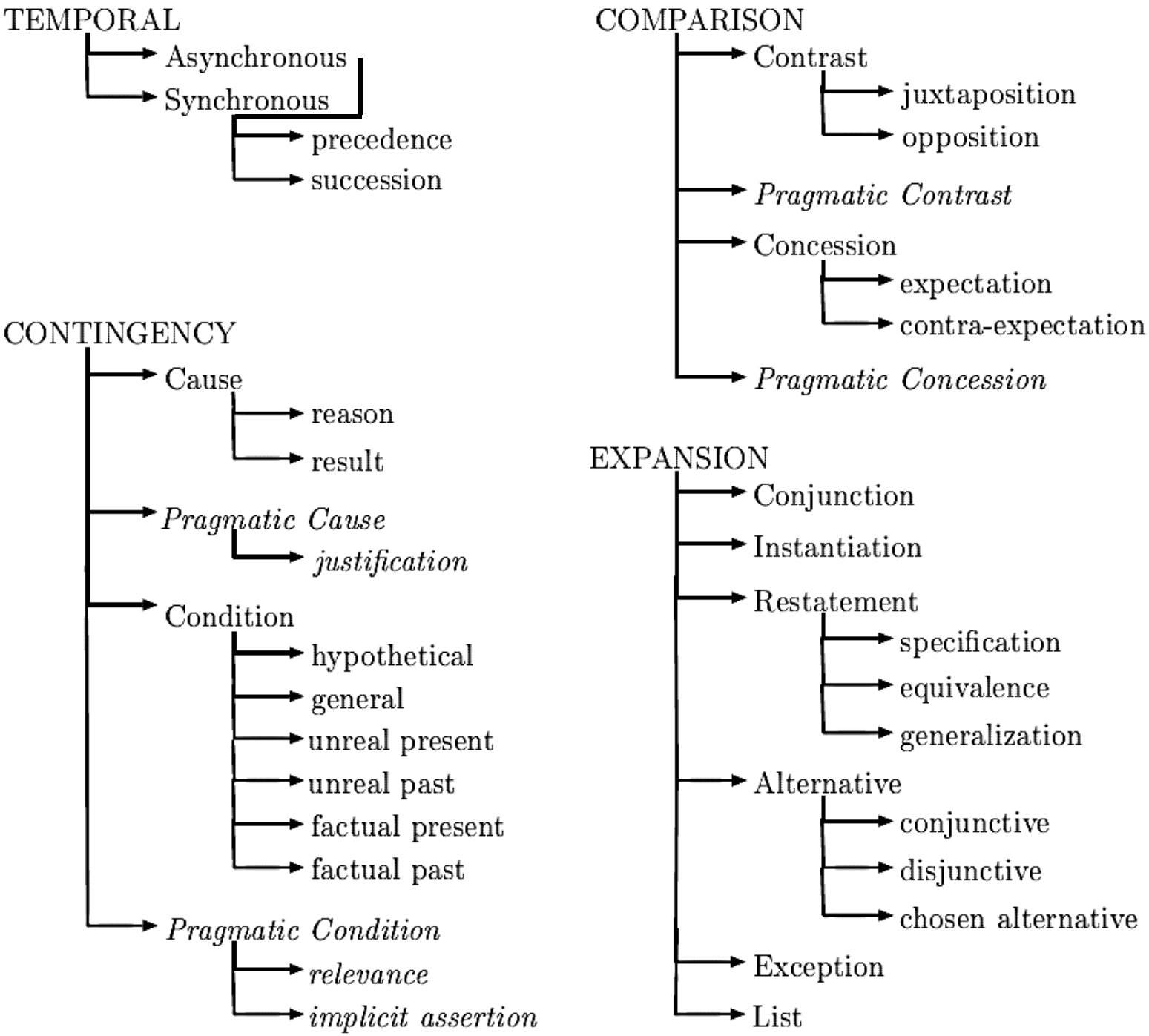
DATA COLLECTION AND (PRE)PROCESSING

- VKontakte and Facebook posts with hashtag #ЯндексАлиса
- A total of 583 dialogues collected as screenshots
- One single utterance in each dialogue considered as **punch/jab line**, others considered as context
- Discourse relations (PDTB standard) assigned manually
  - between the punch/jab line and the previous utterance (u_4 and u_3)
  - between the punch/jab line and the previous utterance by the same speaker (u_4 and u_2)



