ANNOTATION AND ANALYSIS OF OVERLAPPING SPEECH IN POLITICAL INTERVIEWS

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TALK OUTLINE

- Framework
- Corpus
- Overlap segmentation
- Overlap tagset and annotation
- Analysis of overlapping speech
- Overlapping speech and disfluencies
- Conclusion and discussion

FRAMEWORK

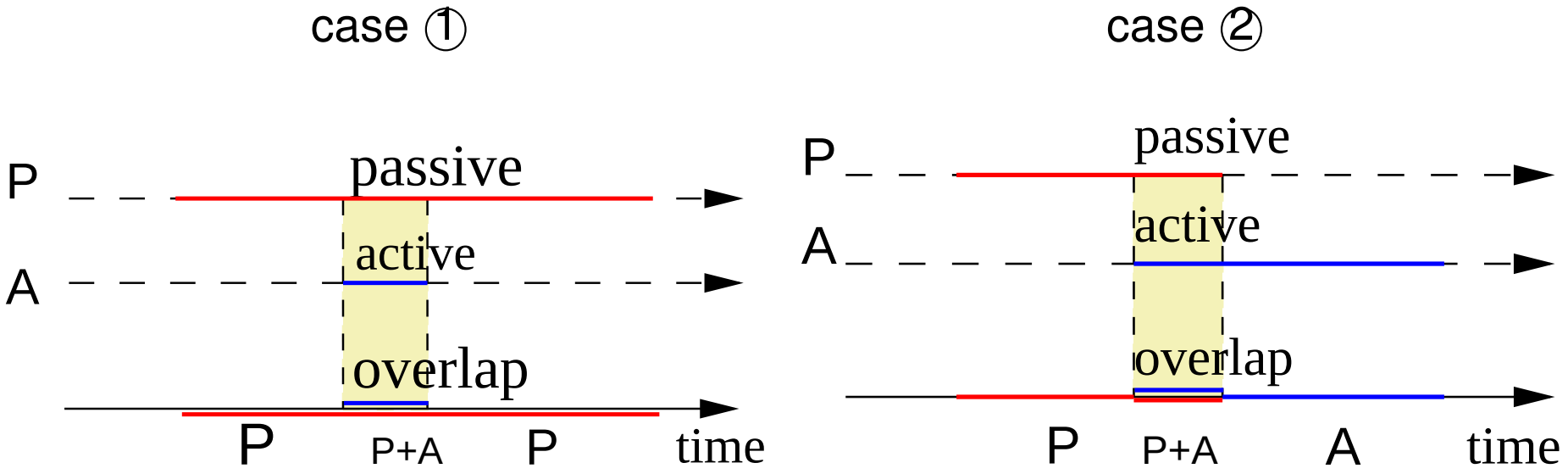
- Overlapping speech in TV political interviews
- Questions addressed:
  - How to segment and annotate overlapping speech?
  - Typology of overlapping speech in relation with its intrusive nature
  - Speaker roles in different overlap types
  - Link with disfluencies

CORPUS

- 8 one-hour French TV shows
- 1 major figure (either politician or from civil society) interviewed by 3 journalists and 1 chairman
- Fine-grained transcriptions including discourse markers and disfluencies (filled pauses, repetitions, revisions)
- Overlaps transcribed using a customised version of TRANSCRIBER `http://trans.sourceforge.net/`

