Studying the anticipation of QUDs and discourse relations by crowdsourcing a dataset of 'evoked questions'

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Why wouldn't they use their prostheses?

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Why wouldn't they use their prostheses?
Why do they not use their prostheses?

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How old are you now?
Why didn't amputees use their prostheses?

Research questions

Could evoked questions provide a useful empirical window on discourse structure?

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Why would they?

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Questions Under Discussion

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- Discourse is (can be modeled as) a process of raising and resolving questions. ≠interrogatives
- These questions can be implicit or made (partially) explicit.
- The QUD of a given discourse move is the question it targets.
- Discourse progresses from question to question in a reasonable/rational/natural way.

… and evoked questions?

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- If part of a discourse strongly *evokes* a certain question…
- …and this question happens to be answered by the next discourse move…
- …then that question is very likely its QUD.

The example again

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How old are you now?
Why didn't amputees use their prostheses?

The reason, I would come to find out, was that their prosthetic sockets were painful [...]

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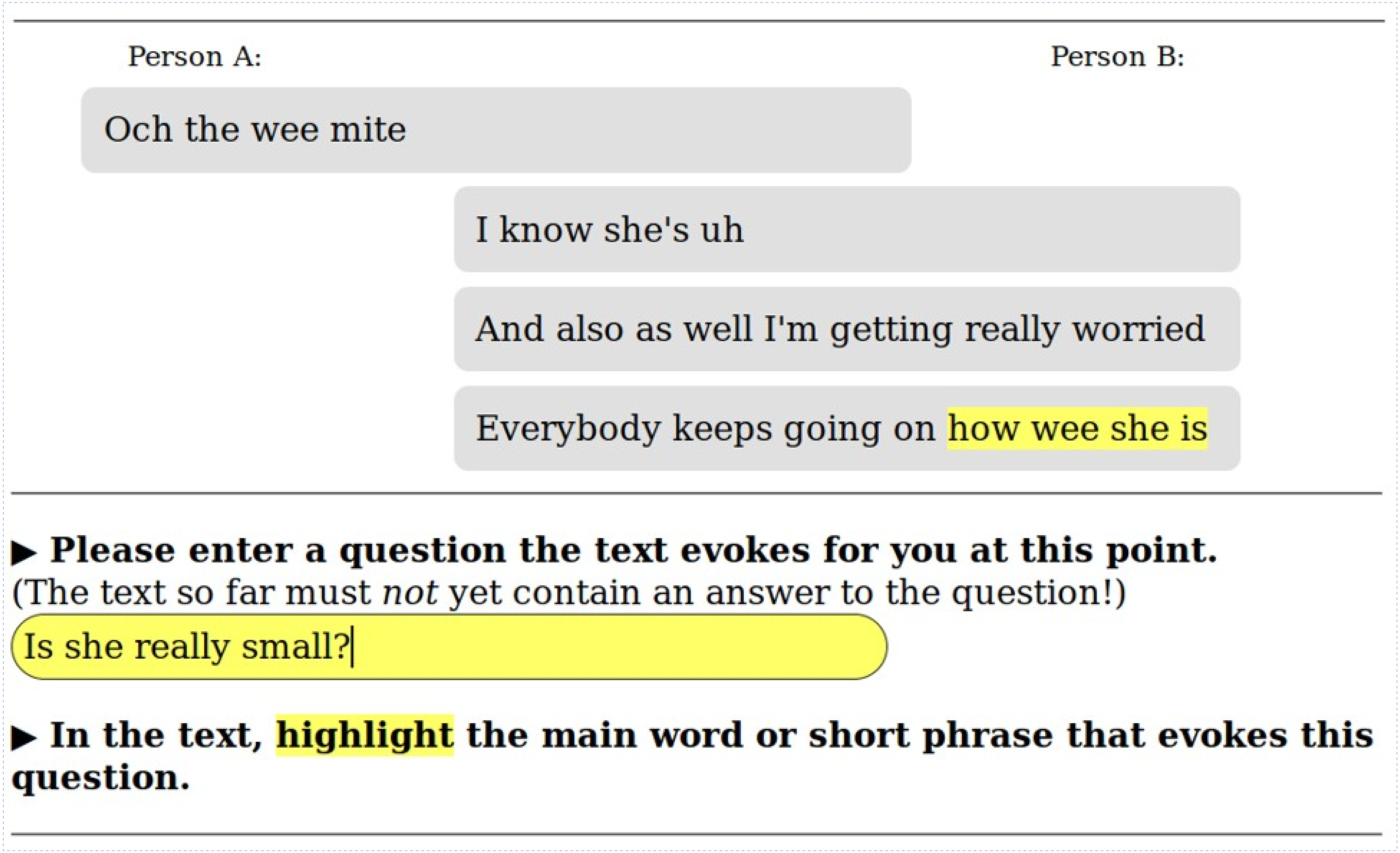
Unless we do it via evoked questions!

Elicitation tool

spellout.net/ibexexps/mwestera/evoque/

Elicitation tool



Person A:

Person B:

Och the wee mite

I know she's uh

And also as well I'm getting really worried

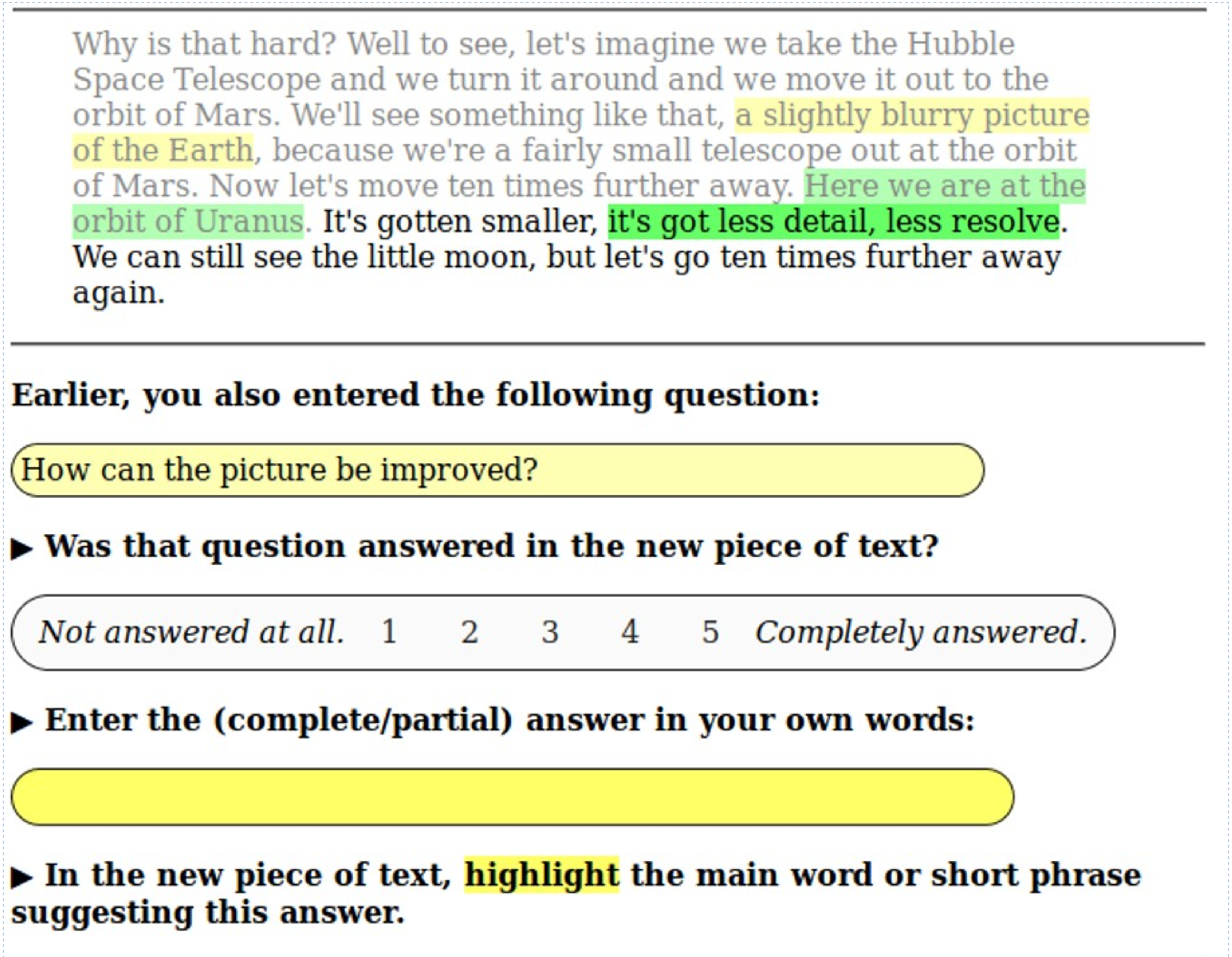
Everybody keeps going on how wee she is

▶ **Please enter a question the text evokes for you at this point.**
(The text so far must *not* yet contain an answer to the question!)

Is she really small?

▶ **In the text, highlight the main word or short phrase that evokes this question.**

Elicitation tool



Why is that hard? Well to see, let's imagine we take the Hubble Space Telescope and we turn it around and we move it out to the orbit of Mars. We'll see something like that, a slightly blurry picture of the Earth, because we're a fairly small telescope out at the orbit of Mars. Now let's move ten times further away. Here we are at the orbit of Uranus. It's gotten smaller, it's got less detail, less resolve. We can still see the little moon, but let's go ten times further away again.

Earlier, you also entered the following question:

How can the picture be improved?

▶ **Was that question answered in the new piece of text?**

Not answered at all. 1 2 3 4 5 *Completely answered.*

▶ **Enter the (complete/partial) answer in your own words:**

▶ **In the new piece of text, highlight the main word or short phrase suggesting this answer.**

