

Computational Humor

王省 2021.10.27

目录

Content

1. Background
2. Humor Dataset
3. Humor Recognition
4. Humor Generation
5. Conclusion



Background

What Makes a Joke Funny?

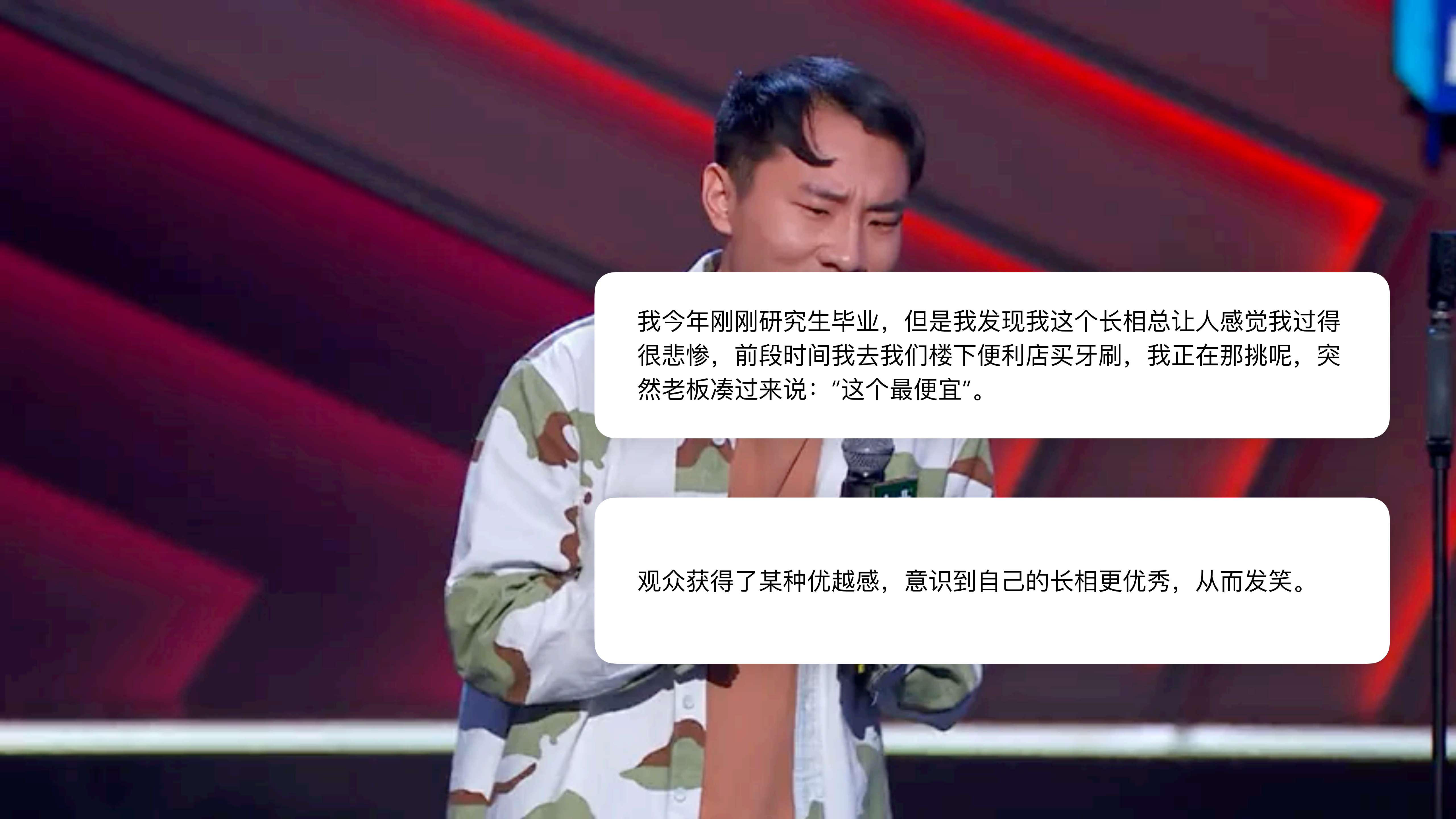
three classic theories of humor

- Superiority Theory (优越论)
- Relief Theory (释放论)
- Incongruity Theory (不一致论或矛盾论)

