

Asking the Right Question: Inferring Advice-Seeking Intentions from Personal Narratives

Liye Fu et al.

Presenter : Yaman Yu

Background

1. People often share personal experiences to elicit advice from others online.
2. Information retrieval to understand details about the narrator's story
3. Infer the reason why the narrator is sharing the story and all the details. ---- what question is being asked by the narrator?

Personal narrative: I am generally a person who needs a lot of sleep, but today I was not able to sleep more than 6 hours and I am extremely tired. My eyes hurt and two hours later I have programming [lesson] so I have to be alert. I've already drunk a cup of coffee and although I rarely drink coffee, it had no effect on me. I am not at home so I have limited possibilities as for food. I don't want to do anything too unhealthy such as drinking 10 cups of coffee, tho I may consider drinking another one.

Which advice-seeking question is more likely to have been asked by the narrator:

Q1: Is it even possible to be addicted to coffee?

Q2: How can I energize myself?

Example

	Task	Desired output
A	Question generation Reading comprehension Summarization	What do I need to do in 2 hours? I must go for a lesson after getting little sleep.
B	Ending generation Narrative chains, story cloze	Lastly, I tried an energizing drink.
C	Event2Mind Desire fulfillment	to learn to code, to be educated
D	Our task	How can I energize myself?

Research Question

Evaluate the capabilities of automated systems to infer narrator's intention in sharing personal story.

	Task	Desired output
A	Question generation Reading comprehension Summarization	What do I need to do in 2 hours? I must go for a lesson after getting little sleep.
B	Ending generation Narrative chains, story cloze	Lastly, I tried an energizing drink.
C	Event2Mind Desire fulfillment	to learn to code, to be educated
D	Our task	How can I energize myself?

Task Construction

Binary choice cloze test

- Q1:** question which is semantically related to the narrative
- Q2:** question actually asked by the narrator

Masked narrative: I've noticed something, over the past few years I've gained a habit of drinking coffee. The average day is about six cups, but it can exceed that sometimes (8 or so). The only reason I question my habit is cause I'm up at 4AM right now cause I couldn't fall asleep. I honestly have a headache in the morning until I drink a cup of coffee. I'll have some for essentially no reason, I'll just make some out of a urge almost.

-
- Q1:** Is it even possible to be addicted to coffee?
Q2: How can I energize myself?
-

Data construction

Narratives Collection

Dataset of over
415,000 advice-seeking
posts collected from the
subreddit r/Advice

Title: How can I energize myself?

I am generally a person who needs a lot of sleep [...] I don't want to do anything too unhealthy such as drinking 10 cups of coffee, tho I may consider drinking another one.

Help? What has worked for you?

Data construction

Narratives Collection

Diversity of topics in the dataset:

1. singular value decomposition on tf-idf
2. K-means

Selected topics	Question keywords	Example questions
Housing	move live house city apartment roommate	What is it like living with roommates ? Should I move to the city ?
School	college school class degree study	Should I drop out of college ? What's the best way for me to study for my biology tests?
Work	job boss quit work interview employer	Can I somehow ask to work from home? How do I explain during an interview why I left a job ?
Relationships	girl date text tell guy think crush	Does it sound like this girl may like me? How can I think of a better greeting for online dating ?
Personal finances	money car pay rent loan insurance	How do I afford a car in my situation? Am I stupid for wanting a student loan ?
Family	parent convince let mom dad sister	How do I convince my parents to believe me? How can I try and make a better relationship with my sister ?

Table 2: Selected narrative topics and example question keywords associated with each topic.

Data construction

Ground-truth questions

Collection(Q2)

The ?-ending sentences in each post

1. Remove questions have less than 5 words

$$S(q) = S(\{w_1, w_2, \dots, w_N\}) = \max_{i \in N} \text{idf}(w_i).$$

$S(q) < 5$ → Drop the question

Title: How can I energize myself?

I am generally a person who needs a lot of sleep [...] I don't want to do anything too unhealthy such as drinking 10 cups of coffee, tho I may consider drinking another one.

Help? What has worked for you?

Data construction

Alternative questions

Collection(Q1)

For each cloze test narrative:

1. Search a similar narrative
2. Select an advice-seeking question from that narrative as the alternative answer for the test

Masked narrative: I've noticed something, over the past few years I've gained a habit of drinking coffee. The average day is about six cups, but it can exceed that sometimes (8 or so). The only reason I question my habit is cause I'm up at 4AM right now cause I couldn't fall asleep. I honestly have a headache in the morning until I drink a cup of coffee. I'll have some for essentially no reason, I'll just make some out of a urge almost.