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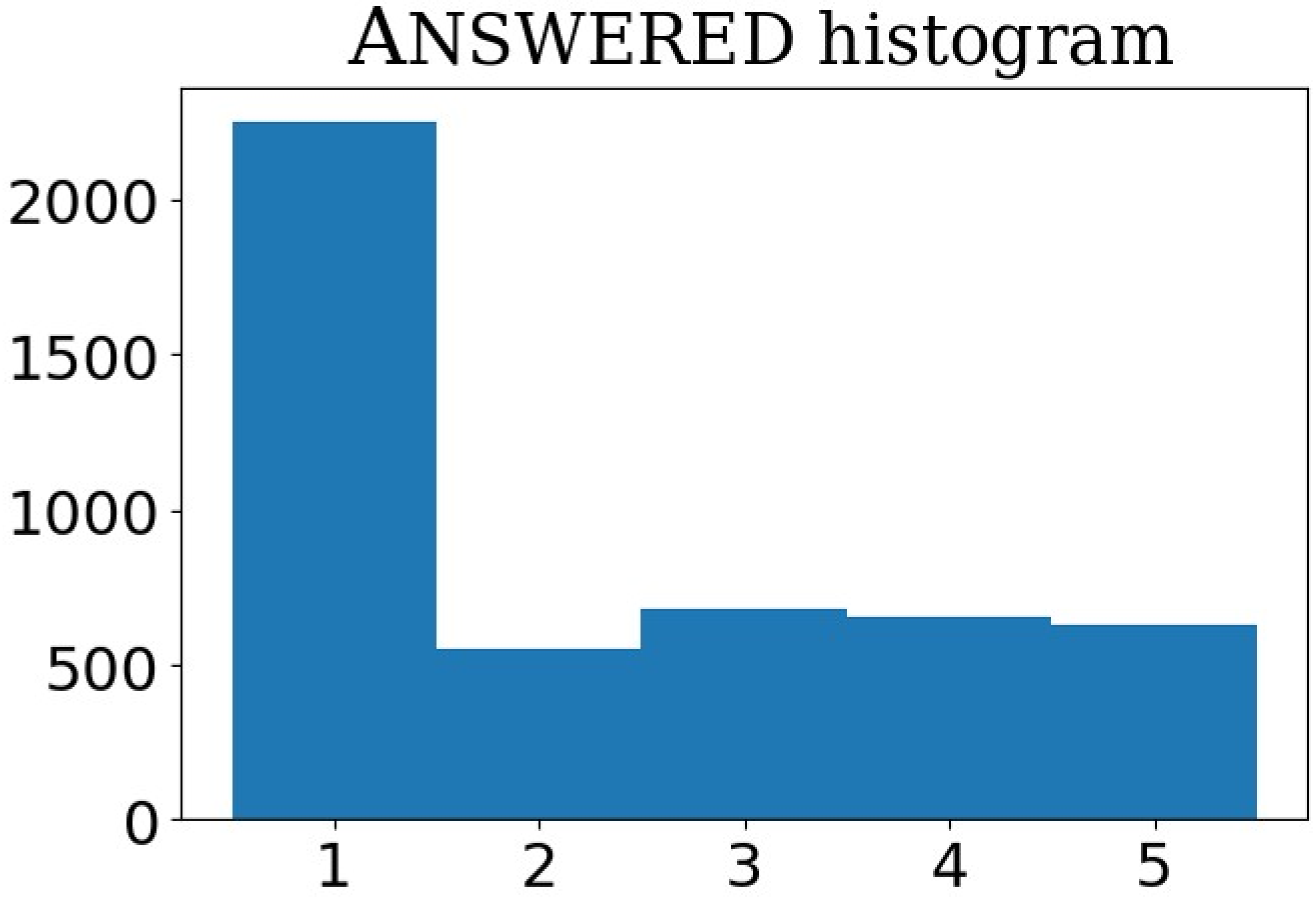
- 50 mins (estim.); reward $8.50.
- **Result:** 863 probes; 4765 questions; 1965 answers.

How many questions get answered?



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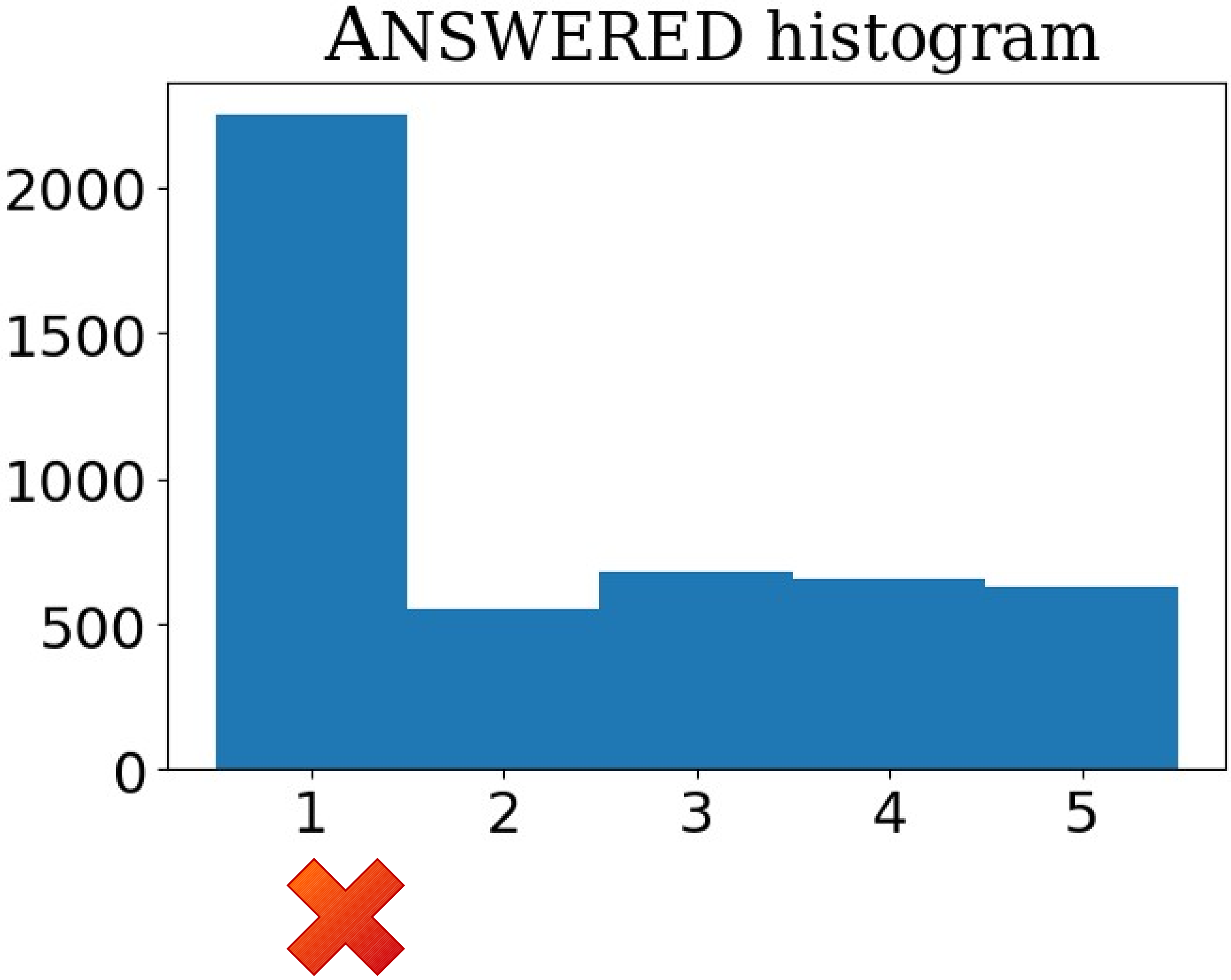

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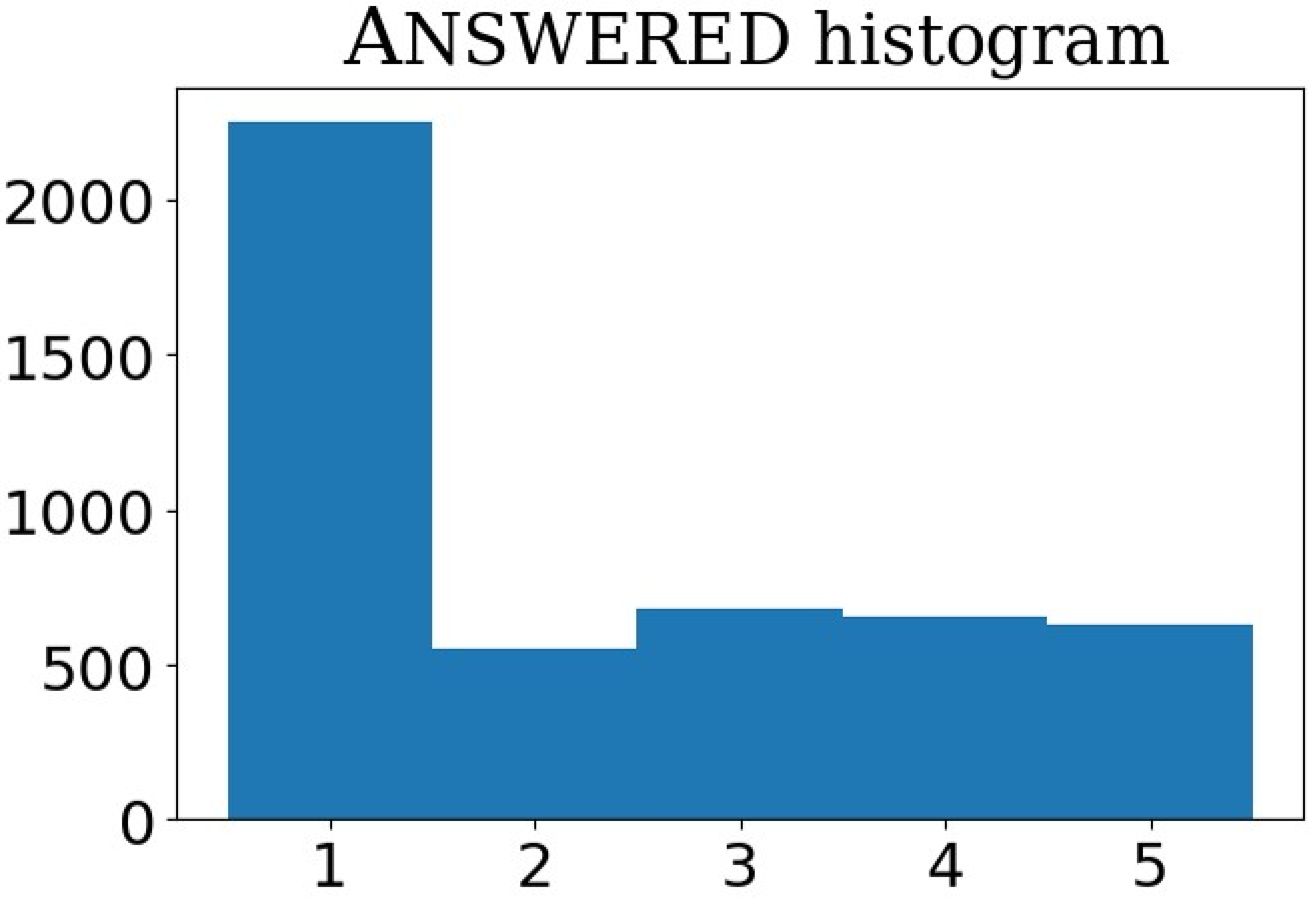
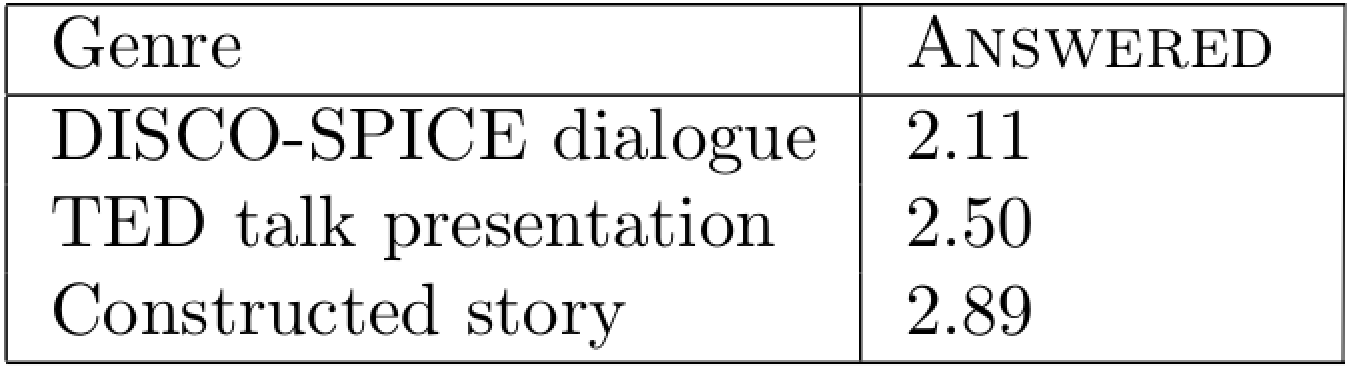