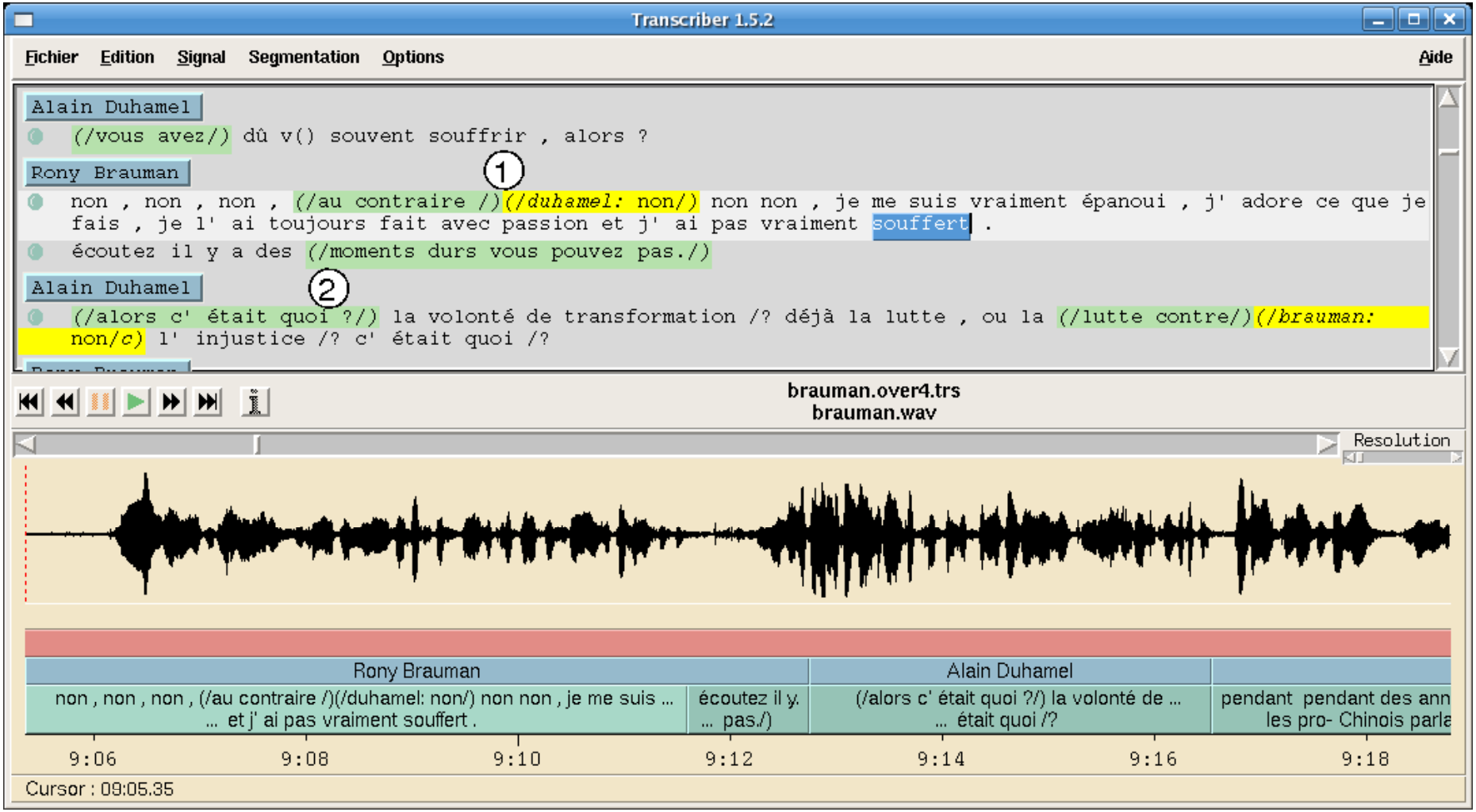
OVERLAP SEGMENTATION

Two overlapping cases:
case ①: no speaker change; case ②: speaker change.



OVERLAP SEGMENTATION

Overlap segmentation examples (cases ① and ②) in the customised Transcriber annotation editor



OVERLAP TAGSET AND ANNOTATION

Overlap tagset defined after an interative process:

- good inter-annotator agreement
- mutually exclusive categories

4 overlap tags:

bck *backchannel*: “hmm”, the listener follows the speaker;

cmp *complementary*: the incoming speaker overlaps the main speaker but does not take the floor.

tst *turn stealing*: the incoming speaker clearly interrupts the main speaker;

att *anticipated turn taking*: the incoming speaker anticipates the end of the main speaker’s turn;

