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Overlaps and Gender Analysis in the Context of Broadcast Media



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ANR GEM : GENDER EQUALITY MONITORING

- 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 man interrupting



Definitions

Maninterrupting : 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

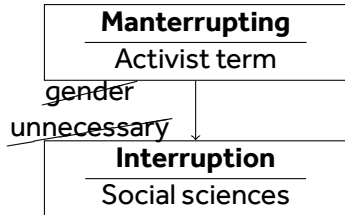
- Zimmerman, D., West, C., (1975) "Sex roles, interruptions and silences in conversations", in Language and Sex : Difference and Dominance
- Adda-Decker et al. (2008) "Annotation and analysis of overlapping



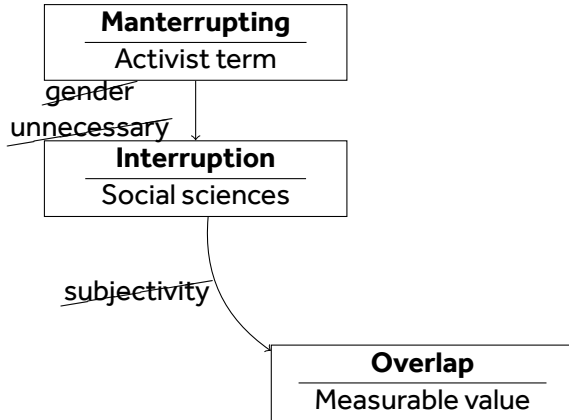
Manterrupting
Activist term



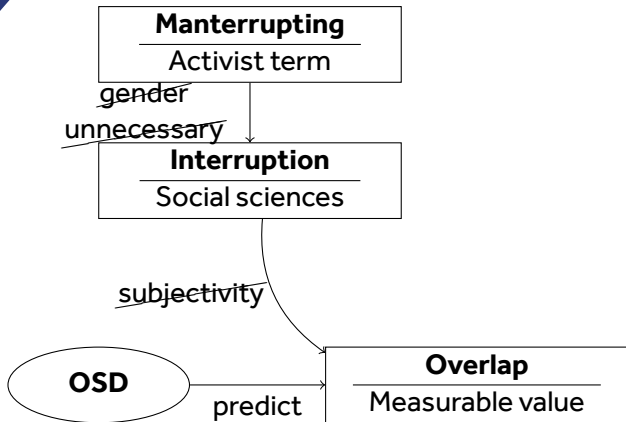
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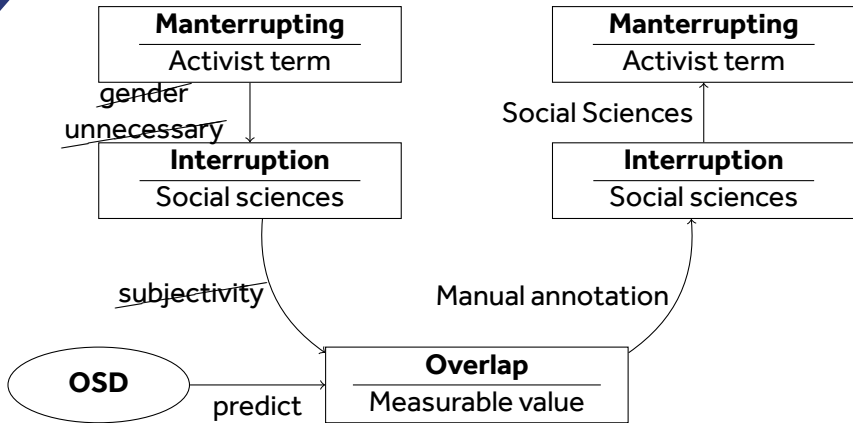
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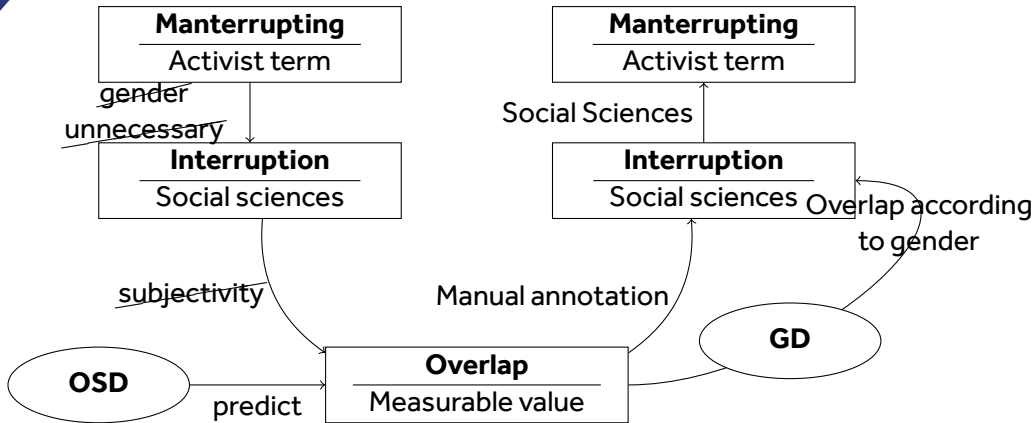