✗ ✓

Mean ANSWERED per genre



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TED talk presentation	2.50
Constructed story	2.89

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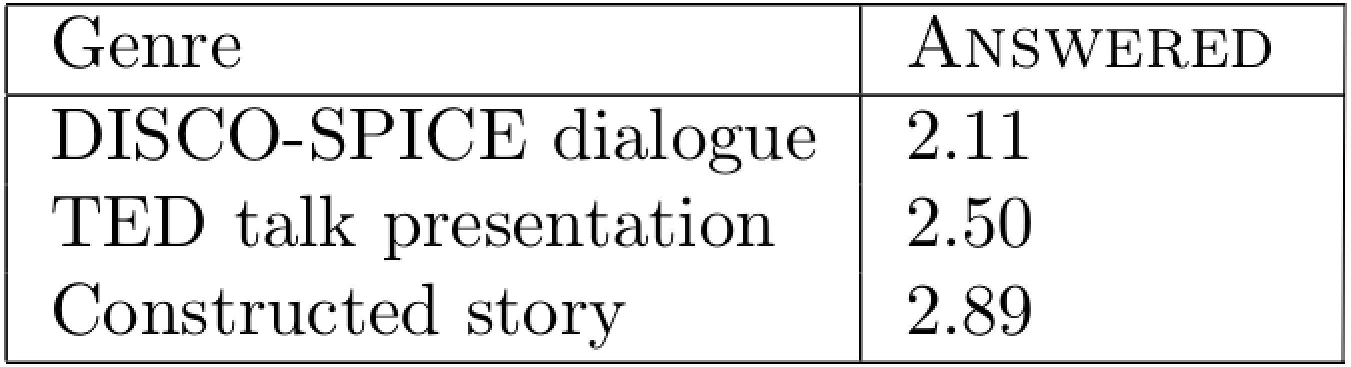

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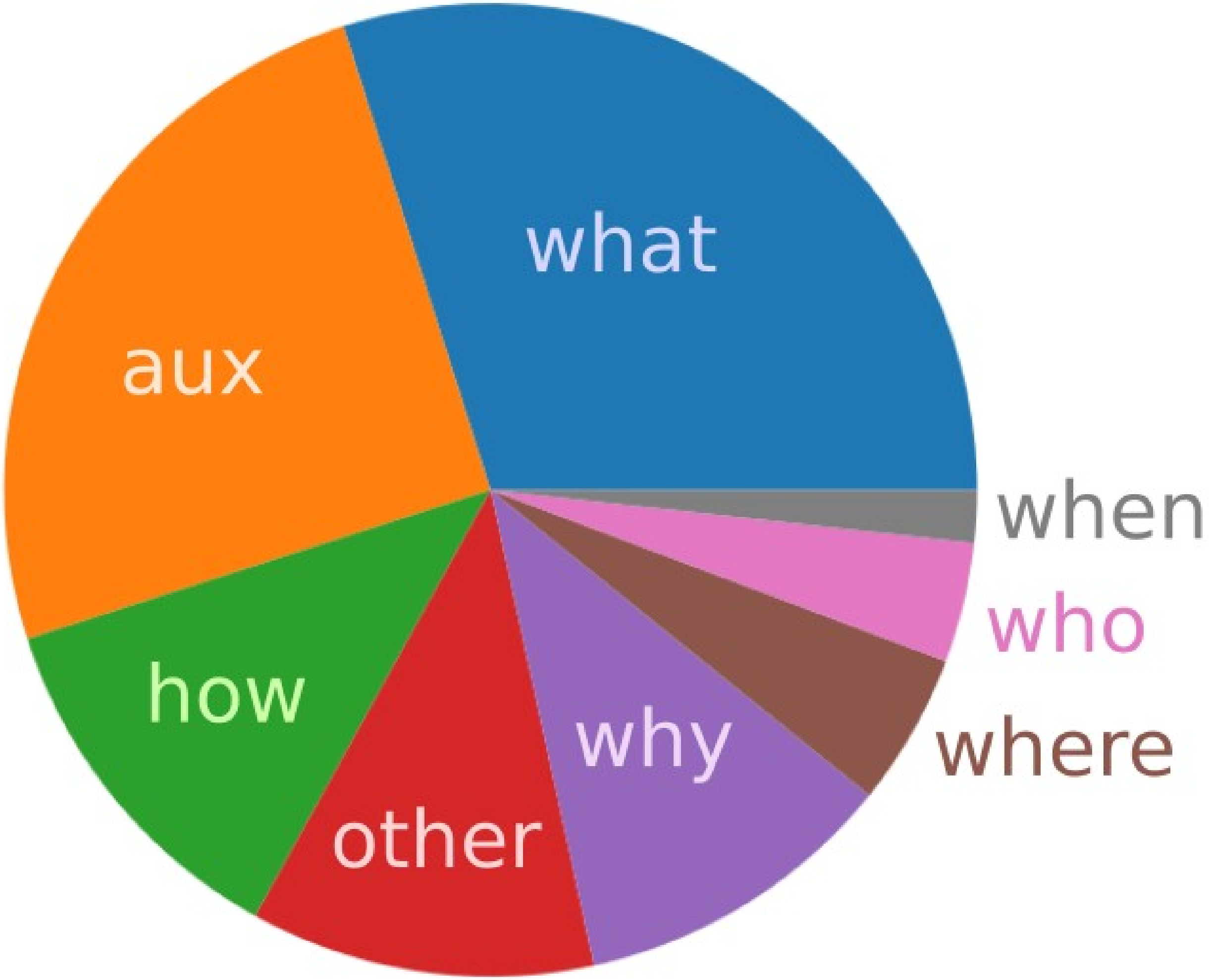
- ANSWERED score of evoked question = ANSWERED score of its best answer (scale 1-5).

Question types: DISCO-SPICE



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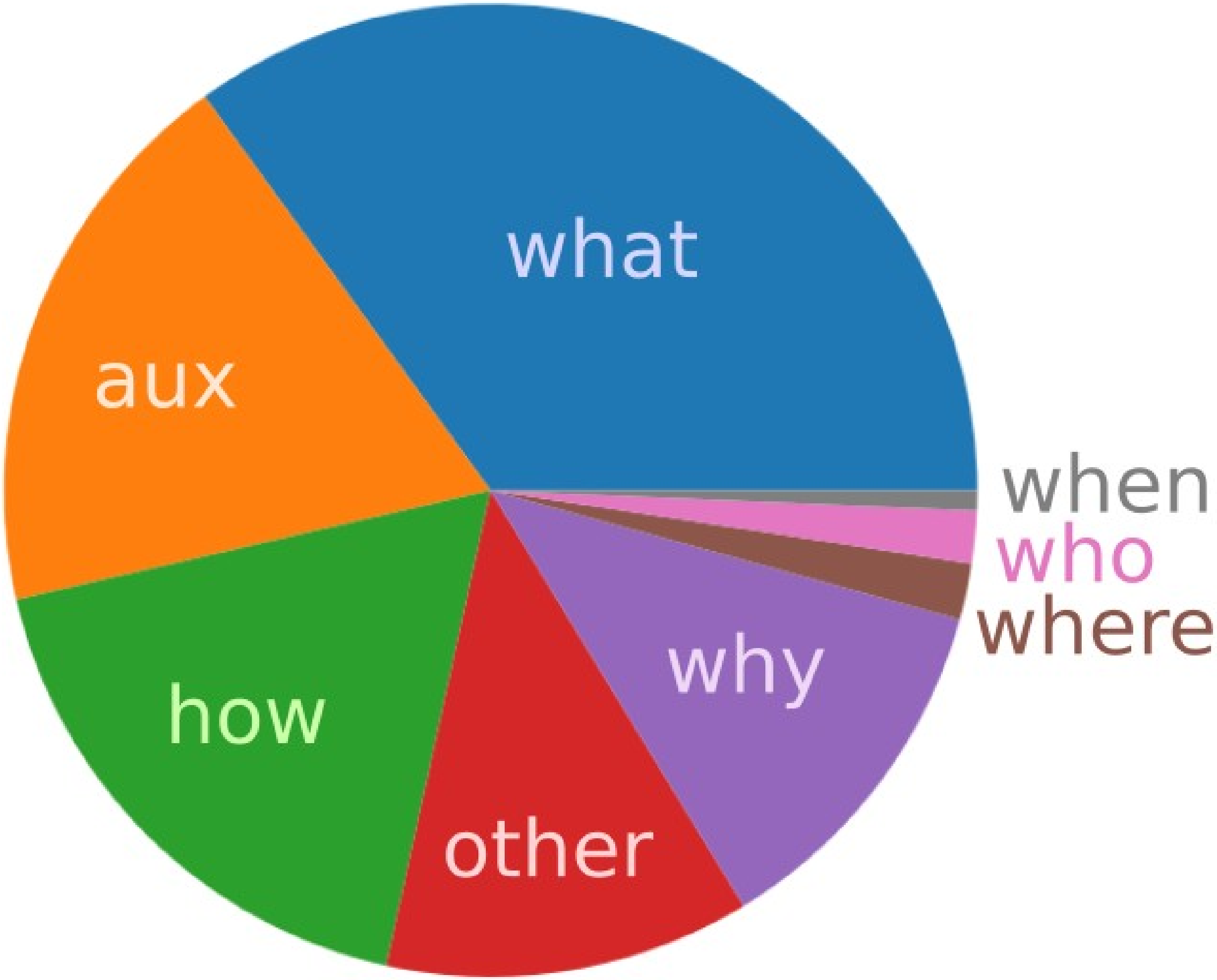
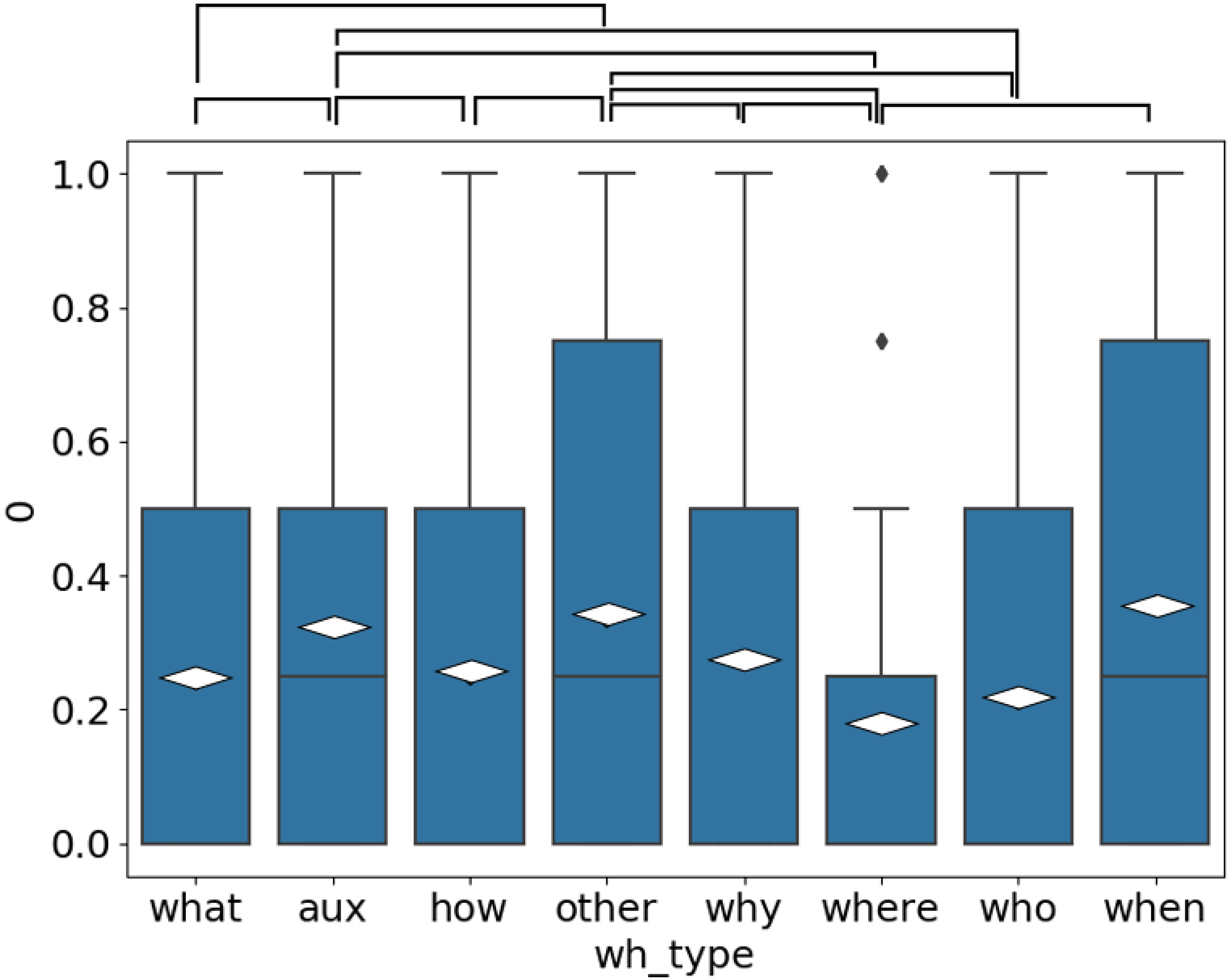