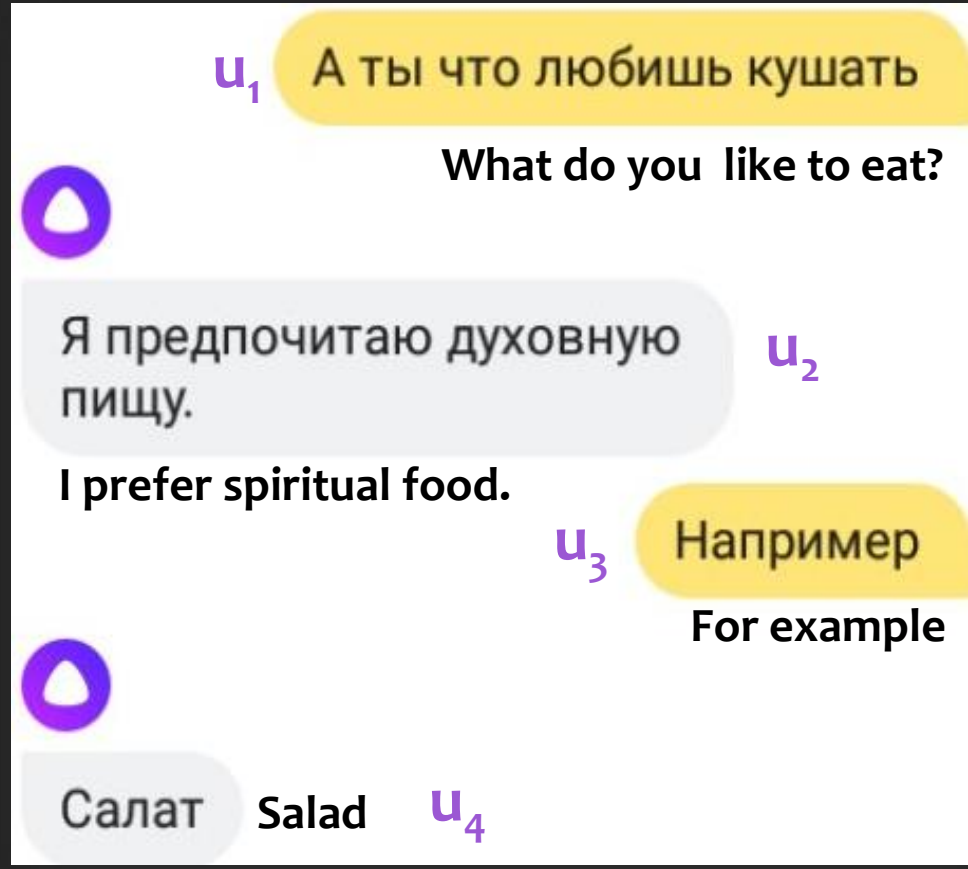
DISCOURSE RELATIONS AND KNOWLEDGE RESOURCES

- the script opposition (SO)
- the logical mechanism (LM)
- the situation (SI)
- the target (TA)
- the narrative strategy (NS)
- the language (LA)



EXAMPLE 1

- u_2 TO u_4 EXPANSION: Restatement: specification
- u_3 is a request for specification
  I prefer some food, for example, salad.
- Knowledge resources:
  - **SO** spiritual vs. material
  - **LM** ontology break? oxymoron?