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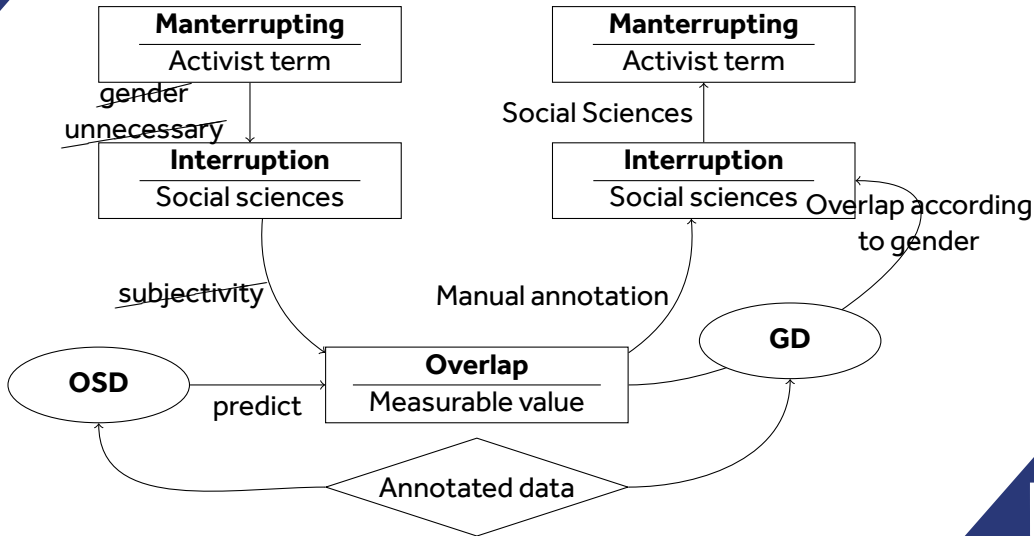
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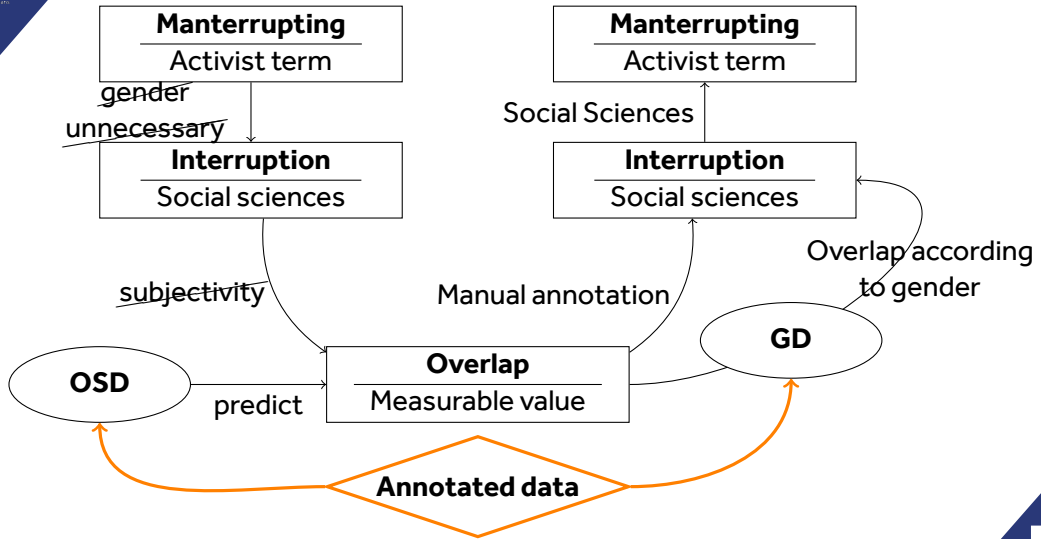


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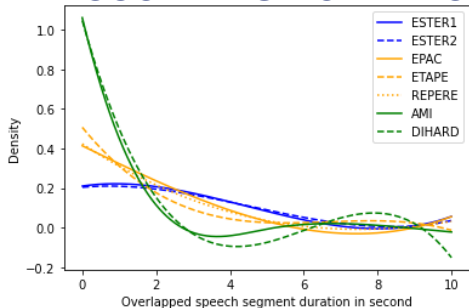




Corpus	Overlap timestamps	Overlap transcription	Gender
Ester1(Galliano 2004)	✓	✓	✓
Ester2(Galliano 2009)	✓	✓	Mostly
Epac(Galliano 2006)	✓	✓	✓
Etape(Gravier 2012)	Not always	✓ + Overlap types	Mostly
Repere(Giraudel 2012)	✓	Not always	✓
<i>AMI(Mccowan 2005)</i>	✓	×	×
<i>Dihard(Ryant 2021)</i>	✓	×	×

+ ALLIES : Metacorpus {Ester1,Ester2,Epac,Etape,Repere}

DISTRIBUTION OF OVERLAP DURATION ACCORDING TO THE CONTENT



- Broadcast news : Ester1 and 2
- Debates : Etape - Epac - Repere
- Spontaneous speech : AMI - DIHARD

Conclusions

- 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 won't be adequate to use it on broadcast news.