Theories of Humor

Superiority Theory

- 认为幽默源于一种突如其来的胜利感，或者是意识到对别人的优越感。

A man with dark hair, wearing a white shirt with a green and brown camouflage pattern, is on a stage. He has a pained or cringing expression on his face, with his eyes squeezed shut. The background is dark with prominent red diagonal light beams. A microphone is visible in front of him.

我今年刚刚研究生毕业，但是我发现我这个长相总让人感觉我过得很悲惨，前段时间我去我们楼下便利店买牙刷，我正在那挑呢，突然老板凑过来说：“这个最便宜”。

观众获得了某种优越感，意识到自己的长相更优秀，从而发笑。

Theories of Humor

Relief Theory

- 从情绪的角度理解幽默。
- 认为人们之所以意识到是幽默并发笑, 是因为人通过后天教育和社会影响所形成的情绪和心理压抑在幽默世界里得到了释放。

一个人在大街上大骂：“赫鲁晓夫是个白痴。”。结果被判刑22年。
2年是因为：辱骂国家领导人
20年是因为：泄露国家机密

A woman with dark hair is speaking into a microphone on a stage. Behind her, a group of people are seated on a raised platform, watching the performance. The stage is lit with blue and red lights, and there are decorative elements like a large blue pillar and a red staircase in the background.

你永远不知道一个男的如果生活过的不如意的时候会变得多么的丧心病狂、多么的歇斯底里、莫名其妙、无理取闹，简单来说，就是跟女的一样。

笑话中带有侮辱，这种侮辱能够引起一种攻击性冲动，从而使得观众发笑。

再勇敢下去就是鲁莽了

脱口秀大会

ROCK & ROAST

Theories of Humor

Incongruity Theory

- 认为幽默来源于人们对故事的预期与故事结局的不一致，来源于人们对违背期望的不协调事物的感知。
- 弱化了“动机”的作用，强调了对幽默的认知过程是一种对外部刺激事件的感知和解释。



“你看你，才离开我几天就变成这个鬼样子，你脸都变大了。”

expected follow-up

肯定/否定

“那是一面镜子哦。”

expected violated

Linguistics Research on Humor

- Semantic Script-Based Theory of Humor (SSTH)
- General Theory of Verbal Humor (GTVH)
- Related Work in Linguistics

Linguistics Research on Humor

Semantic Script-Based Theory of Humor (SSTH)

- A joke is consisting of a set-up and a punchline

Linguistics Research on Humor

Semantic Script-Based Theory of Humor (SSTH)

- A joke is consisting of a set-up and a punchline

Set-up

“你看你，才离开我几天就变成这个鬼样子，你脸都变大了。”

Punchline

“那是一面镜子哦。”

Linguistics Research on Humor

Semantic Script-Based Theory of Humor (SSTH)

- A joke is consisting of a set-up and a punchline
- two necessary and sufficient conditions:
 - the humorous text has to be compatible with at least two different interpretations (scripts).
 - the two interpretations have to be opposed to each other.

Linguistics Research on Humor

General Theory of Verbal Humor (GTVH)

- Script opposition: a knowledge source based on the main idea of SSTH of opposing interpretations that are both compatible with the text.
- Logical mechanism: provides a possible resolution mechanism for the incongruity between scripts.
- Situation: defines the context of the joke in terms of location, participants, and others.
- Target: is the person or group of persons that are targeted by the joke.
- Narrative strategy: defines the style of the joke, i.e. whether it is a dialogue, a riddle, or a simple narrative.
- Language: defines the “surface” of the joke in terms of linguistic aspects. such as lexicon, morphology, syntax, semantics.