OVERLAP TAGSET AND ANNOTATION

Examples of the different overlap types, producing case ① (**bck**, **cmp**) and case ② (**tst**, **att**) overlaps.

bck: *backchannel*

A: it is simply /the fact/ /B: hmm/ that...

cmp: *complementary*

A: I have a last question /about/ /B: very short/ about your...

tst: *turn stealing*

A: and in /this case.../

B: /I want to/ come back...

att: *anticipated turn taking*

A: and this leads to humanitarian /action?/

B: /well I/ think

DISTRIBUTION OF SPEECH OVERLAPS PER TAG PASSIVE/ACTIVE ROLES

3-4 overlaps per minute including less than 5% of the words of the corpus

Overlap frequency (# segments per minute), word rate and mean length for passive (P) and active (A) roles, for **bck**, **cmp**, **tst** and **att**.

category		over. freq.	words %	mean length
non intrusive overlaps				
bck	P	1.2	0.8	1.6
	A		0.6	1.2
att	P	0.4	0.4	2.1
	A		0.5	2.3
intrusive overlaps				
cmp	P	0.7	1.1	3.4
	A		1.1	3.5
tst	P	1.1	1.7	3.3
	A		1.9	3.8

ANALYSIS OF OVERLAPPING SPEECH
ATTACK/RESIST RATIO

Attack/resist ratio R attack density D

$$R = \frac{A - P}{A + P} \qquad D = (\frac{100 \times A}{M + P + A})$$

A = active zone of the speaker; P = passive; M = mono-speaker (in words)

set	R	D
all	**0.0**	**4.0**
journalists	**0.3**	**8.0**
interviewees	**-0.3**	**2.2**
Chairman	**0.2**	**6.6**

journalists	R	D
Journ1	0.3	10.8
Journ2	0.5	6.7
Journ3	0.1	4.3

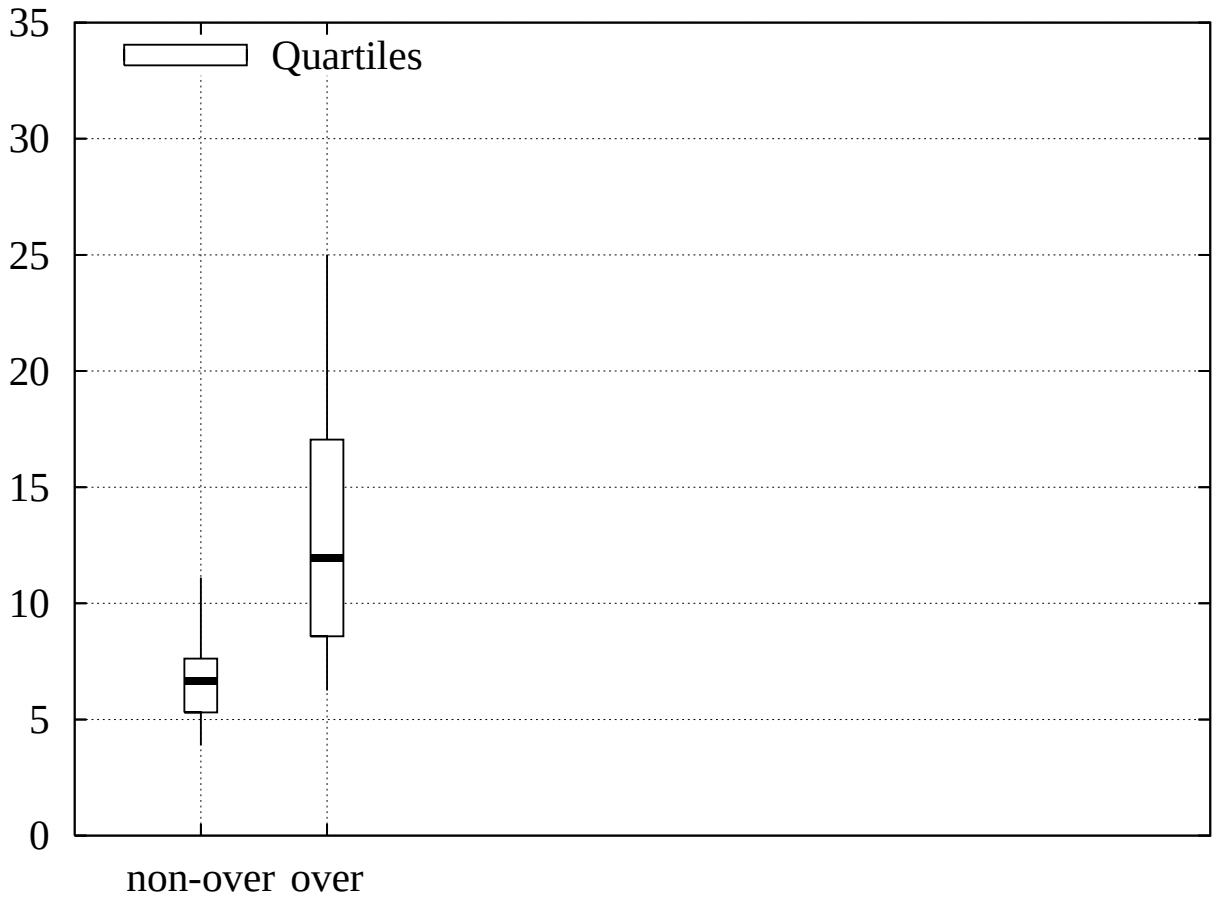
interviewees	R	D
IntPF0	-0.1	2.4
IntPF1	0.0	3.6
IntPF2	-0.2	3.4
IntPF3	-0.6	1.0
IntCF1	-0.4	2.9
IntCF2	-0.7	1.2
IntPI1	-0.4	0.7
IntPI2	-0.1	2.3

