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“YEAH RIGHT”

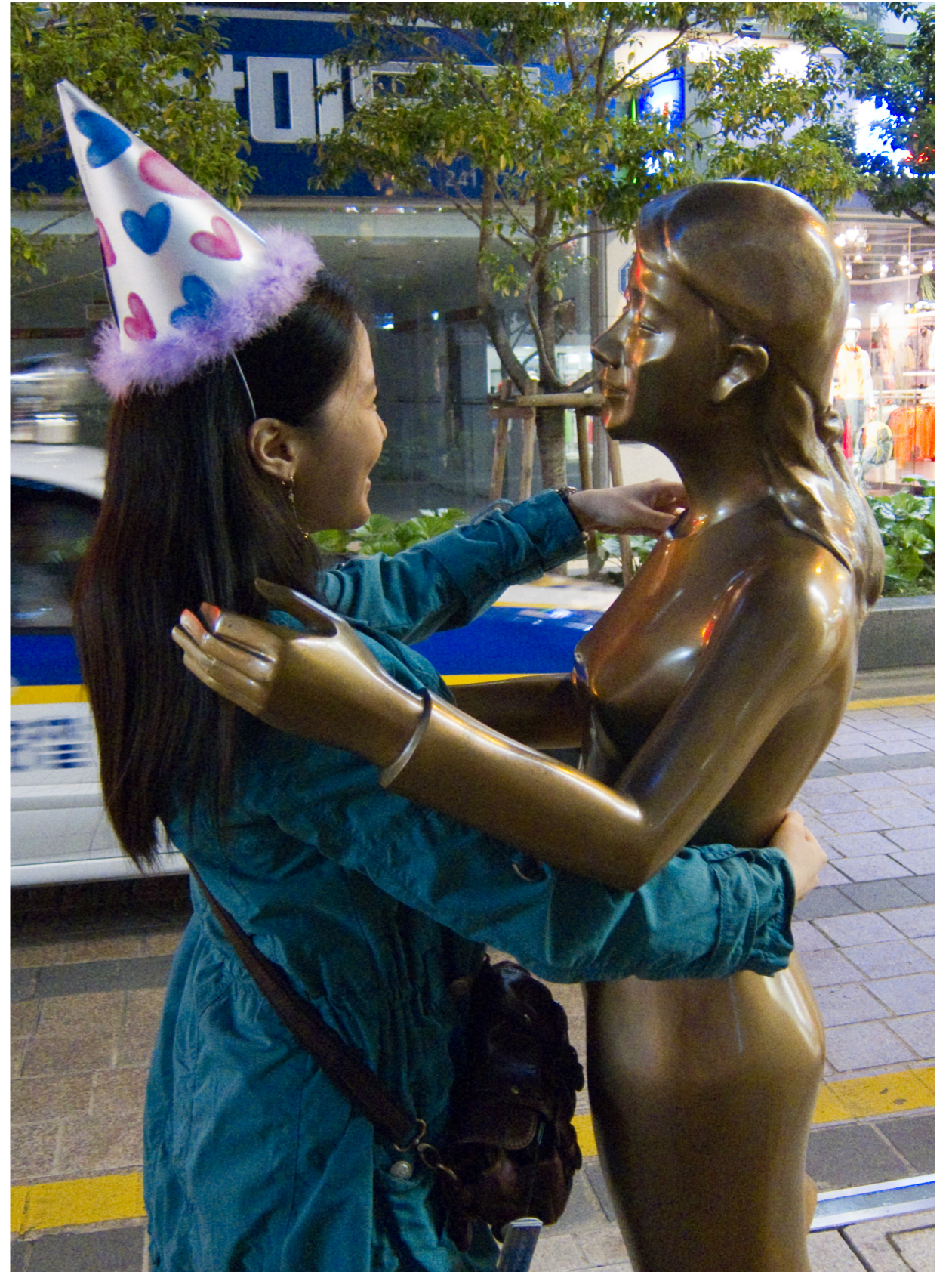
SARCASM RECOGNITION FOR SPOKEN DIALOGUE SYSTEMS

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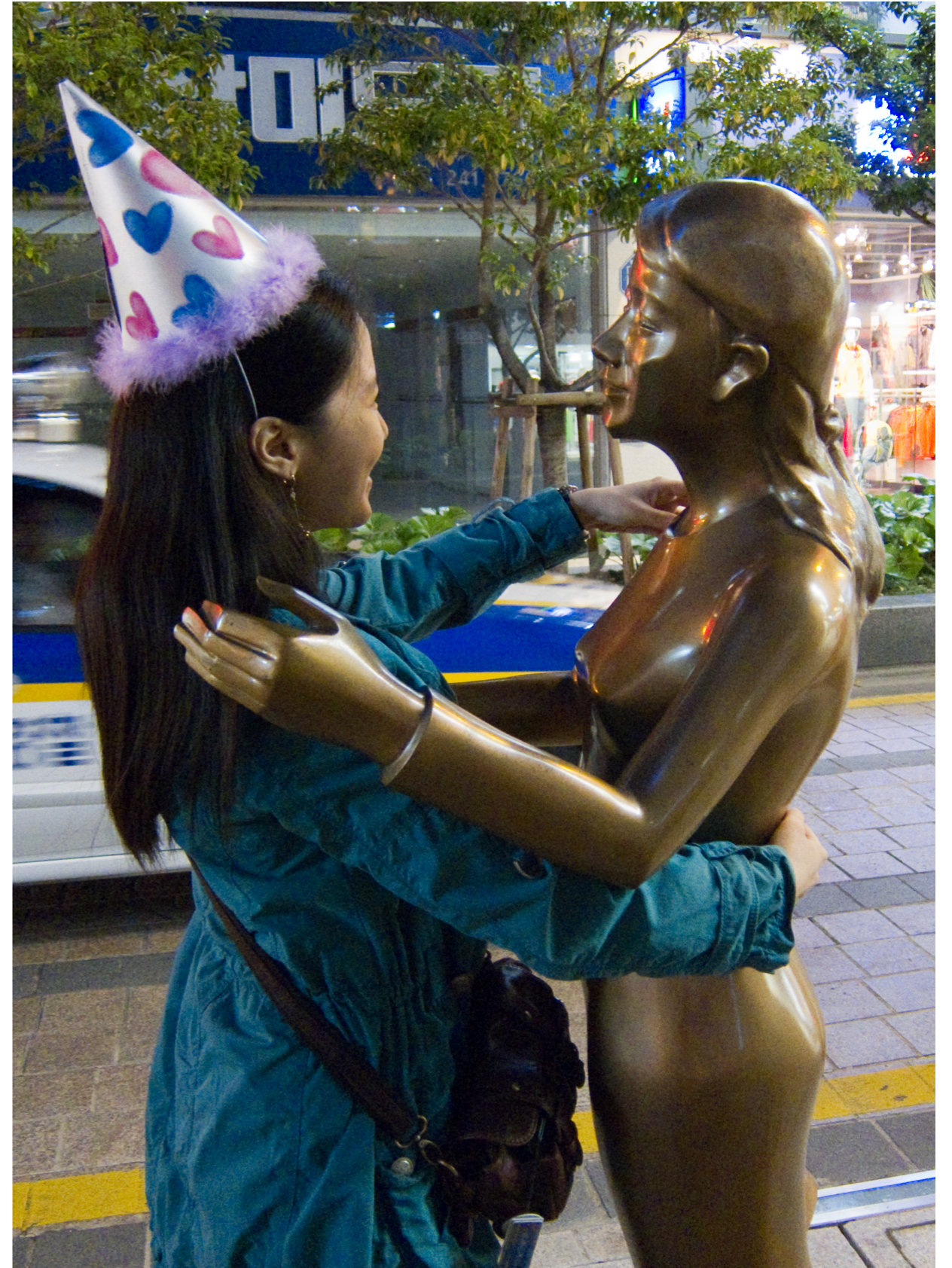


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GREAT DANCER!



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~~GREAT DANCER!~~

...

...

...

“YEAH RIGHT!”



What is a Sarcasm?

Semantic
Interpretation

Sarcasm

Literal
Meaning



What is a Sarcasm?