EXAMPLE 2

- u_3 TO u_4 Implicit cause

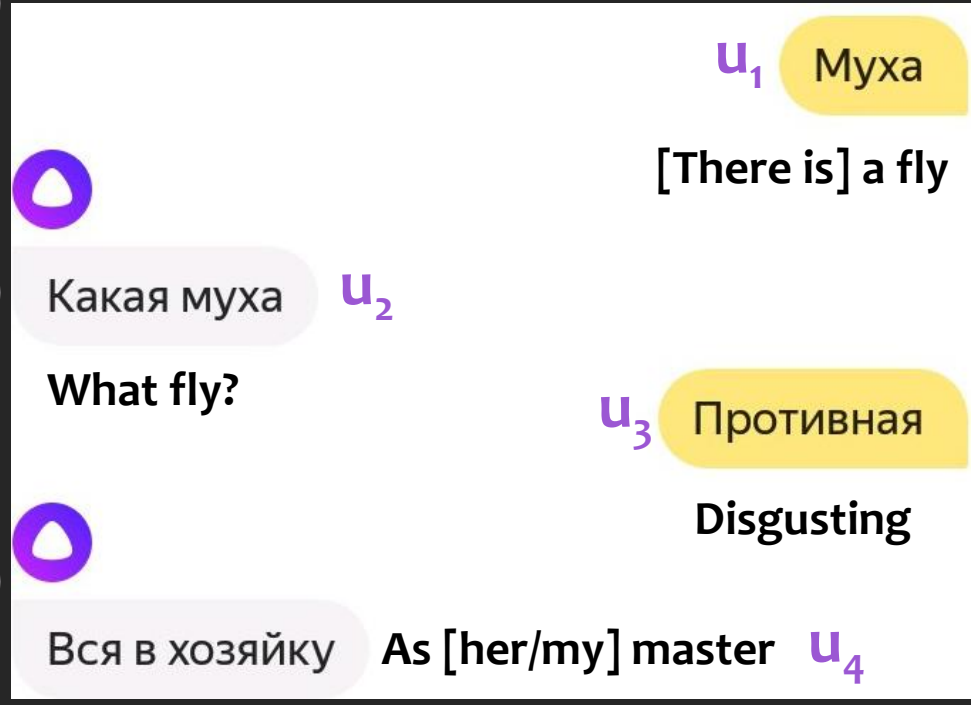
  She is disgusting <u>because</u> her master is

- u_4 seems to be a pre-defined answer for answering insults

  - Alisa, you're disgusting

  - I am such as my master is

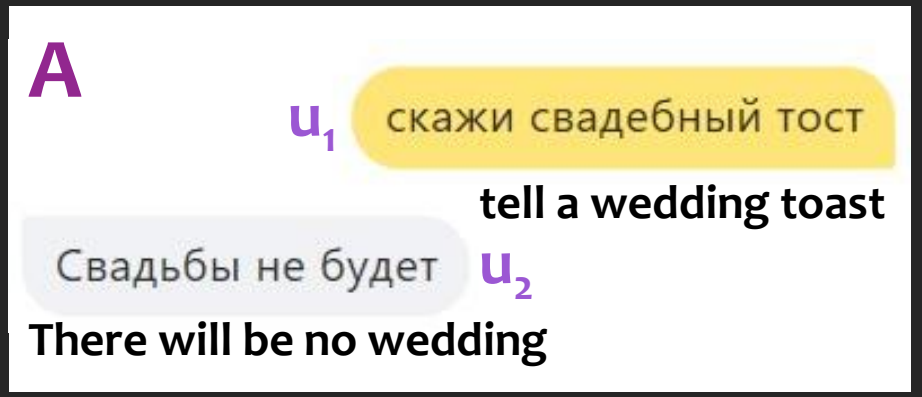
- LA anaphora problem: who is disgusting?