Q1: Is it even possible to be addicted to coffee?

Q2: How can I energize myself?

Data construction

Alternative questions

Collection(Q1)

For each cloze test narrative:

$$N_i = \arg \max_i \text{MIN}\{sim(N_i, qn_1), sim(N_i, qn_2)\}$$

- a set of pairs of related narratives (N1, N2)
- respective advice- seeking questions (qn1, qn2)

Masked narrative: I've noticed something, over the past few years I've gained a habit of drinking coffee. The average day is about six cups, but it can exceed that sometimes (8 or so). The only reason I question my habit is cause I'm up at 4AM right now cause I couldn't fall asleep. I honestly have a headache in the morning until I drink a cup of coffee. I'll have some for essentially no reason, I'll just make some out of a urge almost.

Q1: Is it even possible to be addicted to coffee?

Q2: How can I energize myself?

Data construction

Alternative questions

Collection(Q1)

- Discard questions have extremely high or low surface similarity
- 21,865 instances left in the dataset

Masked narrative: I've noticed something, over the past few years I've gained a habit of drinking coffee. The average day is about six cups, but it can exceed that sometimes (8 or so). The only reason I question my habit is cause I'm up at 4AM right now cause I couldn't fall asleep. I honestly have a headache in the morning until I drink a cup of coffee. I'll have some for essentially no reason, I'll just make some out of a urge almost.

Q1: Is it even possible to be addicted to coffee?

Q2: How can I energize myself?

Human Performance

Narrative: I asked a girl that I really like if she would like to get coffee sometime. She said she's really busy but that we'll see. I can't get her off my mind and I spend all day waiting for her to tell me she's free.

Explicitly incompatible (E):

How to deal with my roommate?

Implicitly incompatible (I):

What to do if I asked a girl out and now regret it?

Compatible (C) but unlikely (U):

Which coffee place would you recommend?

Compatible (C) and likely (L):

Would it seem desperate if I asked her again in a more direct way a week later?

Accuracy of identifying ground-truth question out of two candidates: 90%

Explicitly incompatible (E): contain a factual mismatch with the narrative

Implicitly incompatible (I): questions do not contain any factual mismatches but are incompatible with what can be inferred implicitly about events and characters in the story

Compatible (C) but likely (L) or unlikely (U): questions that are neither explicitly nor implicitly incompatible would be labeled as being Compatible, and as either Likely or Unlikely to represent the narrators' intentions.

Human Performance

Pair type	SIM	FT-LM	HUMAN	% in data
C + E	86%	88%	100%	38%
C + {C, I}	68%	74%	89%	46%
C + C	66%	73%	84%	32%
L + {U, I}	75%	75%	100%	30%
OVERALL	76%	80%	90%	

As expected, instances involving only compatible questions (C + C) are harder to solve, only 84% for human performance.

Baseline Performance

Model	Accuracy (held-out)
NARRATIVE-QN-SIM	73.4%
FINETUNED LM	78.7%

Table 5: Performance of different baselines.

- **8,865 - 2,500 train - test dataset**
- **10000 held-out set**
- **Narrative-question similarity:**
the ground-truth question should show greater similarity to narratives.
- **a Fine- tuned Transformer LM model**

Error Analysis

Pair type	SIM	FT-LM	HUMAN	% in data
C + E	86%	88%	100%	38%
C + {C, I}	68%	74%	89%	46%
C + C	66%	73%	84%	32%
L + {U, I}	75%	75%	100%	30%
OVERALL	76%	80%	90%	

These results underline the need for models that can combine common sense reasoning about the events within the story with an intuition about the intention of the narrator.

Error Analysis

Pair type	SIM	FT-LM	HUMAN	% in data
C + E	86%	88%	100%	38%
C + {C, I}	68%	74%	89%	46%
C + C	66%	73%	84%	32%
L + {U, I}	75%	75%	100%	30%
OVERALL	76%	80%	90%	

Compare words used in ground-truth questions that the best-performing model predicts correctly with those used in questions that are classified incorrectly.

Conclusion

1. This work formulate the task of inferring advice-seeking intents from personal narratives
2. Develop a methodology to construct a large dataset of personal narratives matched with plausible options for advice-seeking questions (the ASQ dataset)
3. Analyze the human and baseline performance on different types of test instances points to interesting avenues for future work

Future Work

- **Query/question intents:** To complement this line of work that looks at user intents behind the explicit request, this task aims to uncover user intents when they are implied in personal narratives (without access to the explicit question)
- **Conversational search/QA:** Could be used to understand user intents in conversational question answering like chatbot.
- **Social QA:** Could be used to help improve the question answering with more social context.

Thank you!