Linguistics Research on Humor

Related Work in Linguistics

- the lexical devices.
 - syntactic ambiguity
 - three main types of ambiguity:
 - lexical (e.g. "I used to be a banker but I lost **interest**.")
 - syntactic (e.g. "The chicken is ready to eat. ")
 - phonological (e.g. ""Yesterday I accidentally swallowed some food coloring. The doctor says I'm OK, but I feel like I've ____ (died/dyed) a little inside.")

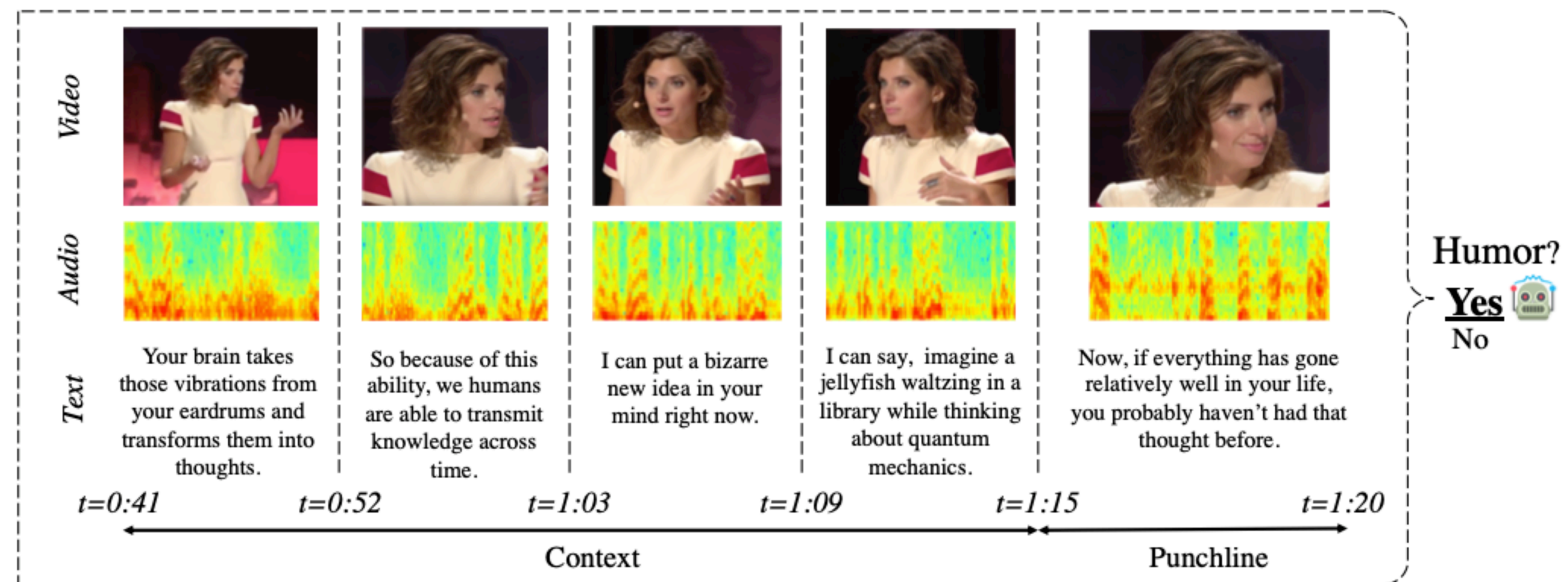
Multidisciplinary Research on Humor

- Sociology: communication, gender, culture, ...
- Psychology: individual development, personality profiles, ...
- Neuroscience: the brain activity, ...