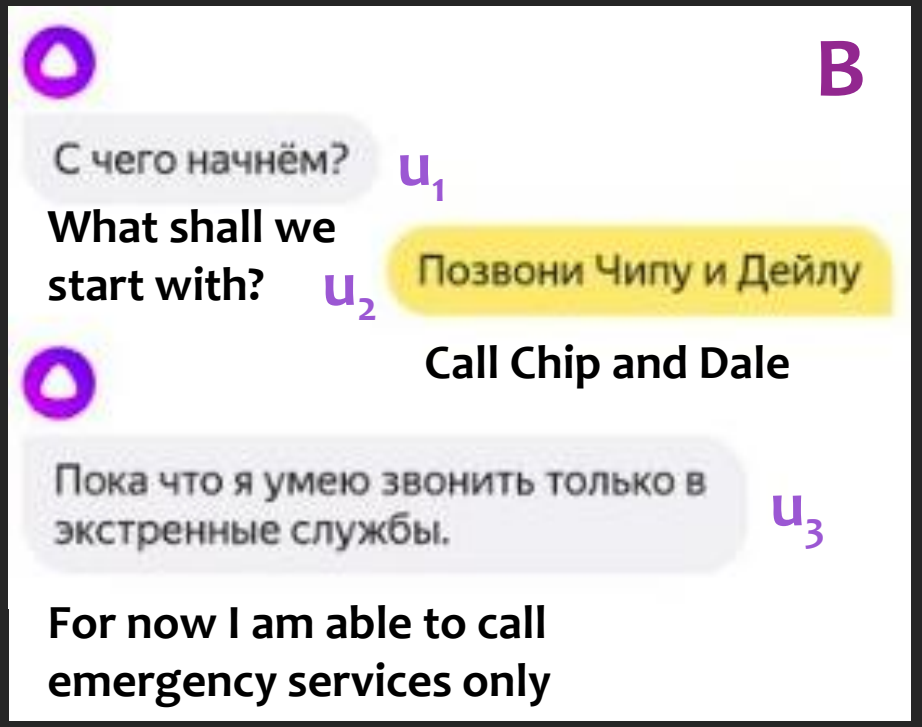


EXAMPLE 3

- u_2 seems to be a frequent utterance in the wedding domain
- Implicit cause?
  [I won't tell a toast because] there will be no wedding
- SI missed presupposition
- SO wrong answer for a request

- Comment by the user: "Since what time they ceased being an emergency service?"
- Complex discourse relationship: cause and contrast
  [I can't call Chip and Dale, because] I can call emergency services only, [but Chip and Dale are not an emergency service]
- SI request was believed legitimate