ANSWERED per Q-type: DISCO-SPICE



Research questions

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No idea?

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- So we further annotated and analyzed our TED-portion, and submitted it to LREC as **TED-Q**.

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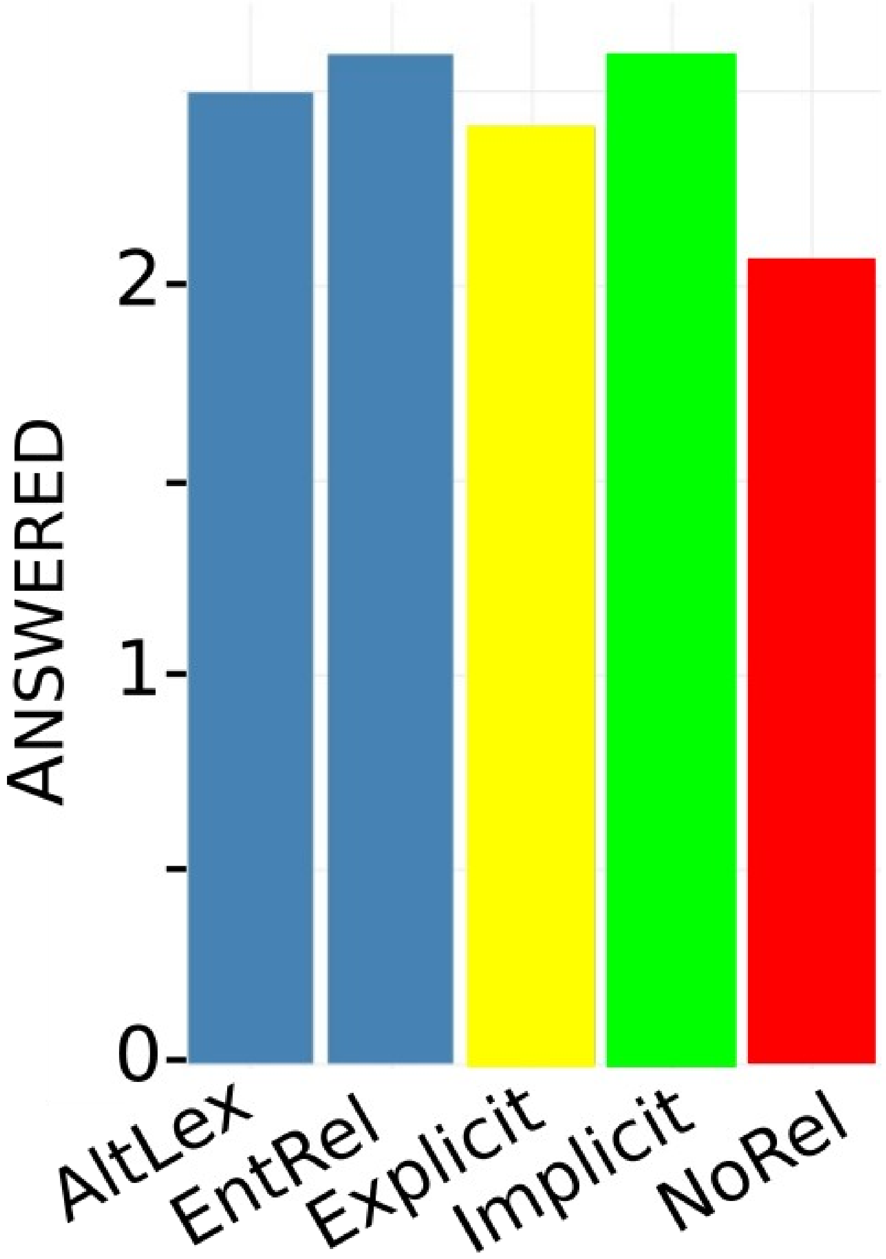
- TED-Q gives us a measure of discourse structure predictability (ANSWERED).
- TED-MDB tells us what the discourse structure actually is…
- … and whether it is made explicit or not (connectives).

Explicit vs. implicit Discourse Rel.



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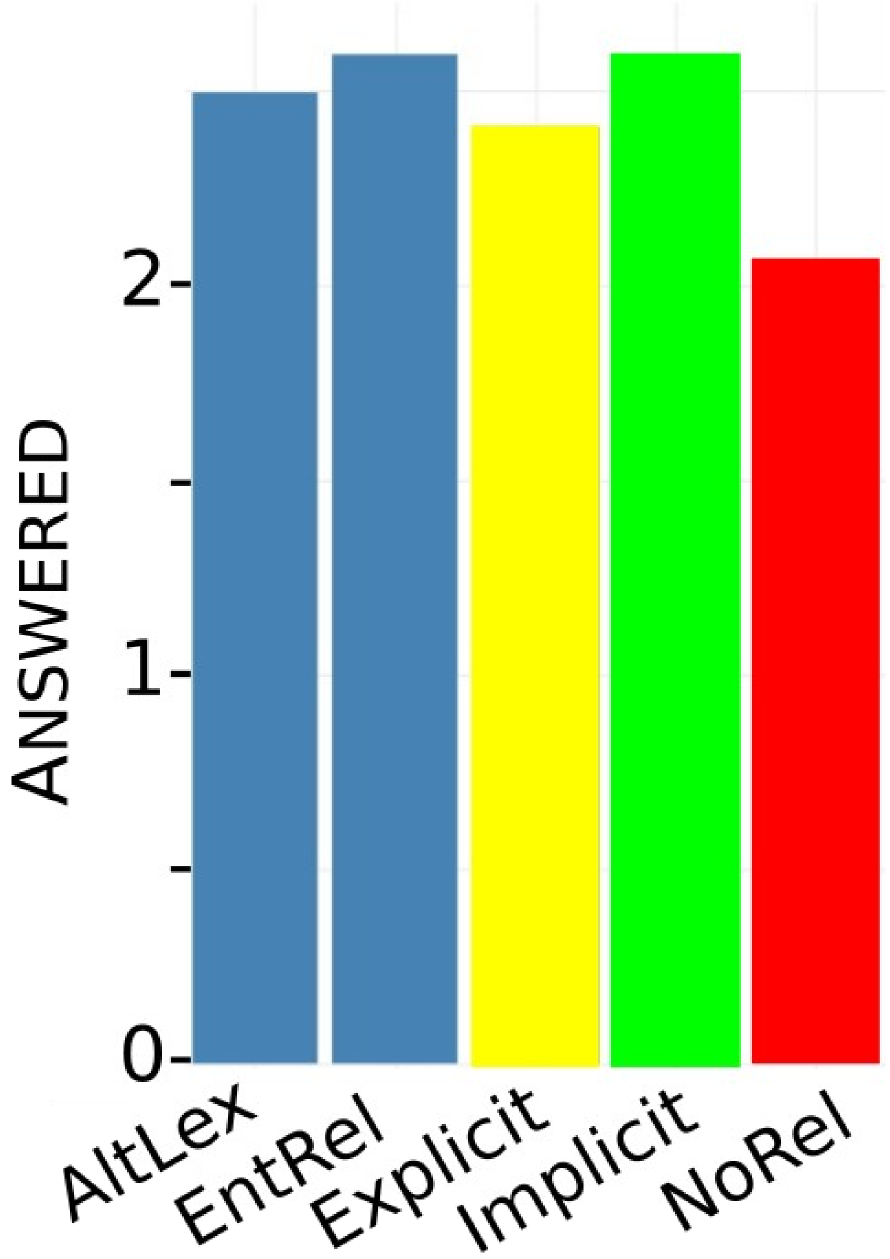

ANSWERED rating:

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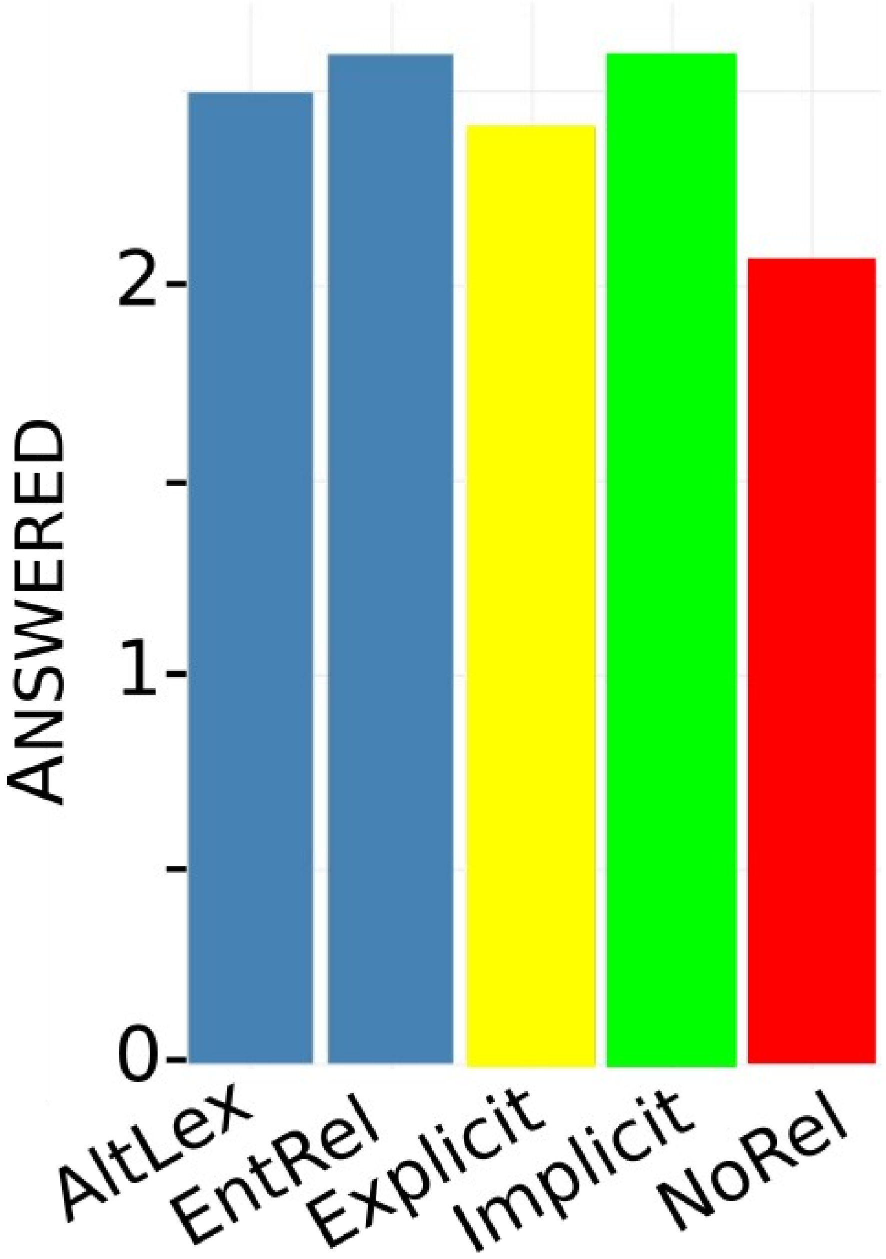