STATISTICAL STUDY - OVERLAP

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**



	Annotated Proportion			
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

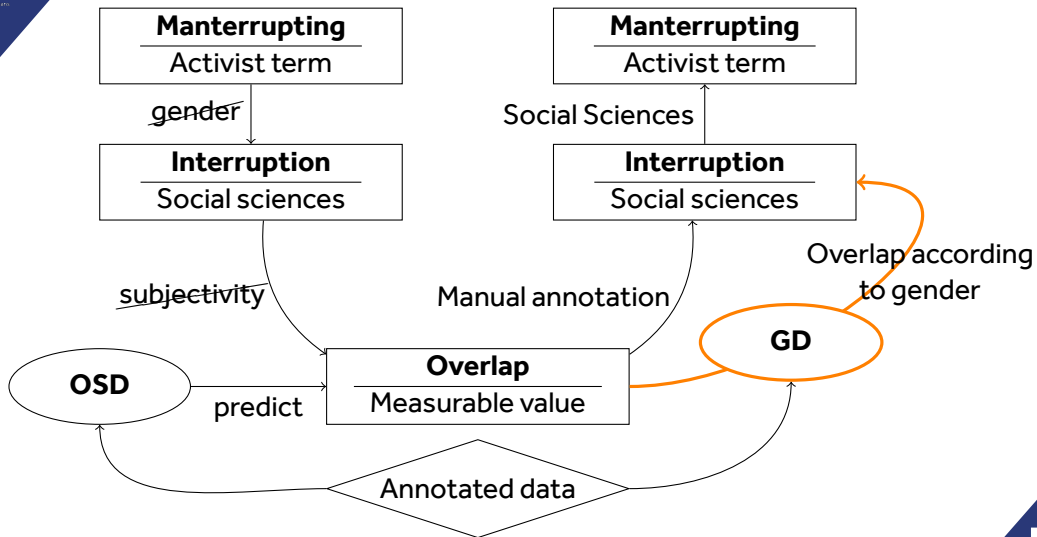


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Conclusions

- 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





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 without overlap (O^c)



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



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

Interaction : A speaker speaks after
another

Overlap = O

Speaker Change = SC

Total number of interactions = Ω

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

Interactions with overlap = O

Interruptions = $O \cap SC$

RESULTS AND ANALYSIS

Overlap set : O , Speaker change set : SC

Gender interaction	Interactions number		
	Ω	O	$O \cap SC$
$S_1 - S_2$			
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

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- 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

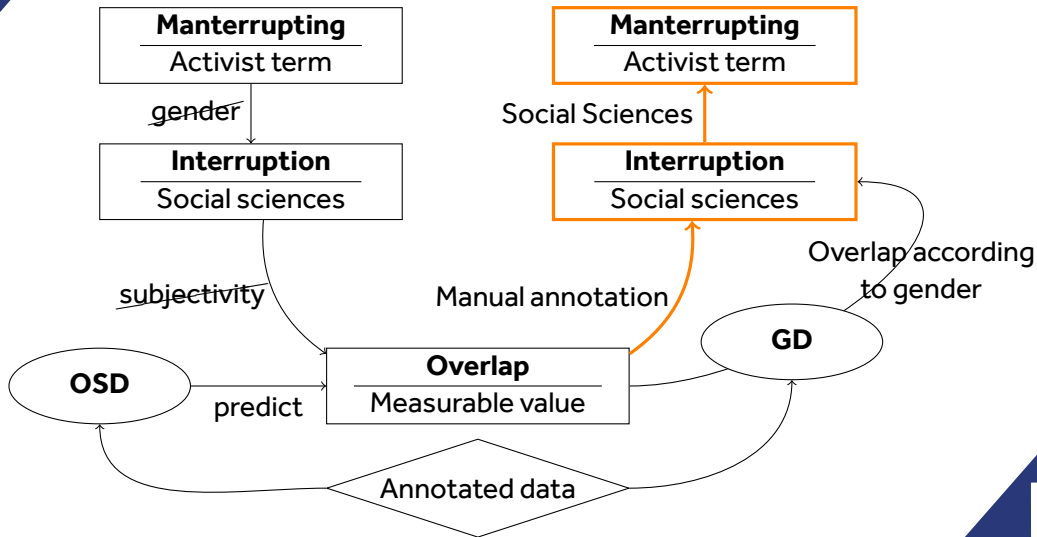


TAKAWAY








- 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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