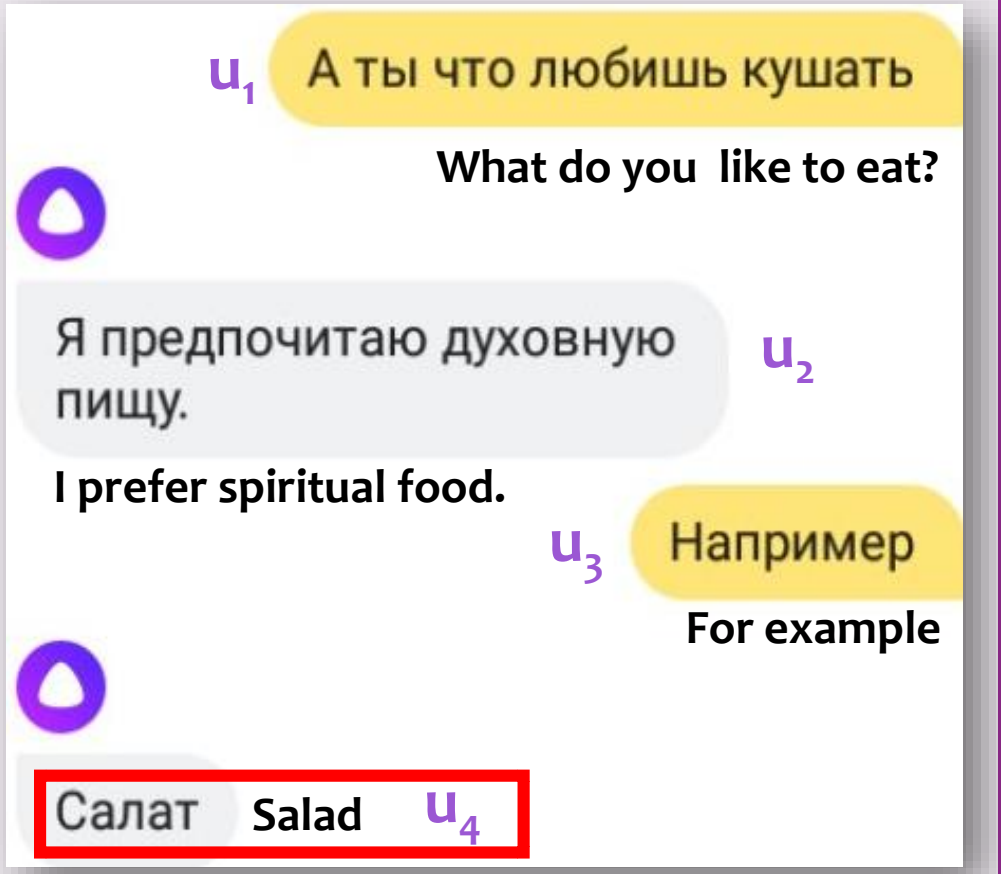
MACHINE LEARNING METHOD

$$\begin{cases} cosine(u_i, u_{i+1}) = x \\ cosine(u_{i+2}, u_{i+3}) \neq x \end{cases}$$

- Create a vector embedding for each utterance with doc2vec algorithm

  In a nutshell: the closer the utterances semantically, the closer to 1 the cosine similarity

- If the cosine similarity between the context and the punch/jab line is considerably different from the cosine similarity between two context utterances, perhaps, a comic effect has occurred