OVERLAPPING SPEECH AND DISFLUENCIES

Disfluency rates for the different segment types

non-ov: non overlapping speech
over: overlapping speech

non-intr: non-intrusive overlaps (**bck**, **att**)
intr: intrusive overlaps (**cmp**, **tst**)



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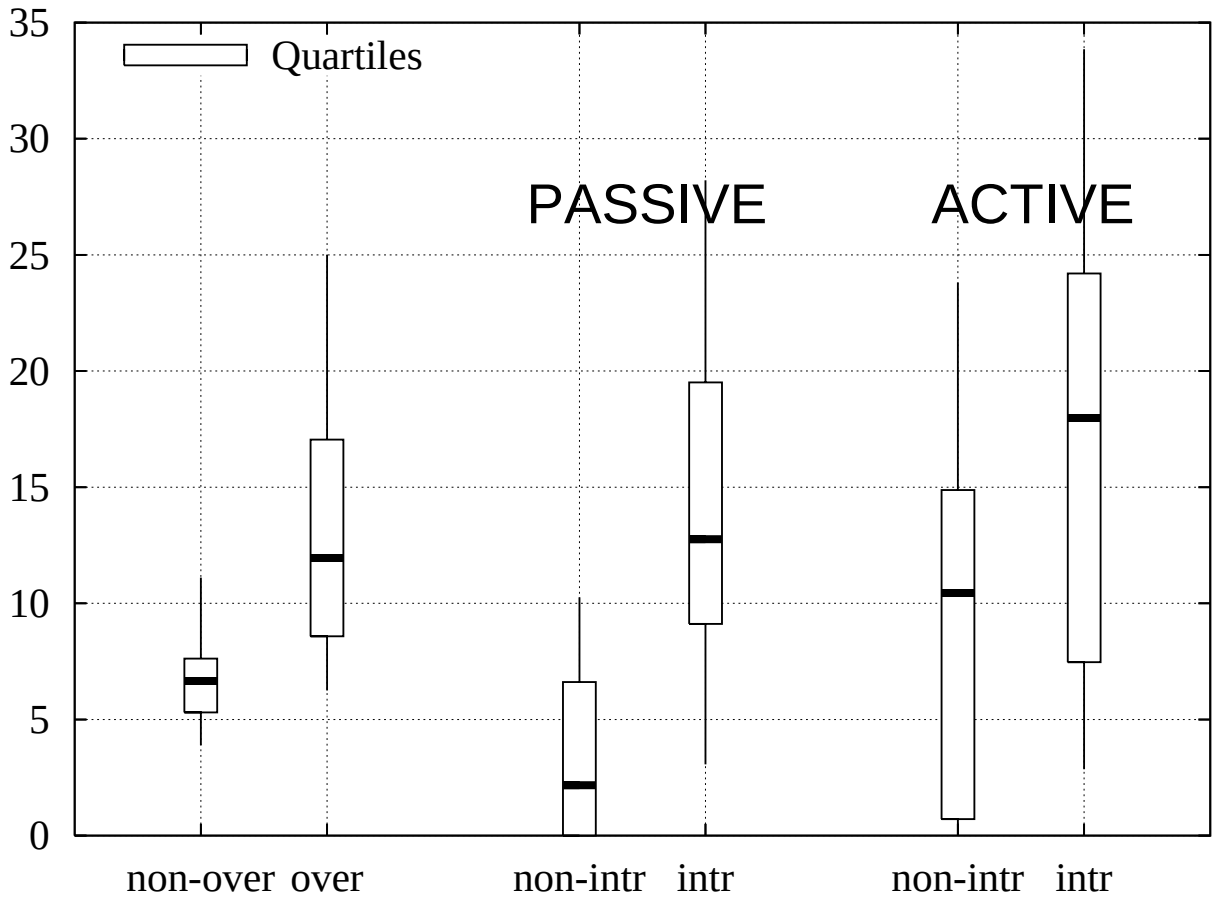