Humor Dataset

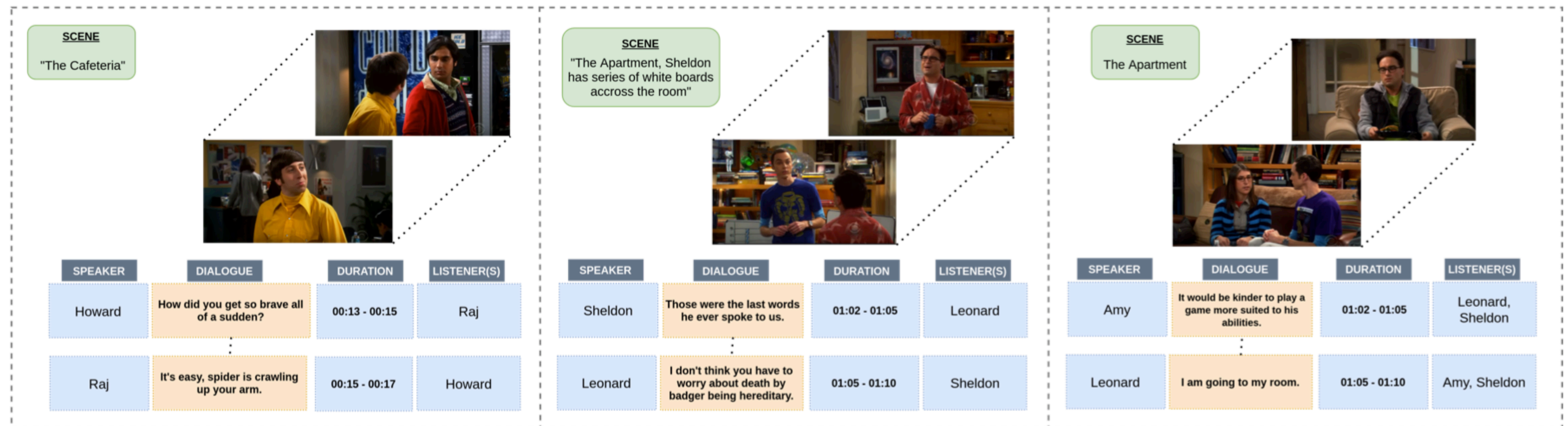
Multimodal Datasets

- UR-FUNNY [1]
 - including text, visual and acoustic modalities
 - use the audience's laughter as annotation.
 - 16514 data From TED talks



Multimodal Datasets

- MHD [1]:
 - “The Big Bang Theory”
 - Scenes, Speakers, dialogues, Start-Times, End-Times, Listeners, etc



Humor Headlines

- Humicroedit [1]
- A dataset of 15,095 headlines with simple edits designed to make them funny.

Original Headline	Humorous Edit
Meet the wealthy donors pouring millions into the 2018 elections 捐赠者	Meet the wealthy sadists pouring millions into the 2018 elections 虐待狂
Trump has the upper hand in North Korea talks	Trump has the upper hand in North Korea handshakes
Manhattan DA reportedly dropped felony fraud case against Trump's kids after donation from Trump's lawyer 律师	Manhattan DA reportedly dropped felony fraud case against Trump's kids after donation from Trump's doppelganger 分身

Table 1: Example instances of the Humicroedit dataset, containing the original headline and a humorous edited version. Edited phrase is in bold. Note that the edited headlines are designed to be humorous in light of the original.

[1] Nabil Hossain. et. al. "President Vows to Cut Taxes Hair": Dataset and Analysis of Creative Text Editing for Humorous Headlines. NAACL. 2019.

Jokes

One-liner Joke

- the 16000 One-Liner dataset [1]
 - Humorous data set: one-liners collected from the Web.
 - Negative data sets:
 - Reuters news titles;
 - Proverbs;
 - British National Corpus (BNC).

<i>One-liners</i>
Take my advice; I don't use it anyway. I get enough exercise just pushing my luck. Beauty is in the eye of the beer holder.
<i>Reuters titles</i>
Trocadero expects tripling of revenues. Silver fixes at two-month high, but gold lags. Oil prices slip as refiners shop for bargains.
<i>BNC sentences</i>
They were like spirits, and I loved them. I wonder if there is some contradiction here. The train arrives three minutes early.
<i>Proverbs</i>
Creativity is more important than knowledge. Beauty is in the eye of the beholder. I believe no tales from an enemy's tongue.