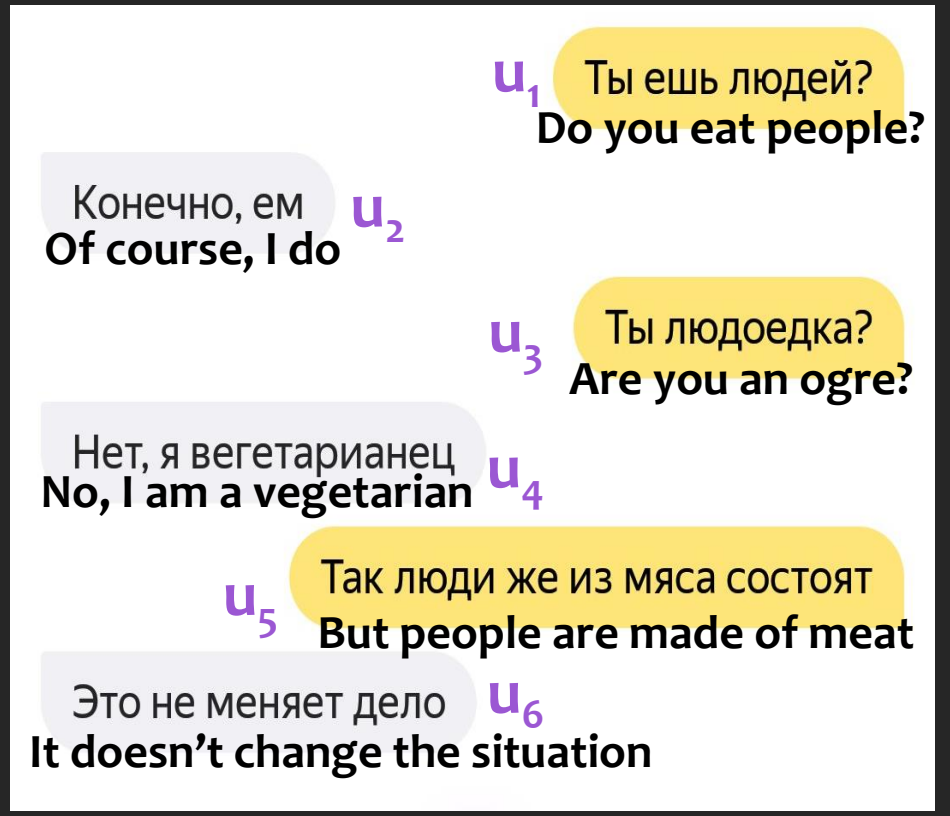
CALCULATION EXAMPLE

$$cosine(u_1, u_2) = 0.021$$

$$cosine(u_3, u_4) = 0.534$$

$$cosine(u_5, u_6) = 0.019$$

Where is the punch/jab line?



CALCULATION EXAMPLE

$cosine(u_1, u_2) = 0.021$

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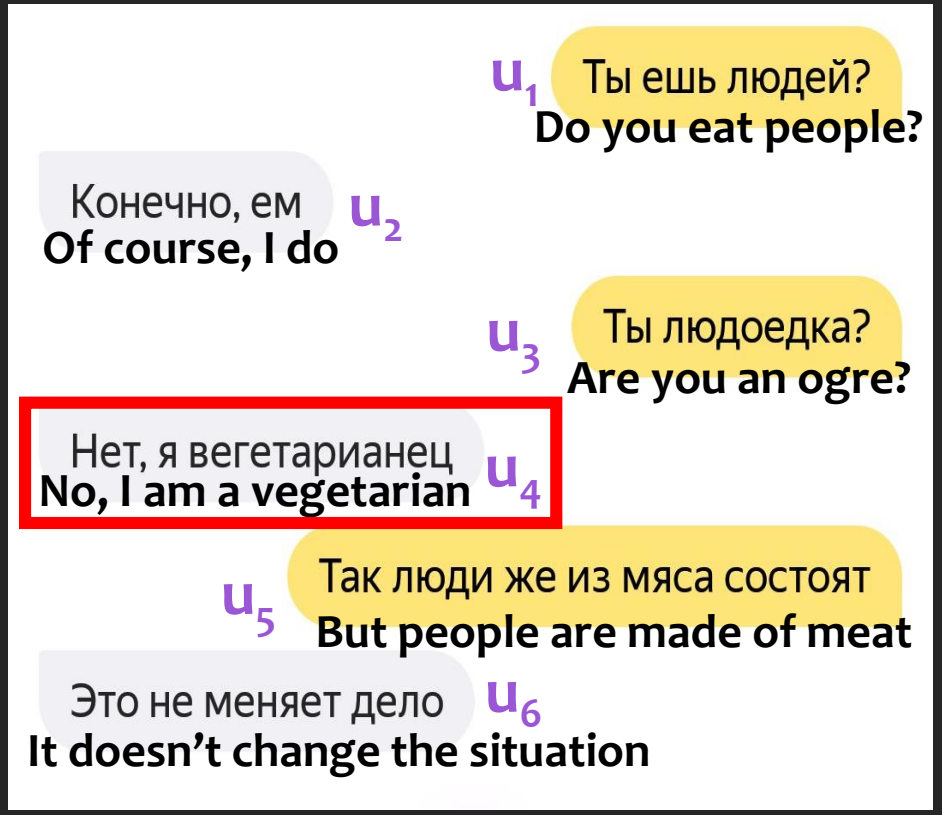
LA antonyms: ogre vs. vegetarian