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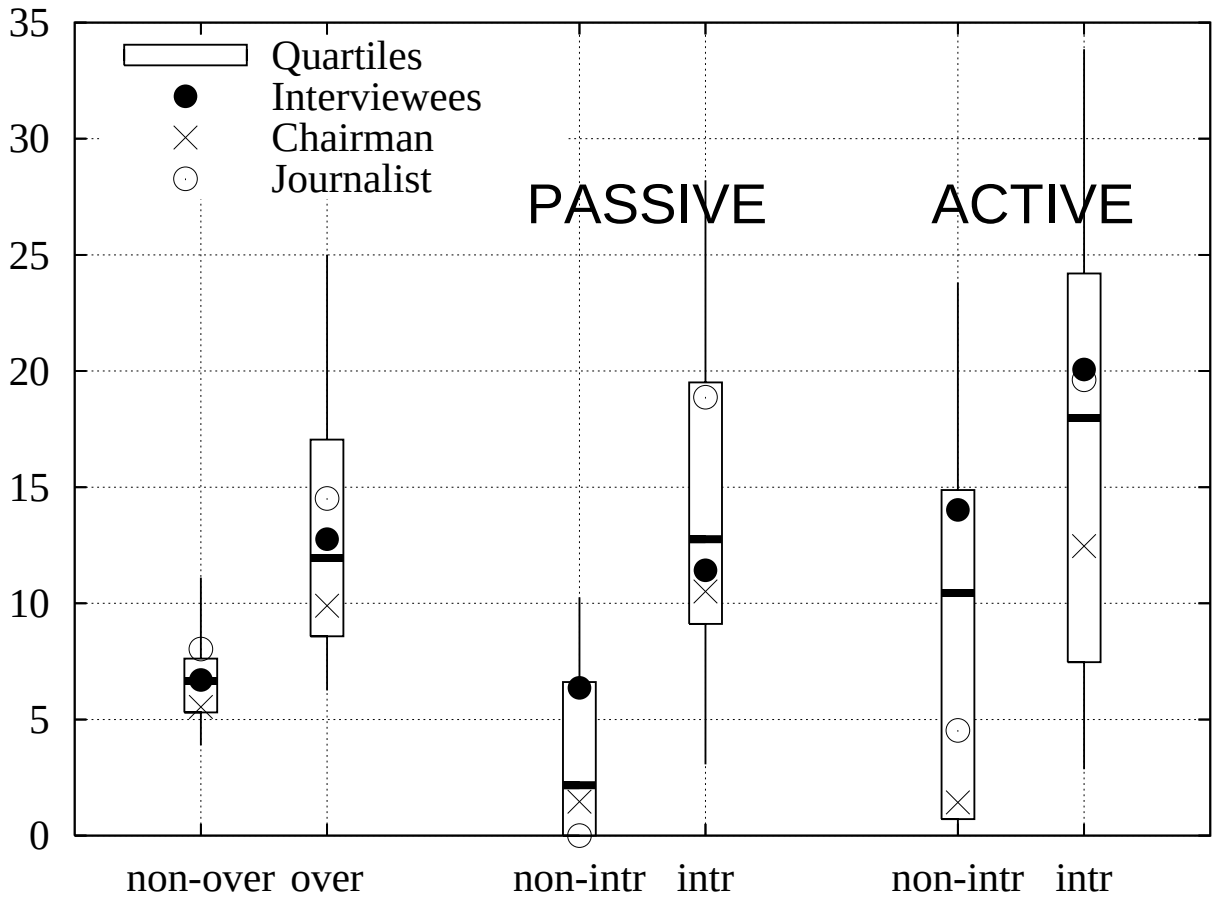