Table 1: Sample examples of one-liners, Reuters titles, BNC sentences, and proverbs.

Pun

"A pun is a form of wordplay in which one sign (e.g., a word or phrase) suggests two or more meanings by exploiting polysemy, homonymy, or phono- logical similarity to another sign, for an intended humorous or rhetorical effect. " 1

Puns

- SemEval-2017 task 7 [1]:
 - 3 Subtasks: detection, location, interpretation
 - Heterographic (异声异义)
 - Homographic (同声异义) *

(1) When the church bought gas for their annual barbecue, proceeds went from the sacred to the **propane** (profane).
(2) I used to be a banker but I lost **interest**.

pun type	subtask	contexts	words
homographic	detection	2 250	24 499
homographic	location	1 607	18 998
homographic	interpretation	1 298	15 510
heterographic	detection	1 780	19 461
heterographic	location	1 271	15 145
heterographic	interpretation	1 098	13 258

Crosstalks

- (未发布数据集) Shaking Du, Towards Automatic Generation of Entertaining Dialogues in Chinese Crosstalks, 2017
- published books; websites; records of crosstalk play
- 173, 000 pairs of utterances, from 1, 551 excerpts of crosstalks.

A: 楚国大夫屈原，五月初五死的，我们应该永远怀念屈原。要是没有屈原，我们怎么能有这三天假期呢？
The mid-autumn festival is in memory of Qu Yuan. We should keep him in mind forever, because his death brings us this 3-day holiday.

B: 这个，代价大点儿。
It costs him a lot (to have a holiday).

A: 我觉得应该再多放几天假。
I think it would be better with more holidays.

B: 那得死多少人啊。
How many people would die then!

Crosstalks

- 从网站、书籍收集共4044段相声。
- 包含了传统、校园、经典等各方面相声。
- 其中单口相声449段，对口相声3087段，群口相声472段。

Humor Recognition

Features

- Diyi Yang. et.al. Humor Recognition and Humor Anchor Extraction, EMNLP, 2015
 - Incongruity
 - Ambiguity
 - Interpersonal Effect
 - Phonetic Style

Features

- Yubo Xie. et.al. Uncertainty and Surprisal Jointly Deliver the Punchline: Exploiting Incongruity-Based Features for Humor Recognition, IJCNLP, 2021
 - Uncertainty
 - Surprisal

Humor Generation

Generation Task

- Joke generation:
 - Given the set-up, generate the punchline.
 - Given the leading comedian (逗哏), generate the supporting role (捧哏).
- Translate: Translate a regular sentence to humor.
- Pun generation: Given a pair of word senses, generate a pun.