ANSWERED rating:

- Explicit < Implicit (t(1580)=2.39, p=.016)
- NoRel < others (t(2219)=4.71, p<.0001)

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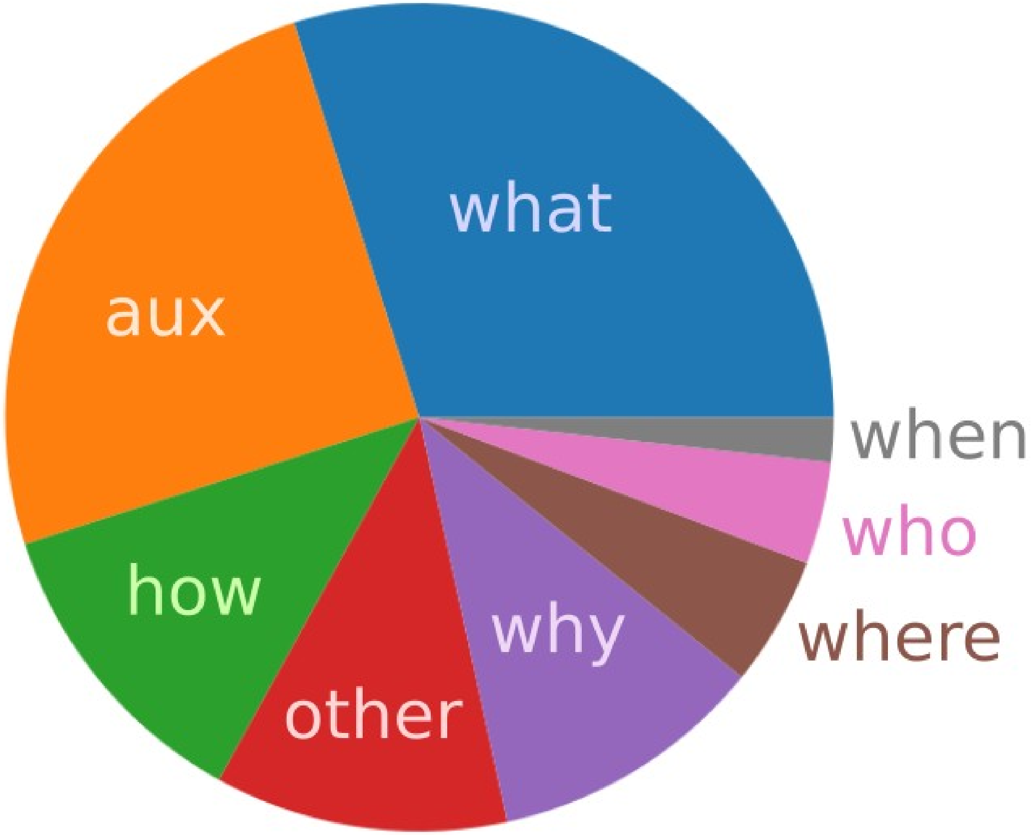

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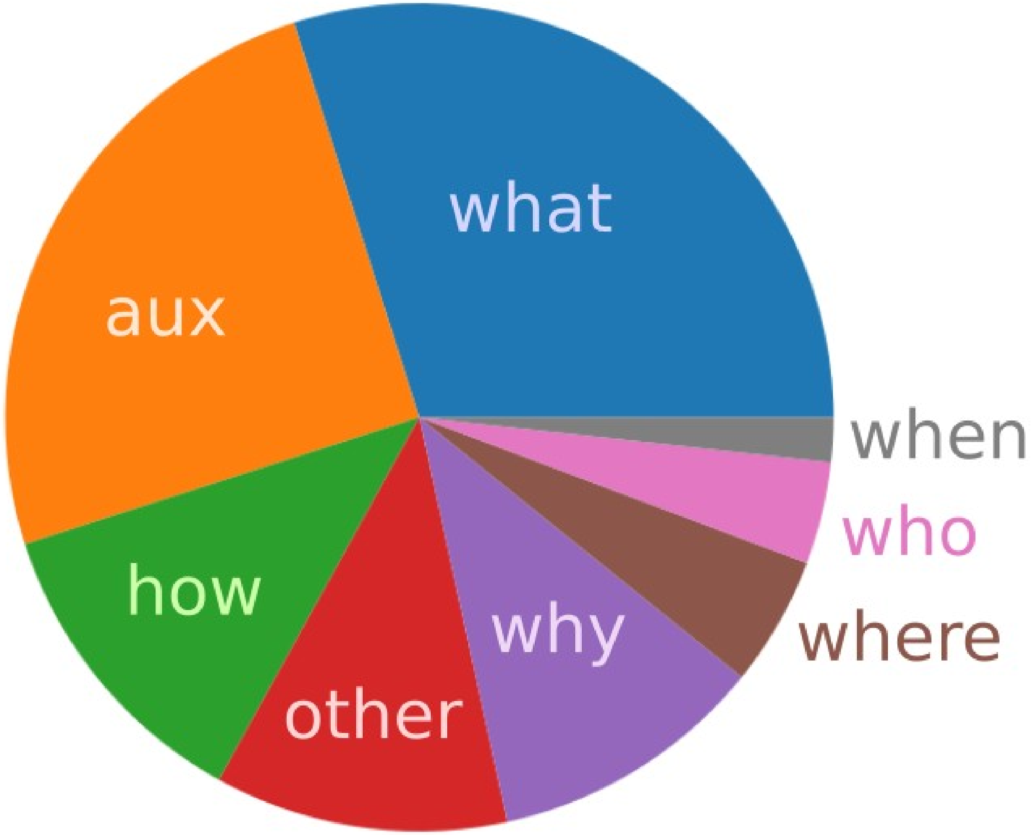

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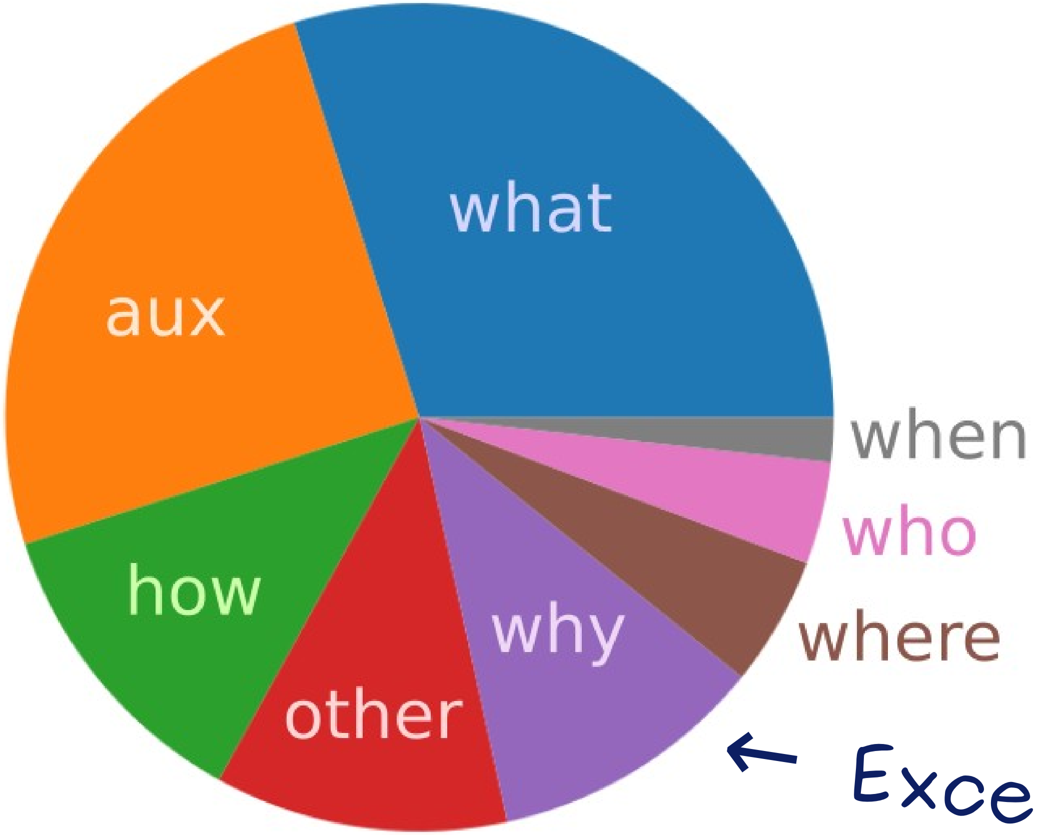

← Except here!
12%→19% (p<.01)

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  - "Continuous relations more predictable."
- TED-MDB + TED-Q enables a new kind of confirmation:
  - without prior assumptions about predictability;
  - purely data-driven, quantitative, context-sensitive.

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What are some reasons the homeless might give for living like they do?
Why would anyone live such a dangerous life?
Why are these laws like this?
Why choose homelessness?