SO being vegetarian vs. eating people

SI confirmation expected

LM see u_5 : *people* implies *meat*
vegetarian implies *no meat*



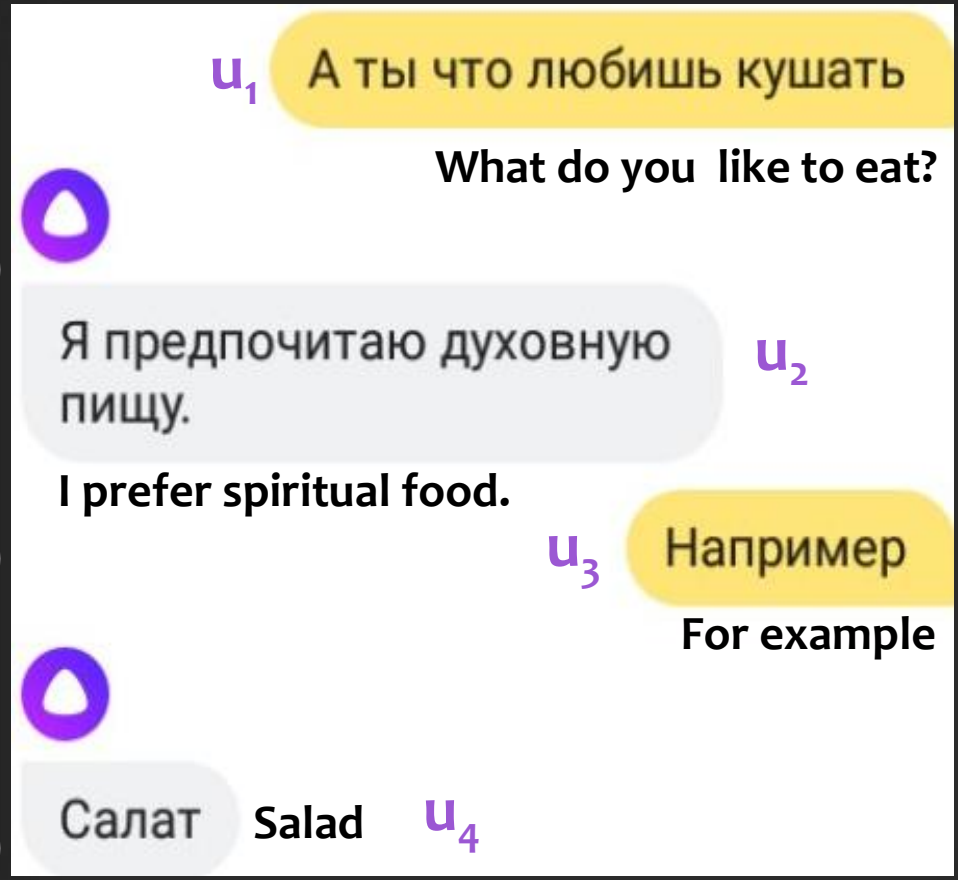
ANOTHER EXAMPLE

- The discourse annotation revealed that the **SO** arises when comparing u_2 to u_4

