Analysis of Laughter in Meetings (2007)

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HAHA – true laughter

Haha – “What you said is somewhat humorous.”

Ha – A for effort, deserving of a pity laugh.

Silence – Not at all funny, nor deserving of your pity.

Introduction

- Goal: study laughter in a group setting
- Answer 3 main ideas:
  - 1. Quantity of laughter vs speech
  - 2. Duration of laughter vs speech
  - 3. Participants' influence on each other's laughing/speaking

Features about Laughter

- Different from speech
- Contagious
- Varies from person to person
- Not defined lexically in this project
- Can laughter predict emotion?

Defining Laughter and Speech

- *Call* – a single “ha” in laughter
- *Bout* – a group of “ha” in laughter
- *Spurt* – region of speech uninterrupted by pauses

- Laughter and speech are binary, either on or off
- No concurrent actions in this project

Data & Corpus

- ICSI Meeting Corpus
- 75 unscripted, natural meetings
- 3-9 participants per meeting
- Participants each wear a microphone
- One “overall” microphone
- 13 female, 40 male

Common Sounds in the Corpus

Freq Rank	Token Count	VocalSound Description	Used here
1	11515	laugh	√
2	7091	breath	
3	4589	inbreath	
4	2223	mouth	
5	970	breath-laugh	√
11	97	laugh-breath	√
46	6	cough-laugh	√
63	3	laugh, "hmmph"	√
69	3	breath while smiling	
75	2	very long laugh	√

*each item is called a *comment*

The Vocalsound

- A ***vocalsound*** is a discretized event of sound by a speaker
- Corpus contains:
  - 12,635 vocalsounds
  - Subtract 65 “bad ones”
  - Add 1108 known instances of laughter
  - = **13678** vocalsounds

Data Preprocessing

- Speech labeled for each speaker
- Segmented dialogues into:
  - 1. talk spurts (like a full utterance)
  - 2. laugh bouts (a discretized section of laughter)
- “Read” speech is excluded
- ~66.3 hours of speech

Determining Spurts of Talking

- Programmatically calculated
- Top sounds in the corpus, plucked out laugh-related:
  - 1. Laugh (rank 1)
  - 2. Breath-laugh (rank 5)
  - 3. Laugh-breath (rank 11)
  - 4. Cough-laugh (rank 46)
  - 5. Laugh, “hmmph” (rank 63)
  - 6. Very long laugh (rank 75)
- Why segment speech into talking spurts anyway?

Determining Bouts of Laughter

- Knowledge of talking spurts helps!
- If it's not a spurt of talking, it's probably laughter

Stats!

- 87% of vocalsounds are laughter
- Remaining 13% were labeled by hand (took 18 hours)