Annotating question relatedness

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- Crowdsourced task:

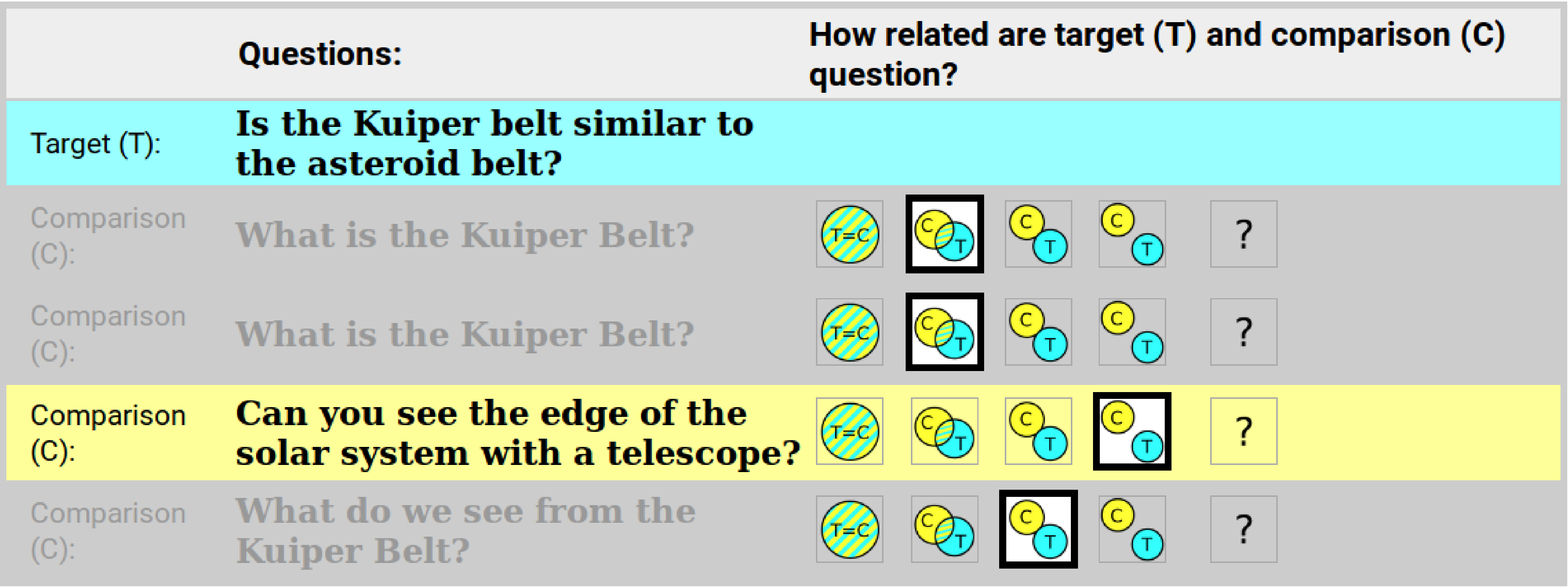
  https://workersandbox.mturk.com/projects/3L2A3M5C0728O1QYNC4O7LNJPOCGQW/tasks

Annotating question relatedness

- **Please read the snippet:**

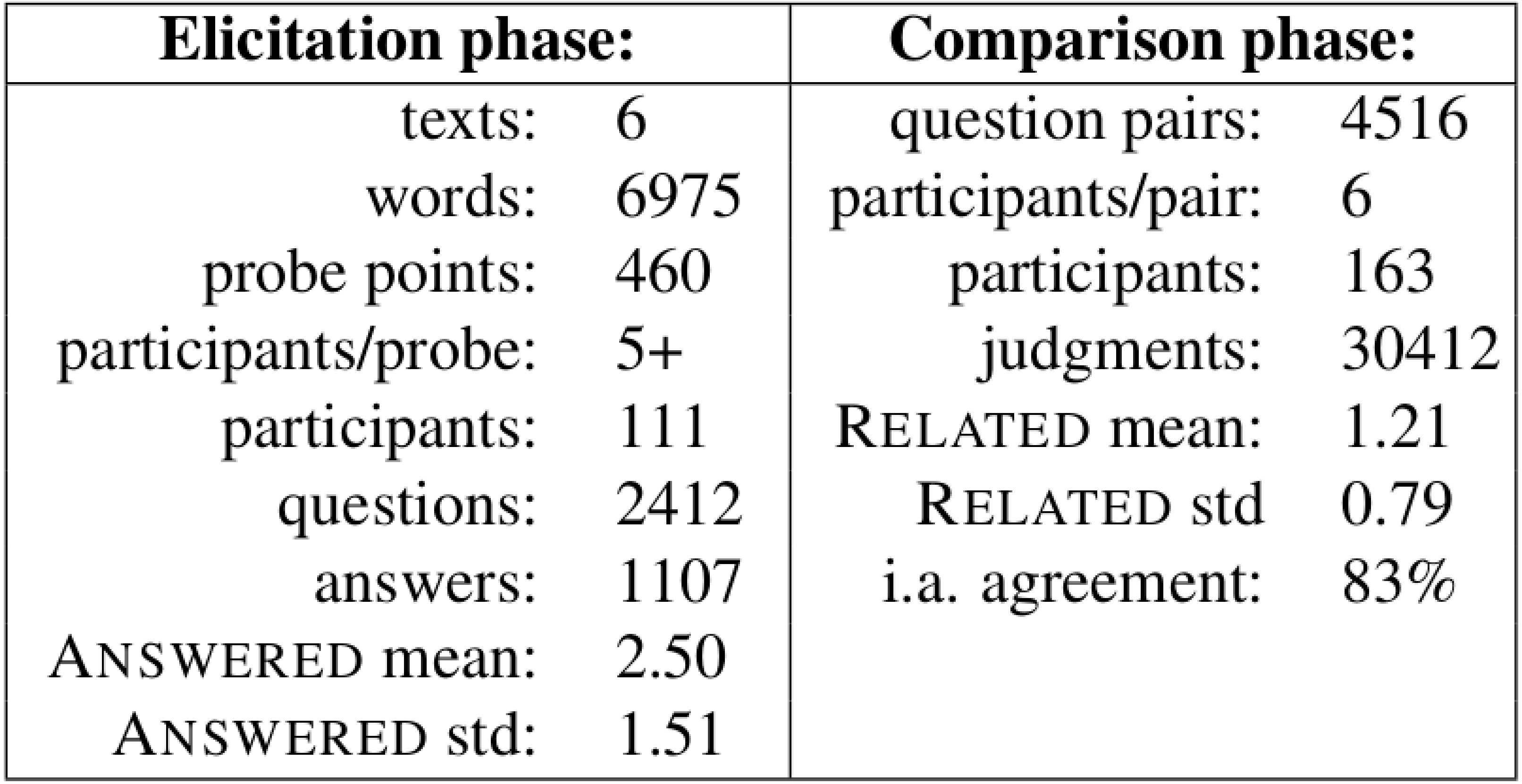
> […] We can still see the little moon, but let's go ten times further away again. Here we are at the edge of the solar system, out at the Kuiper Belt.

- **Next, compare the questions it evoked:**



	Questions:	**How related are target (T) and comparison (C) question?**
Target (T):	**Is the Kuiper belt similar to the asteroid belt?**	
Comparison (C):	What is the Kuiper Belt?	T=C [✓ C T] C T C T ?
Comparison (C):	What is the Kuiper Belt?	T=C [✓ C T] C T C T ?
Comparison (C):	**Can you see the edge of the solar system with a telescope?**	T=C C T C T [✓ C T] ?
Comparison (C):	What do we see from the Kuiper Belt?	T=C C T [✓ C T] C T ?

Our resulting dataset: TED-Q



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texts:	6	question pairs:	4516
words:	6975	participants/pair:	6
probe points:	460	participants:	163
participants/probe:	5+	judgments:	30412
participants:	111	RELATED mean:	1.21
questions:	2412	RELATED std	0.79
answers:	1107	i.a. agreement:	83%
ANSWERED mean:	2.50		
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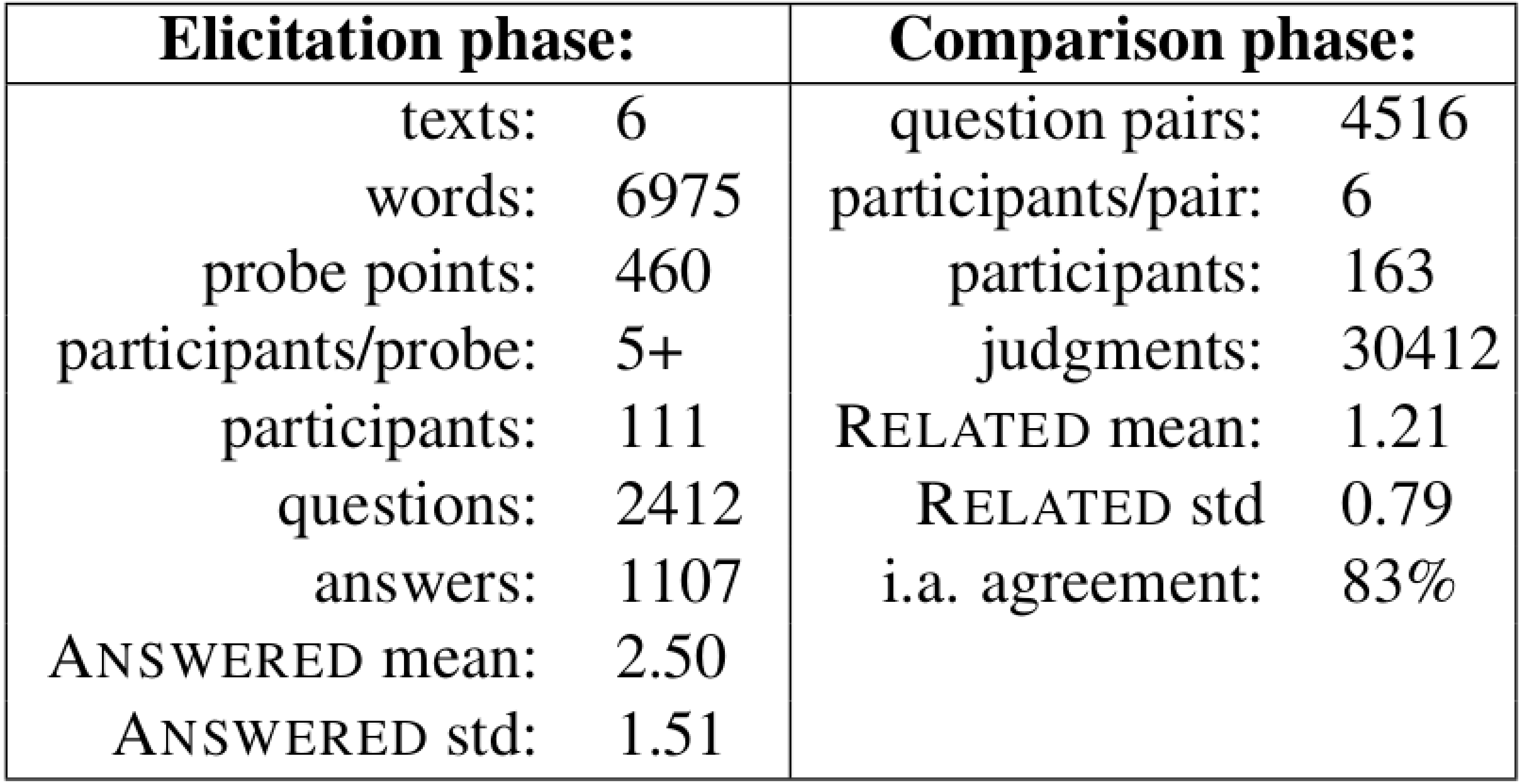