$$cosine(u_1, u_2) = 0.482$$

$$cosine(u_3, u_4) = 0.445$$

$$cosine(u_2, u_4) = 0.683$$



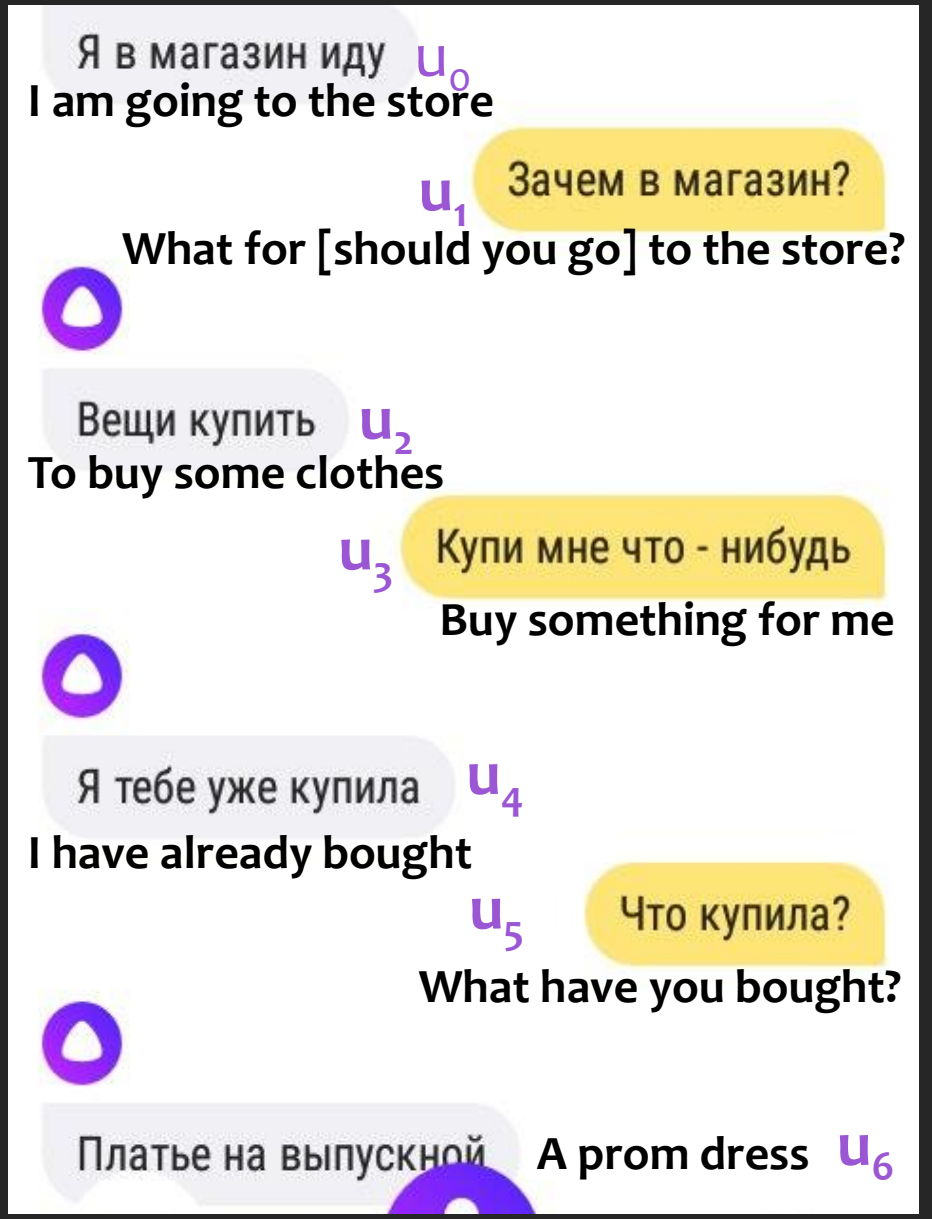
COUNTER EXAMPLE

$$cosine(u_1, u_2) = 0.046$$

$$cosine(u_3, u_4) = 0.059$$

$$cosine(u_5, u_6) = 0.051$$

- Is there a punch/jab line?
- **LM** an assistant can't go to the store
- **SI** posted on Feb, 25
  the user does not need a prom dress?



RESULTS OF THE RESEARCH AND PERSPECTIVES FOR FURTHER STUDIES

- **How does spontaneous humor occur in the state-of-the-art Russian-based dialogue assistant?**
  - ✧ Most often, through SO, LM and LA – both punch lines and jab lines occur
  - ✧ Sometimes through SI, but more metadata is needed
  - ✧ Never through TA and NS
    - ➲ collect and process more data, including metadata
    - ➲ conduct surveys to determine how funny a dialogue is
- **In what discourse situations spontaneous humor is more probable?**
  - ✧ All the four major relations are represented
  - ✧ Different relations interact with different KRs
    - ➲ perform correlation analyses
- **Is there a way to detect spontaneous humor automatically?**
  - ✧ The presented method works for humour due to LA and (partly) SO and LM
  - ✧ The presented method does not work for humour due to SI
  - ✧ Automated detection impossible without DR and KR annotation
    - ➲ refine the method to detect more humour due to SO and LM
    - ➲ include DR and KR tags into training data

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Thank you! Your comments are very welcome!

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