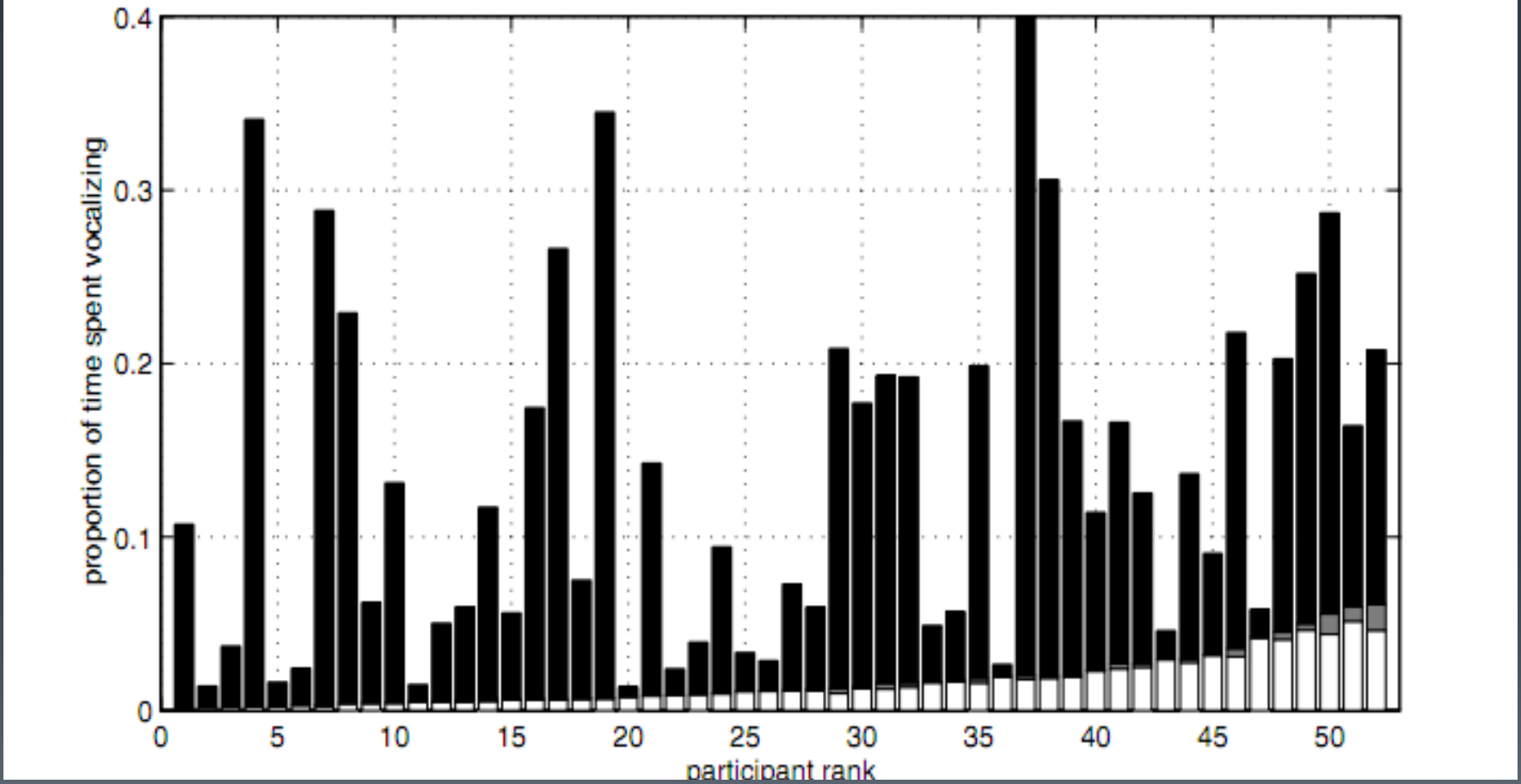
Question 1, Explained

- What is the quantity of laughter, relative to the quantity of speech?
  - Average person vocalizes for 14.8% of the meeting
  - 8.6% of the 14.8% is laughing
  - .08% of the 14.8% if laugh-talking

Question 2, explained

- How does the durational distribution of episodes of laughter differ from that of episodes of speech?
  - One person laughs every ~46 seconds
  - “Island bouts” occur within 4.6s of the first person having laughed

Talking vs Laughing vs Both



Black=talking, white=laughing, gray=laugh-talking

Question 3, Explained

- How do meeting participants affect each other in their use of laughter, relative to their use of speech?
  - 8.1% of speech is overlap
  - 39.7% of laughter is overlap
  - Usually laughter and speech overlap together
  - If majority of people are vocalizing, it's laughter
  - More overlap = more likely to be laughter!

Discussions Questions

1. How can this data about overlapping be helping in predicting emotions?
2. How can this data be used to *detect* laughter in future projects?
3. What is the downside of only looking at overlap?
4. If there is little overlap, is there little laughter?
5. Could laughter be used as a predictor of emotions other than happiness?
6. Does laughter vary across cultures? Genders? Animals?