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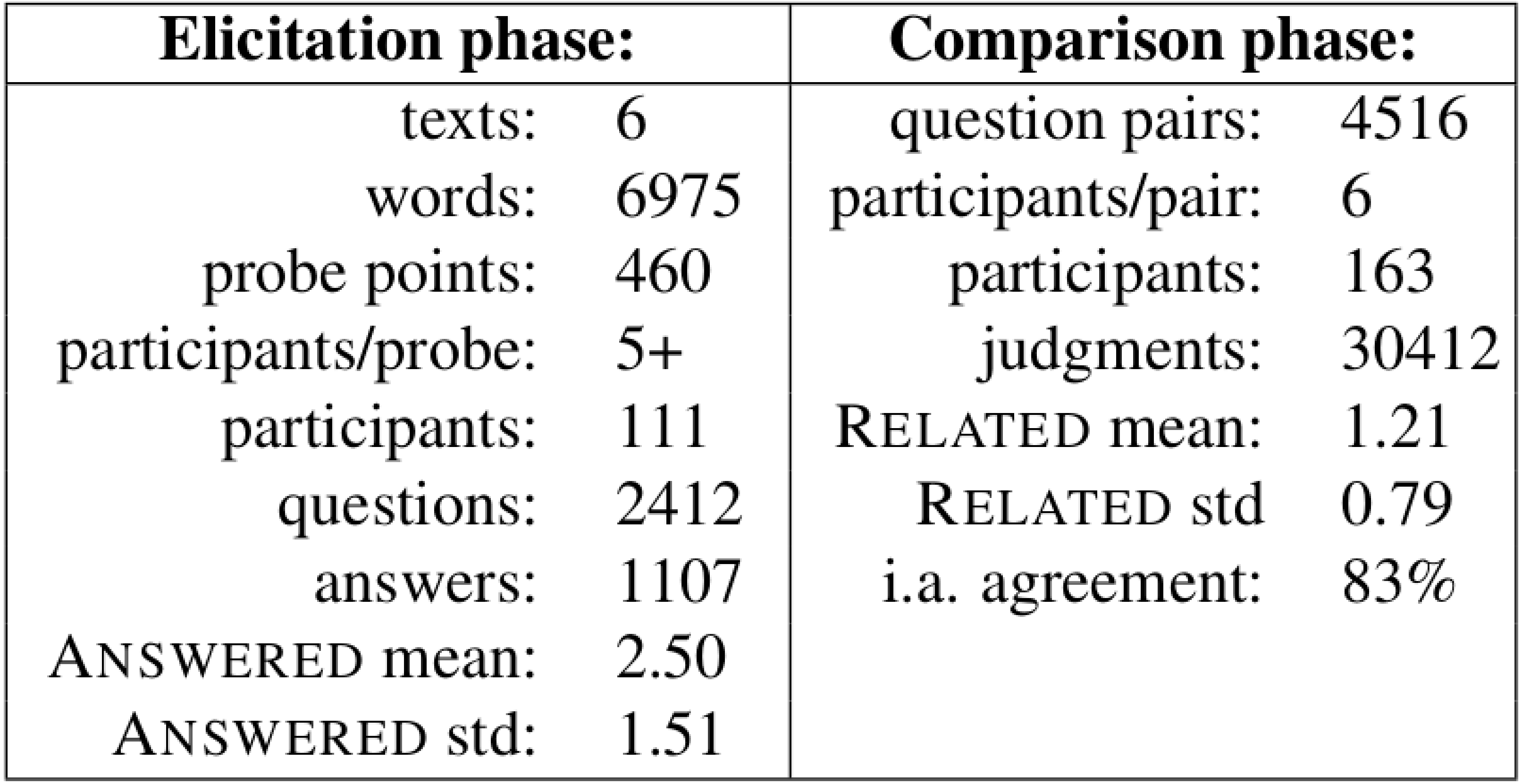

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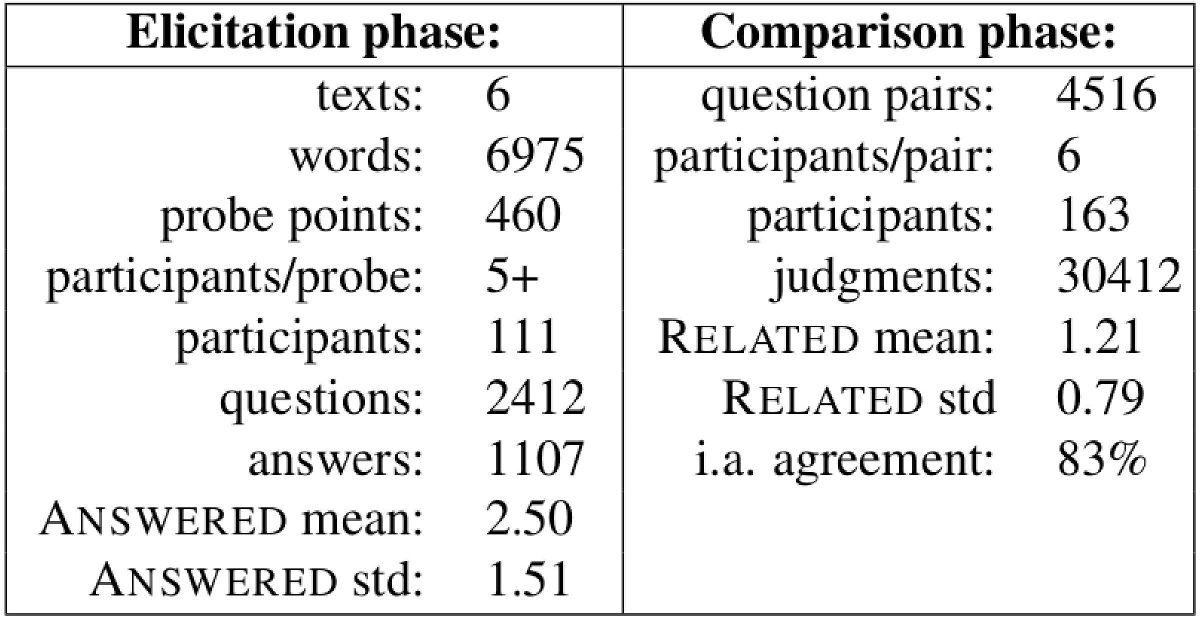
(0…3)

(1…5)

Our resulting dataset: TED-Q

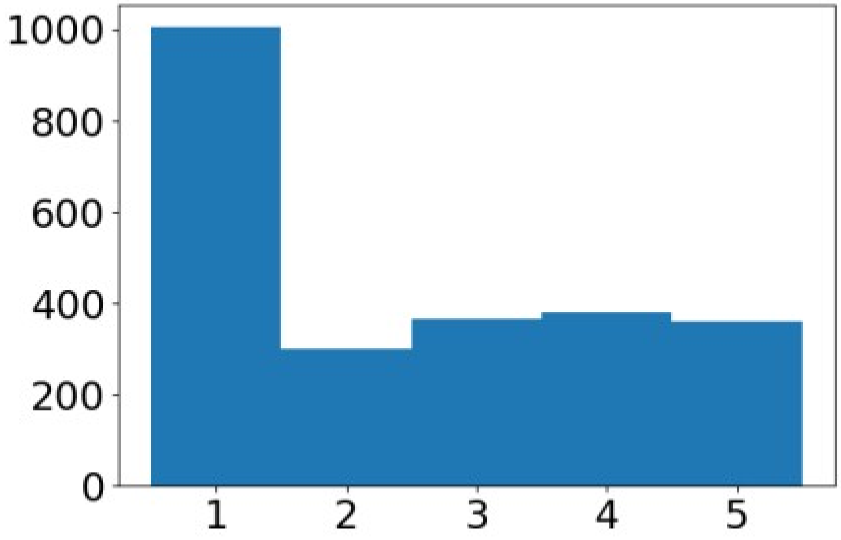


Elicitation phase:		Comparison phase:	
texts:	6	question pairs:	4516
words:	6975	participants/pair:	6
probe points:	460	participants:	163
participants/probe:	5+	judgments:	30412
participants:	111	RELATED mean:	1.21
questions:	2412	RELATED std	0.79
answers:	1107	i.a. agreement:	83%
ANSWERED mean:	2.50		
ANSWERED std:	1.51		

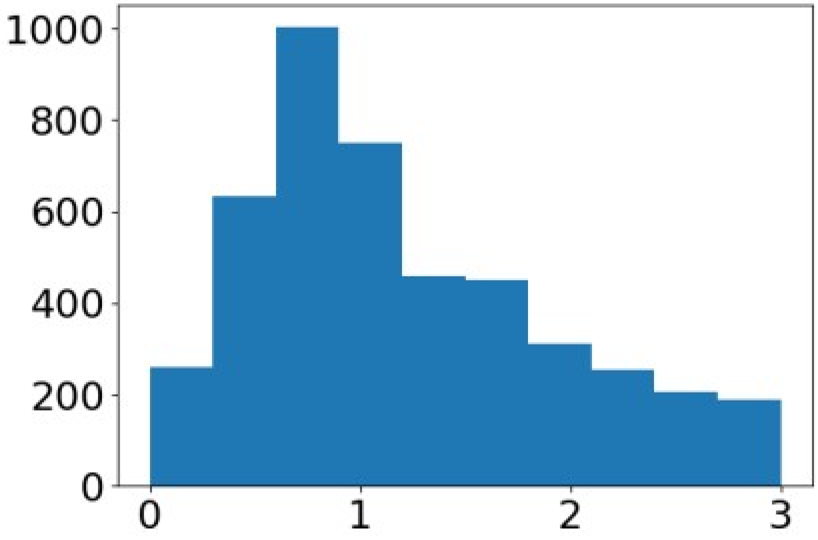
Our resulting dataset: TED-Q

Elicitation phase:		Comparison phase:	
texts:	6	question pairs:	4516
words:	6975	participants/pair:	6
probe points:	460	participants:	163
participants/probe:	5+	judgments:	30412
participants:	111	RELATED mean:	1.21
questions:	2412	RELATED std	0.79
answers:	1107	i.a. agreement:	83%
ANSWERED mean:	2.50		
ANSWERED std:	1.51		