Model

- GANs
- Encoder-Decoder

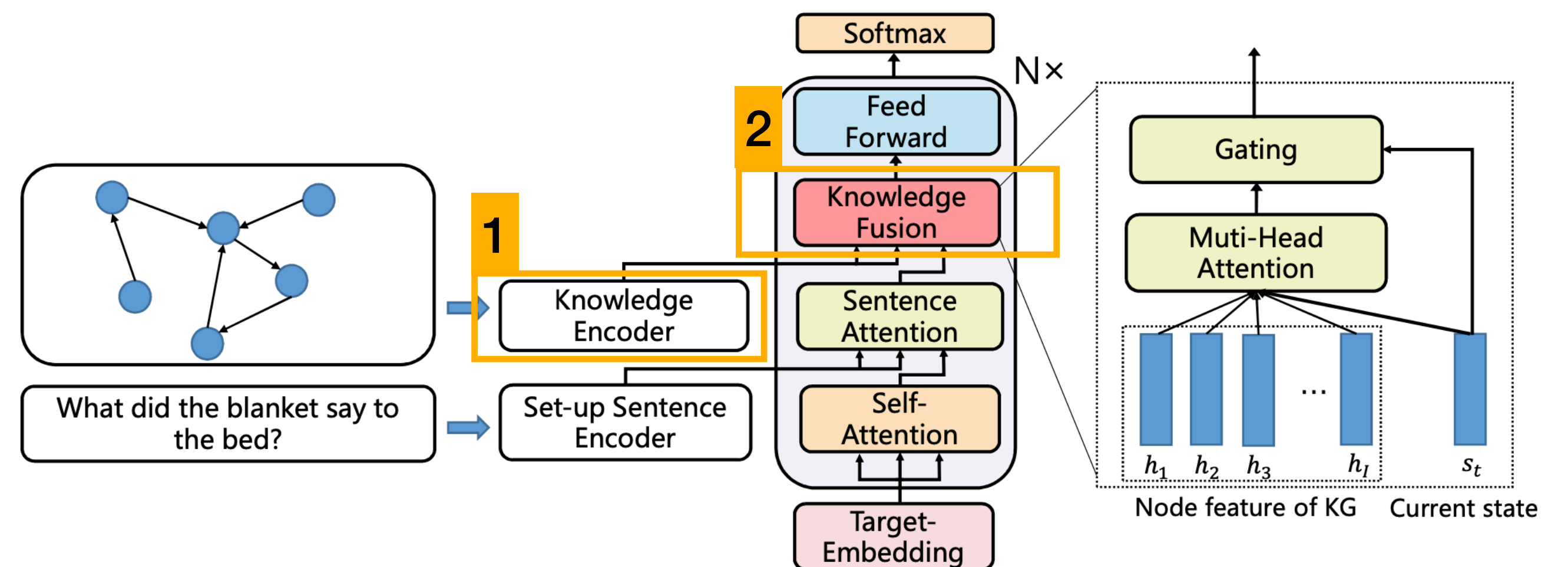
Evaluation

- Auto Evaluation
- Human Evaluation:
 - Grammar and fluency/Readability;
 - Coherency/Relevance;
 - Funniness/Entertainment.

Joke Generation

Given the set-up, generate the punchline

- Zhang, Hang. et al. "Let's be Humorous: Knowledge Enhanced Humor Generation." ACL. 2020.
- Background knowledge is crucial in understanding and generating jokes.
- Propose a framework to Generate punchline with the set-up and relevant knowledge.



Joke Generation

Given the set-up, generate the punchline

- 谭红叶. et.al. 迈向创造性语言生成: 汉语幽默自动生成的探索. 中国科学: 信息科学. 2018
- 在生成对抗网络方法中融入了歧义性、不一致性、语音相似性、普遍性等笑话属性特征来评价、指导笑话的生成。

Joke Generation

Given the leading comedian (逗哏), generate the supporting role (捧哏)

- Shikang Du. et. al. Towards Automatic Generation of Entertaining Dialogues in Chinese Crosstalks. arxiv. 2017.
- Propose a humor-enhanced translation model.