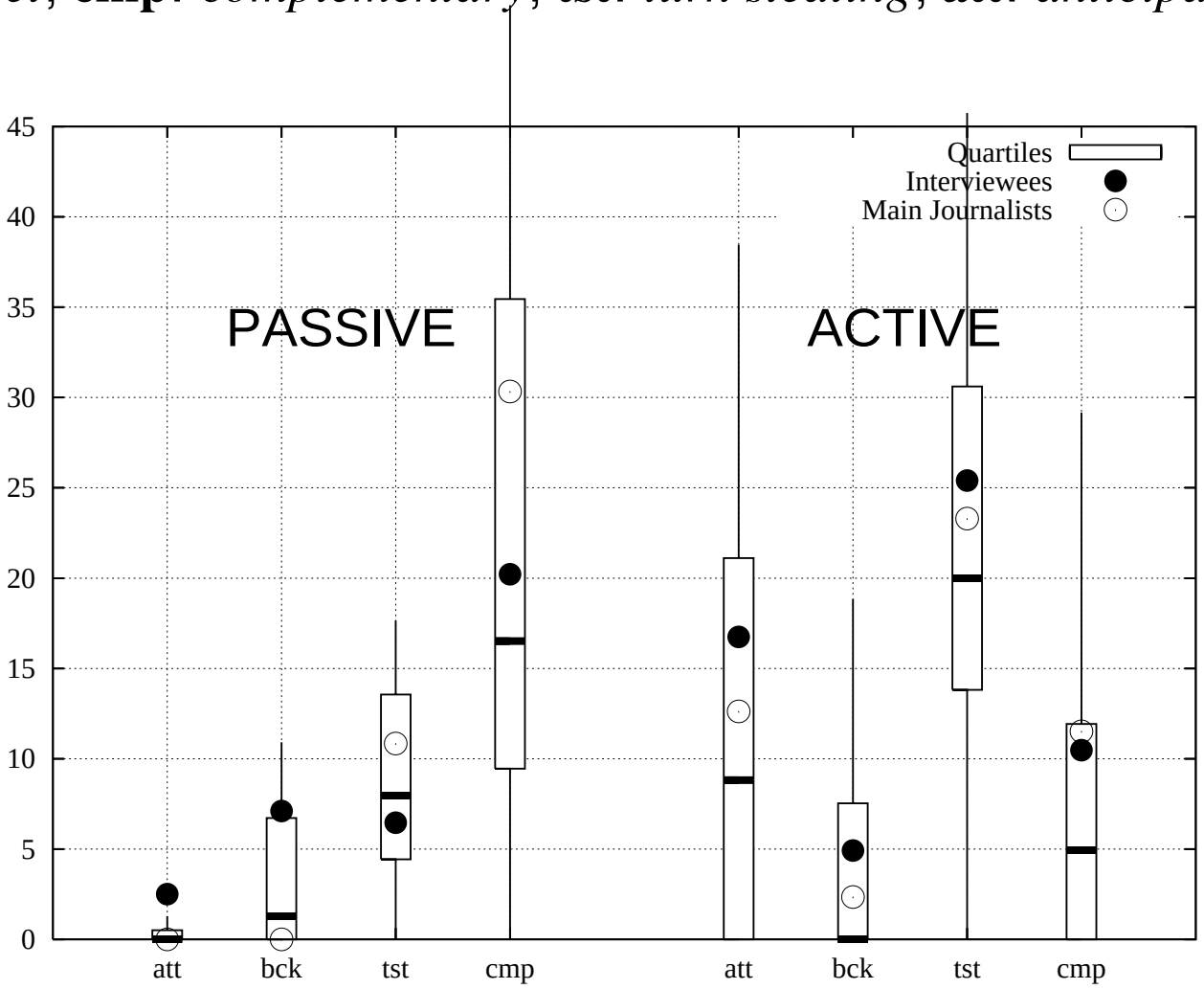
CONCLUSION AND DISCUSSION

- Annotation of overlapping speech
  - annotation process which preserve the interaction structure
  - reduced tagset to simplify the annotation
  - enables the study of overlap/disfluencies/speaker role
- Overlapping speech and disfluencies
  - twice more disfluencies on overlaps
  - very high %disfluencies for passive speakers in *complementary* overlaps
  - lower %disfluencies on *backchannel* than on non-overlapping speech
- Speaker role and disfluencies
  - high %disfluencies for journalists in passive/intrusive situation

OVERLAPPING SPEECH AND DISFLUENCIES

Disfluency rates for the different segment types

bck: *backchannel*; **cmp**: *complementary*; **tst**: *turn stealing*; **att**: *anticipated turn taking*



ANNOTATORS' AGREEMENT

Overlap label distribution from 5 annotators (one show)

		annotator labels (%)			
label	count	**bck**	**cmp**	**tst**	**att**
bck	63	91.1	8.0	1.0	0.0
cmp	50	9.2	75.8	15.0	0.0
tst	107	0.4	3.6	89.2	6.8