Semantic Interpretation

Literal Meaning

Sarcasm

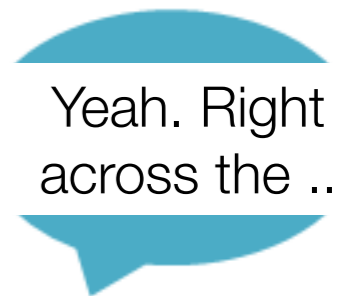
Why

Complex semantic nature

Violates Grice's maxim

Frequent appearance

Important



Which “Yeah Right” is it?



Which “Yeah Right” is it?



Which “Yeah Right” is it?

Goal: Train an automatic sarcasm recognizer using spectral, contextual, and prosodic cues.

Questions they wanted to answer...

- ✓ Best feature to detect sarcasm

What types of features are most indicative of sarcasm's presence?

- ✓ Formulation

How sarcasm functions as a speech act?

- ✓ Recommend suitable followup action

How should a dialogue manager respond to sarcasm once detected?

Which “Yeah Right” ?

✓ Categorization

I. Acknowledgement

When a speaker uses a sincere “yeah right” by way of presenting evidence of **understanding**



A: Oh, well that’s right near Piedmont.
B: Yeah right, right...

Which “Yeah Right” ?

✓ Categorization

1. Acknowledgement

When a speaker uses a sincere “yeah right” by way of presenting evidence of **understanding**

2. Agreement / Disagreement

Self explanatory--indicating the speaker “**agrees**” to something.



A: A thorn in my side: bureaucraties.
B: Yeah right, I agree.

YEAH

RIGHT ON

Which “Yeah Right” ?

✓ Categorization

1. Acknowledgement

When a speaker uses a sincere “yeah right” by way of presenting evidence of **understanding**

2. Agreement / Disagreement

Self explanatory--indicating the speaker “**agrees**” to something.

3. Indirect Interpretation

Type of speech act not directed at the dialogue partner but at a hearer not present as in recounting a past use of sarcastic “yeah right”

A: “...We have too many pets!” I thought, “Yeah right, come tell me about it!” You know?

B: [laughter]

(3)

Yeah! Right,



Very Funny!

Which “Yeah Right” ?

✓ Categorization

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Self explanatory--indicating the speaker “**agrees**” to something.

3. Indirect Interpretation

Type of speech act not directed at the dialogue partner but at a hearer not present as in recounting a past use of **sarcastic** “yeah right”

4. Phrase Internal

“Yeah right” is not a singular speech unit itself, but is included **as part of** some larger speech act.

Yeah... Right there



Between those molars

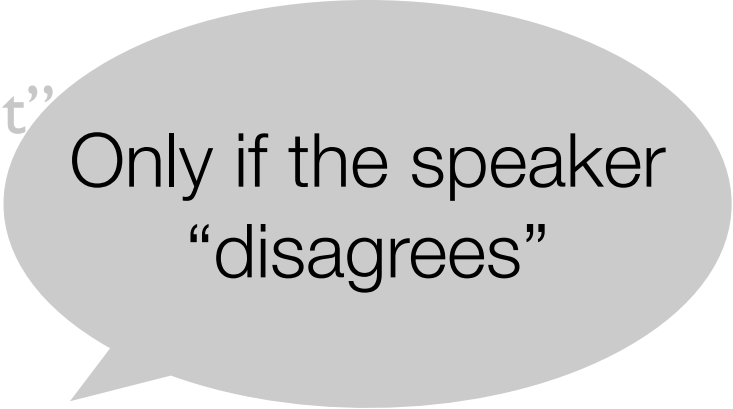
So.. which “yeah right” is sarcastic?

Which “Yeah Right” ?

✓ Categorization

1. Acknowledgement

When a speaker uses a sincere “yeah right”
evidence of **understanding**



Only if the speaker
“disagrees”

✓ 2. Agreement / Disagreement

Self explanatory--indicating the speaker “**agrees**” to something.

✓ 3. Indirect Interpretation

Type of speech act not directed at the dialogue partner but at a hearer not present as in recounting a past use of **sarcastic** “yeah right”

4. Phrase Internal

“Yeah right” is not a singular speech unit itself, but is included **as part of** some larger speech act.

Yeah! Right,



Very Funny!