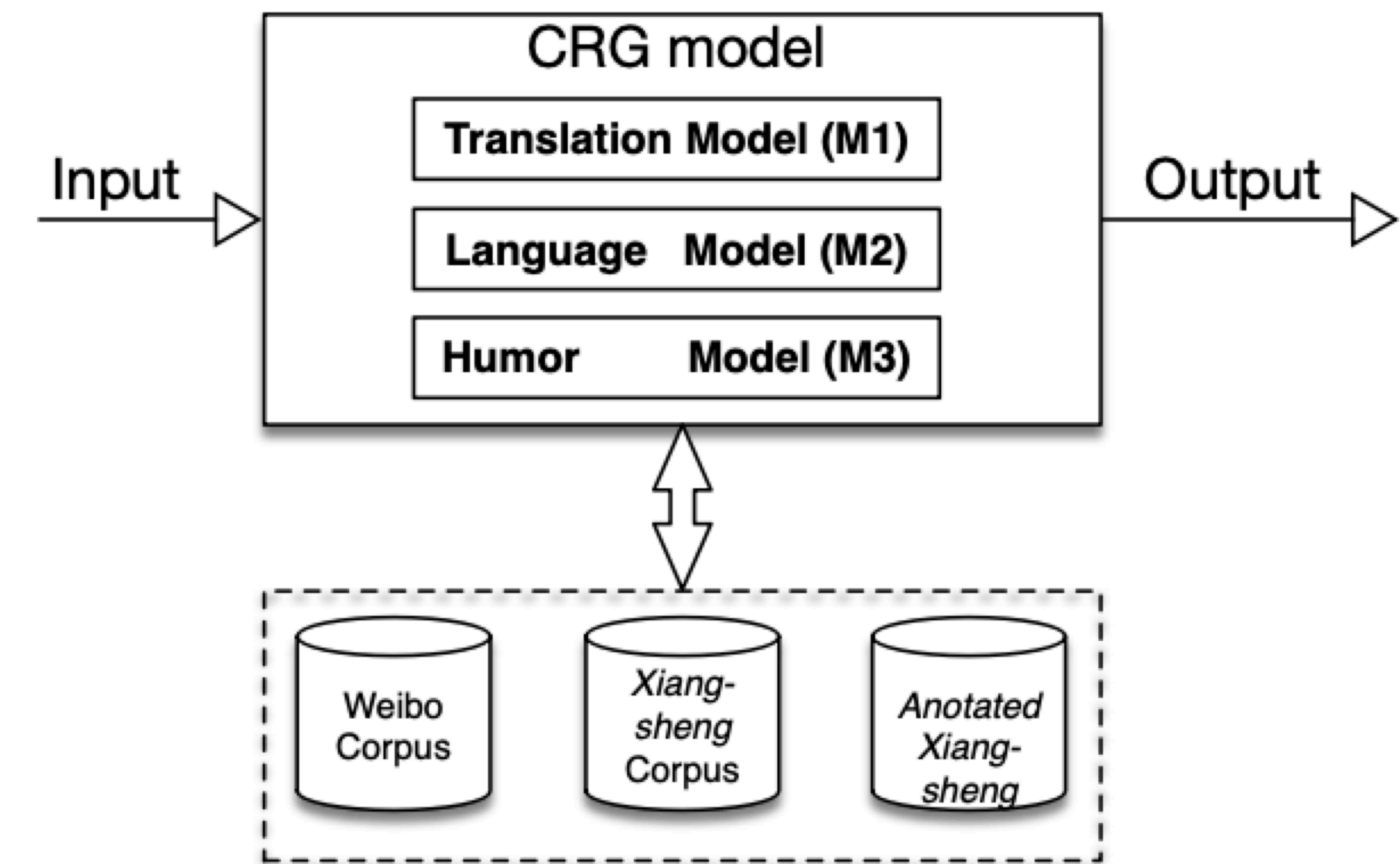


Figure 1: General architecture of our system

Translate

Translate a regular sentence to humor

- Orion Weller. et.al. Can Humor Prediction Datasets be used for Humor Generation? Humorous Headline Generation via Style Transfer. ACL. 2020.
- Propose an encoder-decoder architecture to translate headlines from regular to humorous English.

Pun Generation

Given a pair of word senses, generate a pun

- Fuli Luo. et. al. Pun-GAN: Generative Adversarial Network for Pun Generation. EMNLP, 2019.
- propose an adversarial generative network for pun generation (Pun-GAN).
- Model: GANs with reward

Pun Generation

Given a pair of word senses, generate a pun

- He, He. et.al. Pun Generation with Surprise. NAACL. 2019.

- Propose an approach to generate a pun.

- “local-global surprisal principle”

- a strong association between the alternative word and the local context;
- a strong association between the pun word and the distant context;
- both words should be interpretable given local and global context to maintain ambiguity.