att	26	0.0	0.0	**24.0**	76.0

Kappa inter-annotation agreement 0.7 - 0.8

HOMOGENEOUS SPEECH REGIONS

H-Region:
maximum length segment keeping homogeneous speaker characteristics

set	#H-regions	(%H-regions)	#words	(%words)	average length
all	4,000	(100)	83,000	(100)	20.7
mono-speaker	2,600	(65)	79,300	(95)	30.0
overlap	1,400	(35)	3,700	(5)	2.7

OVERLAPPING SPEECH
DISCOURSE MARKERS AND DISFLUENCIES

DM: discourse markers; **FP**: filled pauses; **RV**: revisions; **RP**: repetitions

category		% DM	% disfluencies FP	RV	RP	All
mono-speaker		2.4	2.0	2.5	2.5	6.9
overlaps	P	2.1	1.6	2.3	7.2	11.1
	A	5.9	0.5	3.0	11.0	14.5
non-intrusive	P	2.4	1.6	2.0	1.3	4.9
	A	7.2	0.6	0.9	5.2	6.7
intrusive	P	2.0	1.6	2.5	9.5	13.6
	A	5.4	0.4	3.8	13.0	17.2

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journalists	R	D
Duhamel	0.3	10.8
du Roy	0.5	6.7
Colombani	0.1	4.3

interviewees	R	D
Pinay	-0.1	2.4
Delors	0.0	3.6
Pasqua	-0.2	3.4
De Robien	-0.6	1.0
Voynet	-0.4	2.9
Brauman	-0.7	1.2
Diouf	-0.4	0.7
Brittan	-0.1	2.3