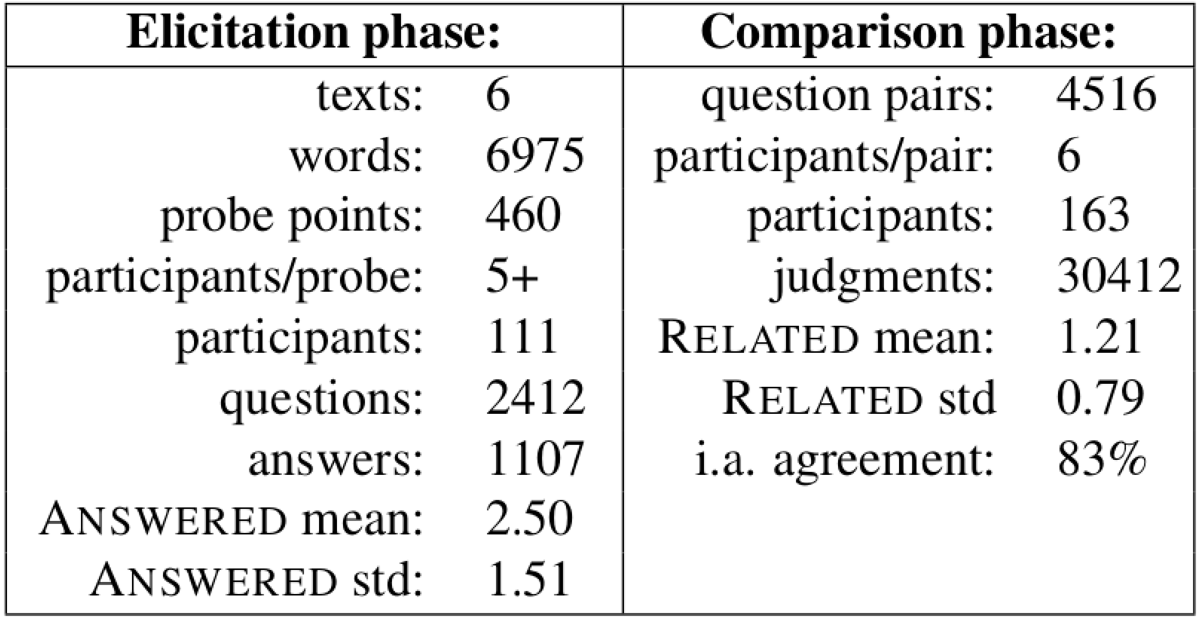
ANSWERED



RELATED

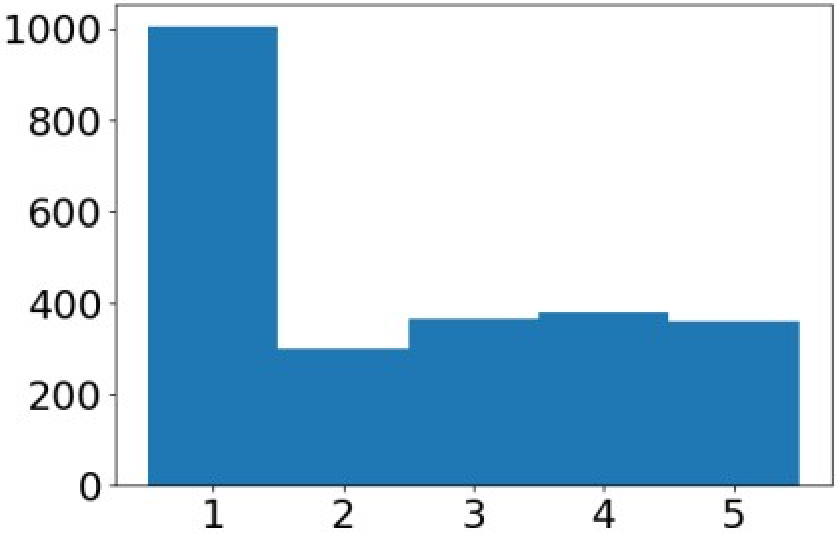


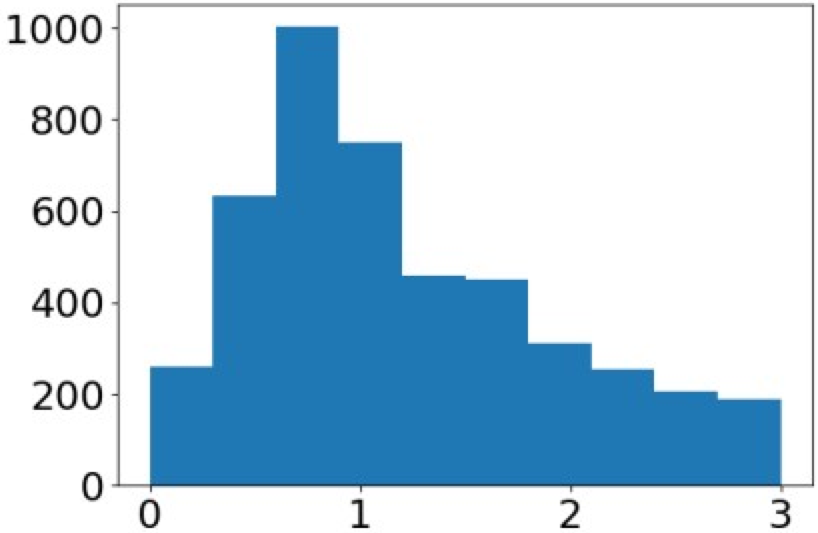
Our resulting dataset: TED-Q



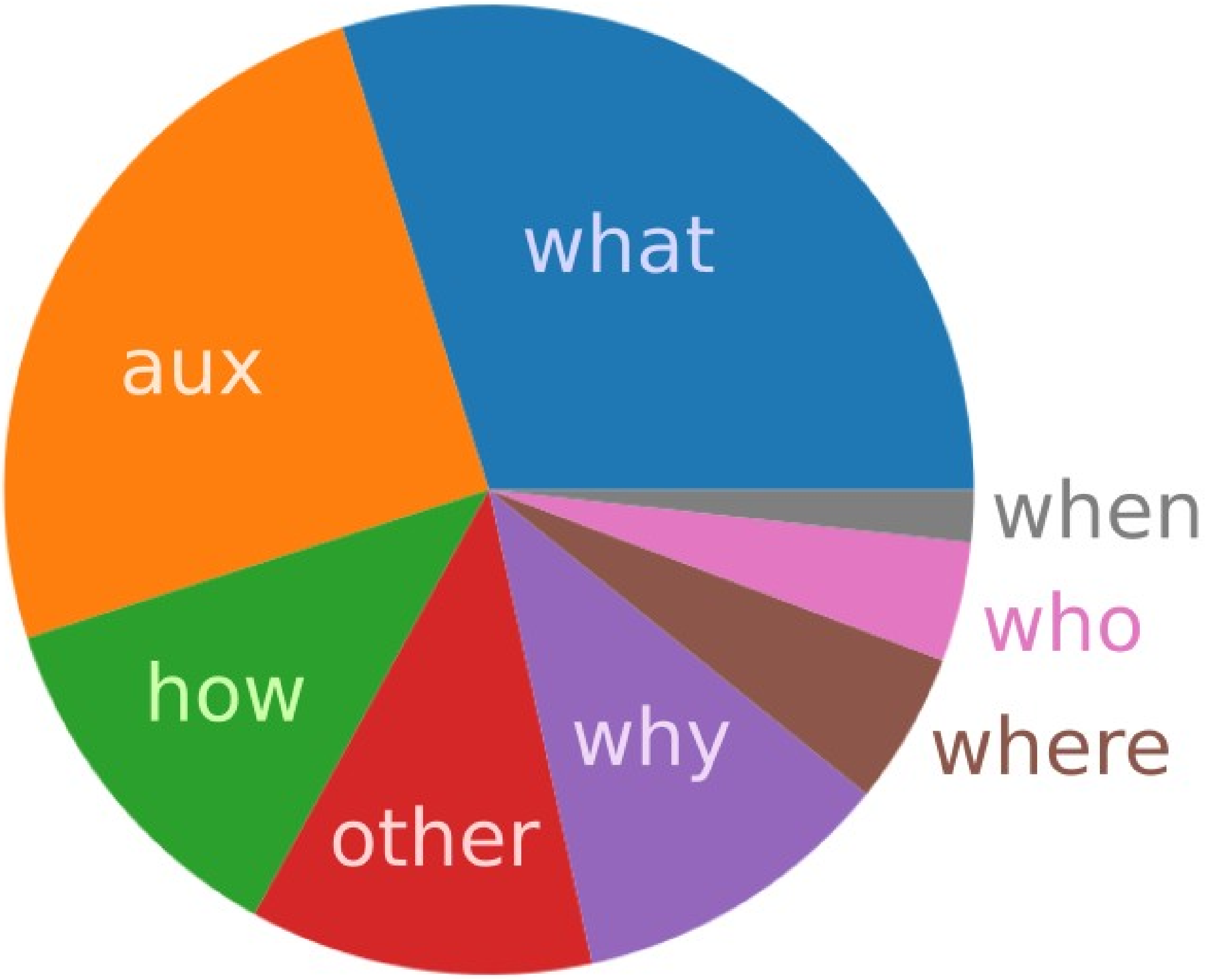
Elicitation phase:		Comparison phase:	
texts:	6	question pairs:	4516
words:	6975	participants/pair:	6
probe points:	460	participants:	163
participants/probe:	5+	judgments:	30412
participants:	111	RELATED mean:	1.21
questions:	2412	RELATED std	0.79
answers:	1107	i.a. agreement:	83%
ANSWERED mean:	2.50		
ANSWERED std:	1.51		

ANSWERED ← Spearman 0.17 → RELATED

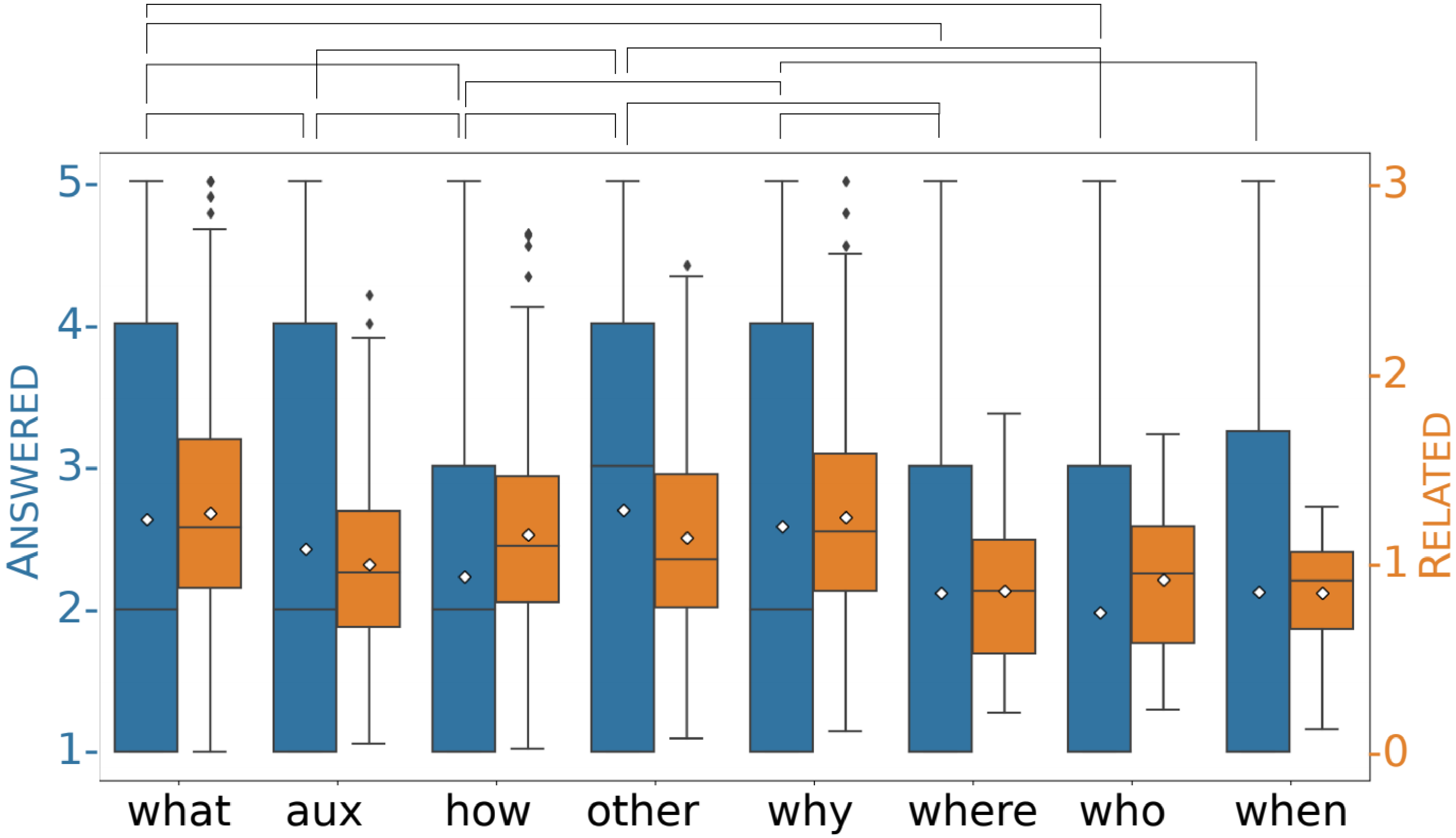




ANSWERED & RELATED per wh-type



ANSWERED & RELATED per wh-type



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