How did they do it?

Objective Cues

✓ Feature sets used to mark “sarcasm”

1. Laughter

Sarcasm is often humorous

2. Question / Answer

“Yeah right” for answering a question is correlated with sincerity

3. Start / End

Sarcastic “yeah right” usually comes after some elaboration of the joke

4. Pause

If “yeah right” is preceded or followed by a pause, it’s not likely to be sarcastic

5. Gender

Men are often more sarcastic than women

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Q. Isn't it possible to convert almost all preceding clause of "yeah right" into a question form? If yes, why would Question/Answer form indicate higher possibility for non-sarcastic "yeah right"?

- Q. Isn't it possible to convert almost all preceding clause of "yeah right" into a question form? If yes, why would Question/Answer form indicate higher possibility for non-sarcastic "yeah right"?
- Q. Statistically men uses more sarcasm than women.
Statistically Asian countries use less sarcasm than America.
>> Can we detect different regional accents to identify where the speaker's background culture is in order to improve accuracy in detecting sarcasm?

✓ Prosodic and spectral features

1, 2: Average pitch in “yeah” and “right” individually, normalized by the average pitch over the whole utterance

3, 4: Duration of each word, normalized by the utterance’s duration

5, 6: Average energy in each word, normalized by the average energy of the utterance

7, 8, 9, 10: The number of rising and falling frames (positive and negative pitch slopes) in each word, normalized by the total frames in that word

11, 12: The number of inter-frame changes from rising to falling pitch slope within each word, also normalized by the number of frames in that word

13, 14: The overall pitch slope from the first to last frame of each word, normalized by the whole utterance’s overall pitch range

15: The overall pitch slope of the whole utterance, normalized by the whole utterance’s pitch range

16, 17: The pitch range for each word, normalized by the pitch range of the whole utterance

18, 19: The energy range for each word, normalized by the energy range of the whole utterance

Annotation

- ✓ “Yeah right” with / without the surrounding context
- ✓ 2 Human labelers annotated data
 - **WITHOUT** the surrounding context :
Inter annotator agreement was **VERY LOW!**
53.73% agreement (chance agreement of 43.93%)
Kappa statistics of 0.1569

Why such a low agreement? Is it really that difficult?



Let's try it!



Let's try it! - Positive or Negative?

“Yeah”

Male 4

Female 3

“Absolutely”

Male 4

Female 2

“Exactly”

Male 5

Female 4

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- ✓ 2 Human labelers annotated data
 - **WITHOUT** the surrounding context :
Inter annotator agreement was **VERY LOW!**
53.73% agreement (chance agreement of 43.93%)
Kappa statistics of 0.1569
 - **WITH** the surrounding context :
Inter annotator agreement was fair (still somewhat low)
76.67% agreement (chance agreement of 66%)
Kappa statistics of 0.313
- ✓ Any disagreements between the two annotators were resolved and the labels were taken as true classes

How did annotators resolve disagreement?



- ✓ 131 instances of “yeah right” in Switchboard & Fisher
- ✓ 30 instances of **sarcastic** “yeah right” (23%)
- ✓ Presence of laughter seem to be a valid identifier
 - Sincere “yeah right”: 22% with laughter
 - Sarcastic “yeah right”: 73% with laughter
- ✓ No confirmation that men use sarcasm more often than women does

	<i>F-measure</i>	<i>accuracy</i>
<i>prosodic</i>	0.00	0.69
<i>spectral</i>	0.35	0.77
<i>contextual</i>	0.52	0.84
<i>prosodic + spectral</i>	0.43	0.76
<i>prosodic + contextual</i>	0.46	0.77
<i>contextual + spectral</i>	0.70	0.87
<i>all 3</i>	0.68	0.86

Table 2. Classification results, sorted by feature set.

Questions they wanted to answer...

✓ Best feature to detect sarcasm

What types of features are most indicative of sarcasm's presence?

- Ignore prosodic features, focus on contextual features

✓ Formulation

How sarcasm functions as a speech act?

- Couldn't find the answer...

✓ Recommend suitable followup action

How should a dialogue manager respond to sarcasm once detected?

- Either generate synthetic laughter or point out that it gets the joke