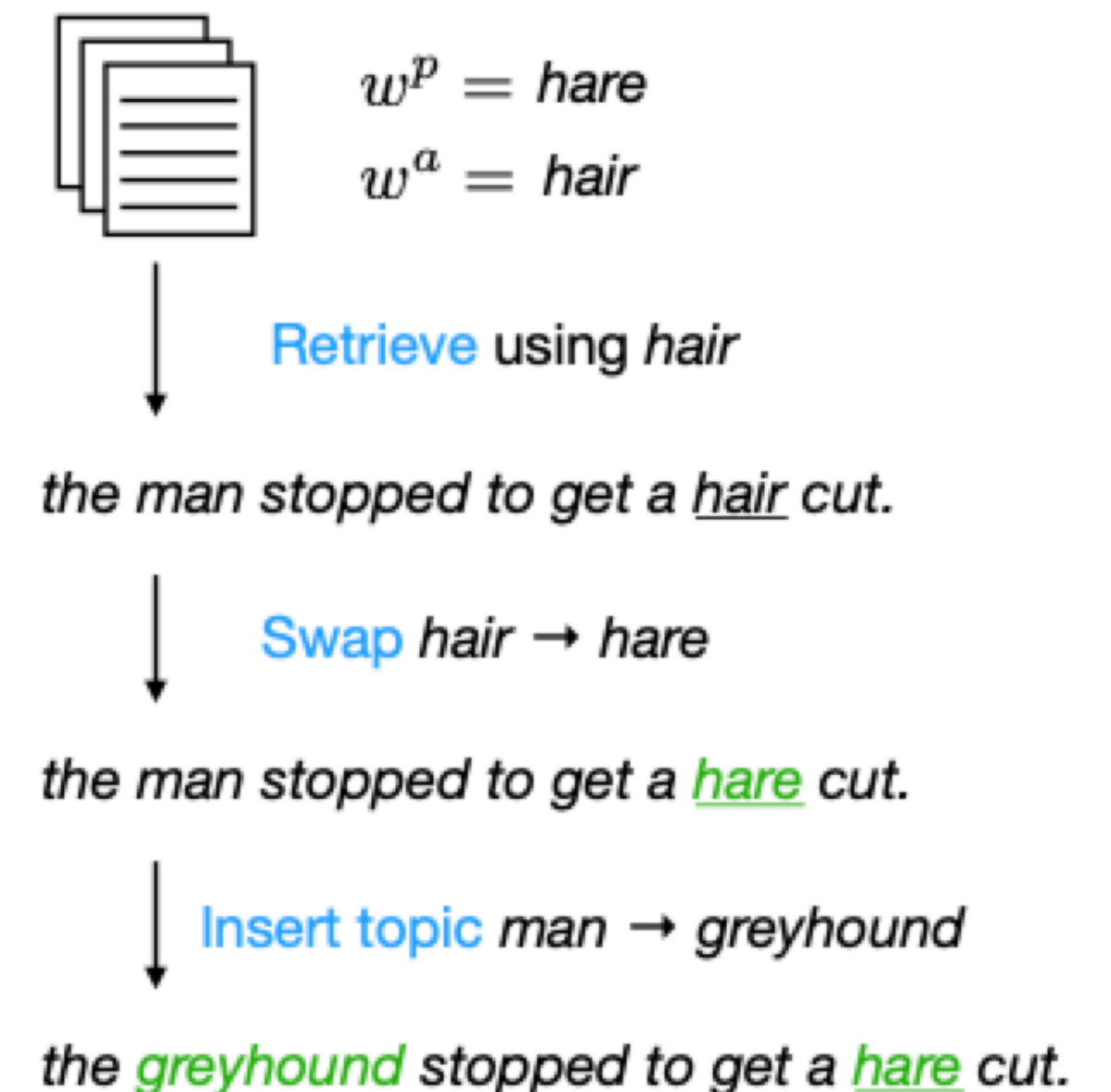


Figure 2: Overview of our pun generation approach. Given a pair of pun/alternative word, we first retrieve sentences containing w^a from a generic corpus. Next, w^a is replaced by w^p to increase local surprisal. Lastly, we insert a topic word at the beginning of the sentence to create global associations supporting w^p and decrease global surprisal.

Conclusion