Objective: Explore the differences in representation and treatment between women and men in French medias

Role of the LIUM: Enriched Speech Transcription and Sound Characteristics Study

Automatic detection of manerrupting
DEFINITIONS

Definitions

**Manterrupting**: Unnecessary interruption of a woman by a man

**Interruption**: Something that causes a stoppage in the continuity of something

**Overlap**: Speech segment with at least two concurrent speakers

**Gender**: Binary definition with Female and Male

**OSD**: Overlapped speech detector

**GD**: Gender detector from voice

Previous works

- Zimmerman, D., West, C., (1975) “Sex roles, interruptions and silences in conversations”, in Language and Sex: Difference and Dominance

- Adda-Decker et al. (2008) “Annotation and analysis of overlapping
PROBLEMATIC

Manterrupting
Activist term
PROBLEMATIC

**Manerrupting**
Activist term

**Gender**

**Unnecessary**

**Interruption**
Social sciences
PROBLEMATIC

Manerrupting
Activist term

gender
unnecessary

Interruption
Social sciences

subjectivity

Overlap
Measurable value

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PROBLEMATIC

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PROBLEMATIC

- Manterrupting
  - Activist term
  - Gender
  - Necessary
- Interruption
  - Social sciences
  - Subjectivity
- Overlap
  - Measurable value
  - OSD
  - Predict

- Manterrupting
  - Activist term
  - Social Sciences

- Interruption
  - Social sciences

Manual annotation
PROBLEMATIC

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PROBLEMATIC

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Social sciences

**Overlap**
Measurable value

**Annotated data**

**Manual annotation**

**GD**

**OSD**

**Overlap according to gender**

- Subjectivity
- Gender
- Unnecessary
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Overlap according to gender

Annotated data
| Corpus                | Overlap timestamps | Overlap transcription | Gender           |
|----------------------|--------------------|-----------------------|------------------|
| Ester1(Galliano 2004) | ✓                  | ✓                     | ✓                |
| Ester2(Galliano 2009) | ✓                  | ✓                     | Mostly           |
| Epac(Galliano 2006)   | ✓                  | ✓                     | ✓                |
| Etape(Gravier 2012)   | Not always         | ✓ + Overlap types     | Mostly           |
| Repere(Giraudel 2012) | ✓                  | Not always            | ✓                |
| AMI(Mccowan 2005)     | ✓                  | X                     | X                |
| Dihard(Ryant 2021)    | ✓                  | X                     | X                |

+ ALLIES : Metacorpus {Ester1,Ester2,Epac,Etape,Repere}
There is a huge disparity in the duration repartition of overlap between the different types of corpora.

Train an overlapped speech detection system on AMI or DIHARD wont be adequate to use it on broadcast news.
| Corpus   | Total duration | Overlap proportion | Language |
|----------|----------------|--------------------|----------|
| ESTER1   | 99h            | 0.67%              | fr       |
| ESTER2   | 161h           | 0.67%              | fr       |
| EPAC     | 105h           | 5.29%              | fr       |
| ETAPE    | 34h            | 1.11%              | fr       |
| REPERE   | 58h            | 3.36%              | fr       |
| DIHARD   | 34h            | 11.6%              | en       |
| AMI      | 96h            | 13.87%             | en       |

Total duration and proportion of overlaps duration for different speech corpora.

**Conclusions**

- We can observe the three category of content: Broadcast news, Debates, Spontaneous speech
STATISTICAL STUDY - GENDER

| Corpus  | Female | Male   | Non specified proportion | Recording period |
|---------|--------|--------|---------------------------|------------------|
| ESTER1  | 30.3%  | 69.7%  | 0.1%                      | 1998-2004        |
| ESTER2  | 25.1%  | 74.9%  | 29.8%                     | 1999-2008        |
| ETAPE   | 18.5%  | 81.5%  | 35.2%                     | 2003-2004        |
| EPAC    | 18.21% | 81.8%  | 1.1%                      | 2010-2011        |
| REPERE  | 20.0%  | 80.0%  | 0.1%                      | 2011-2013        |

Conclusions

- Corpora are not balanced in gender

Loi n° 2014-873 du 4 août 2014 pour l'égalité réelle entre les femmes et les hommes

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### Conclusions

- Corpora are not balanced in gender
- There is a need of corpora after 2014 to see the effects of the French gender equality law.

> Loi n° 2014-873 du 4 août 2014 pour l’égalité réelle entre les femmes et les hommes
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INTERACTION AND GENDER

Corpus: Subset of the ALLIES (Larcher 2021) corpus composed of medias

| Show (#)                  | Duration | Overlapped speech | Female/Male Proportion |
|---------------------------|----------|-------------------|------------------------|
| Ça vous regarde (20)      | 15h      | 10.44%            | 16.4% / 81.6%          |
| Entre les lignes (31)     | 16h      | 8.08%             | 7.9% / 91.4%           |
| Pile et face (40)         | 17h      | 10.99%            | 16.7% / 83.2%          |

- Corpora are not balanced in gender either (Male anchor)
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- Corpora are not balanced in gender either (Male anchor)
- Overlap ratio is high => Lively debates
**TYPOLOGY OF INTERACTIONS**

**Interaction**: A speaker speaks after another

- **Overlap** = $O$
- **Speaker Change** = $SC$

**Total number of interactions** = $\Omega$

**Interactions with overlap** = $(O \cap SC^c) \cup (O \cap SC)$

**Interactions with overlap** = $O$

**Interruptions** = $O \cap SC$

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Interaction without overlap ($O^c$)

Interaction with overlap and speaker change ($O \cap SC$)

Interaction with overlap, without speaker change ($O \cap SC^c$)
### Results and Analysis

Overlap set: $O$, Speaker change set: $SC$

| Gender interaction | Interactions number | $|O\cap SC|$ |
|--------------------|---------------------|------------|
| $S_1 - S_2$        | $\Omega$            | $O$        | $O \cap SC$ |
| M-M                | 12008               | 4420 (36.81%) | 2208 (49.95%) |
| M-F                | 1359                | 640 (47.09%)  | 371 (57.97%)  |
| F-M                | 1357                | 716 (52.76%)  | 311 (43.44%)  |
| F-F                | 467                 | 78 (16.70%)   | 31 (39.74%)   |

**Conclusions**

- Mixed gender interactions have more overlaps
RESULTS AND ANALYSIS

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|--------------------|---------------------|-------------|---------|----------------|
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Conclusions

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- Women interrupt and overlap each other less than men
RESULTS AND ANALYSIS

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### RESULTS AND ANALYSIS

Overlap set: \( O \), Speaker change set: \( SC \)

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### Conclusions

- Mixed gender interactions have more overlaps
- Women interrupt and overlap each other less than men
- Surprisingly, Women interrupt more men than men interrupt women
- The role probably has a huge impact and is currently investigated
TAKEWAY

- Type of show affects the distribution of overlap segments duration
- Corpora are unbalanced on gender
- Annotations in overlap and gender are not homogeneous.
  - There is a need to reharmonise existing corpora
  - One of the objectives of the ALLIES corpus
- Mixed gender interactions have more overlaps than single-gender interactions, in equal proportion between men and women
  - Further studies must be done taking into account the roles and on a larger collection of data to confirm these observations.
OPENING

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