

# Perception of Movement Expressivity in Emotional TV Interviews

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# Research context

- Movement expressivity / Perception of emotion
  - Boone & Cunningham, 1998
  - DeMeijer, 1989
  - Newlove, 1993
  - Wallbott, 1998
- These studies use videos of acted emotions
- Few studies use spontaneous data
  - Douglas-Cowie et al., 2003
  - Abrilian et al., 2005
- Multimodal nature of emotional phenomena

# Research goals

- Modeling of « real-life » multimodal emotional behaviors
  - Understand how people perceive multimodal expressions of emotions in visual channels (gestures, head movements)



Perceptive test on movement expressivity

# Outline

- Goals of the perceptive test
- Experimental protocol
- Results
- Conclusion and Future directions

# Goals of the perceptive test (1)

- Perception of multimodal behaviors in TV interviews
- 6 expressivity parameters (Pelachaud, 2005; Hartmann et al., 2005)
  - Global activation
  - Repetition
  - Spatial extent
  - Speed
  - Strength
  - Fluidity

# Goals of the perceptive test (2)

- Goals
  - Collect global annotations of movements expressivity for whole clips
  - Compare annotations of movements expressivity with
    - Time-based annotations of multimodal behaviors
    - Annotations of emotion and audio clues

# Experimental protocol (1)

- 29 video clips from EmoTV corpus
  - TV interviews
  - 24 clips rich in multimodal emotional behaviors
  - 5 clips containing very few multimodal behaviors
- 20 subjects
  - 11 males, 9 females
  - Age between 19 and 54 (average 32)
  - 8 students in computer science
  - 8 researchers, teachers or engineers
  - 4 working in laboratory administration

# Experimental protocol (2)

- Manually annotate the perception of the expressivity of head, torso, hand movements
  - Marking the level of each parameter on a line



Ext-44

Activation

Repetition

Spatial extent

Speed

Strength

Fluidity

Passive

Only once

Contracted

Slow

Weak

Jerky

Active

Several repetitions

Expanded

Fast

Strong

Fluid

# Results (1)

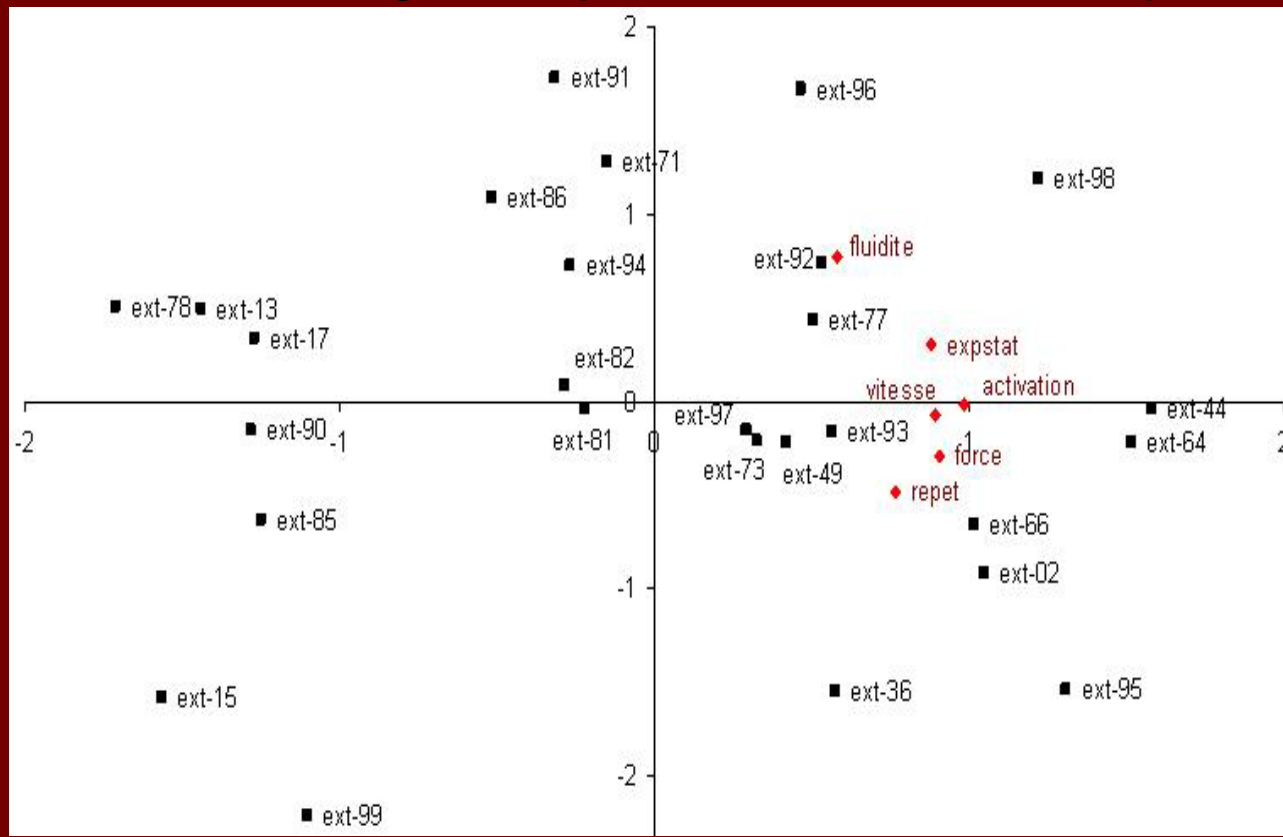
## Correlations between subjects

- $r$  = average when correlating subjects 2 by 2
- Used threshold
  - « Good » correlation when  $0.4 < r < 0.8$
- « Good » correlations
  - Spatial extent :  $r = 0.58$
  - Activation :  $r = 0.55$
  - Repetition :  $r = 0.45$
  - Strength :  $r = 0.44$
- « Low » or no correlations
  - Speed :  $r = 0.35$
  - Fluidity :  $r = 0.13$

# Results (2)

## Principal Component Analysis (PCA)

- Position clips and parameters in a unique cloud of points
- 88.4% of variability is explained (model acceptable at 70%)



# Results (3)

## Principal Component Analysis (PCA)

- The 6 parameters are all positioned in the right part
- Clips placed near the parameters have high scores in these parameters
- Clips placed in the left part have low scores in these parameters
- Interpretation of horizontal axe
  - Opposes clips that obtained high scores and clips that obtained low scores in average of the 6 parameters
- Interpretation of vertical axe
  - Opposes fluidity and repetition

# Results (4)

## Average values of expressivity parameters

- Computed from the annotations of the 20 subjects

	Clip	Activ.	Repet.	Spat.	Speed	Stren.	Fluid.
	13	20%	22%	18%	24%	30%	45%
3 min values	64	73%	73%	60%	76%	65%	56%
	78	18%	21%	12%	28%	14%	43%
	92	54%	45%	78%	46%	53%	51%
	95	75%	83%	52%	60%	76%	45%
3 max values	98	73%	64%	61%	63%	50%	67%
	99	29%	50%	9%	46%	32%	23%

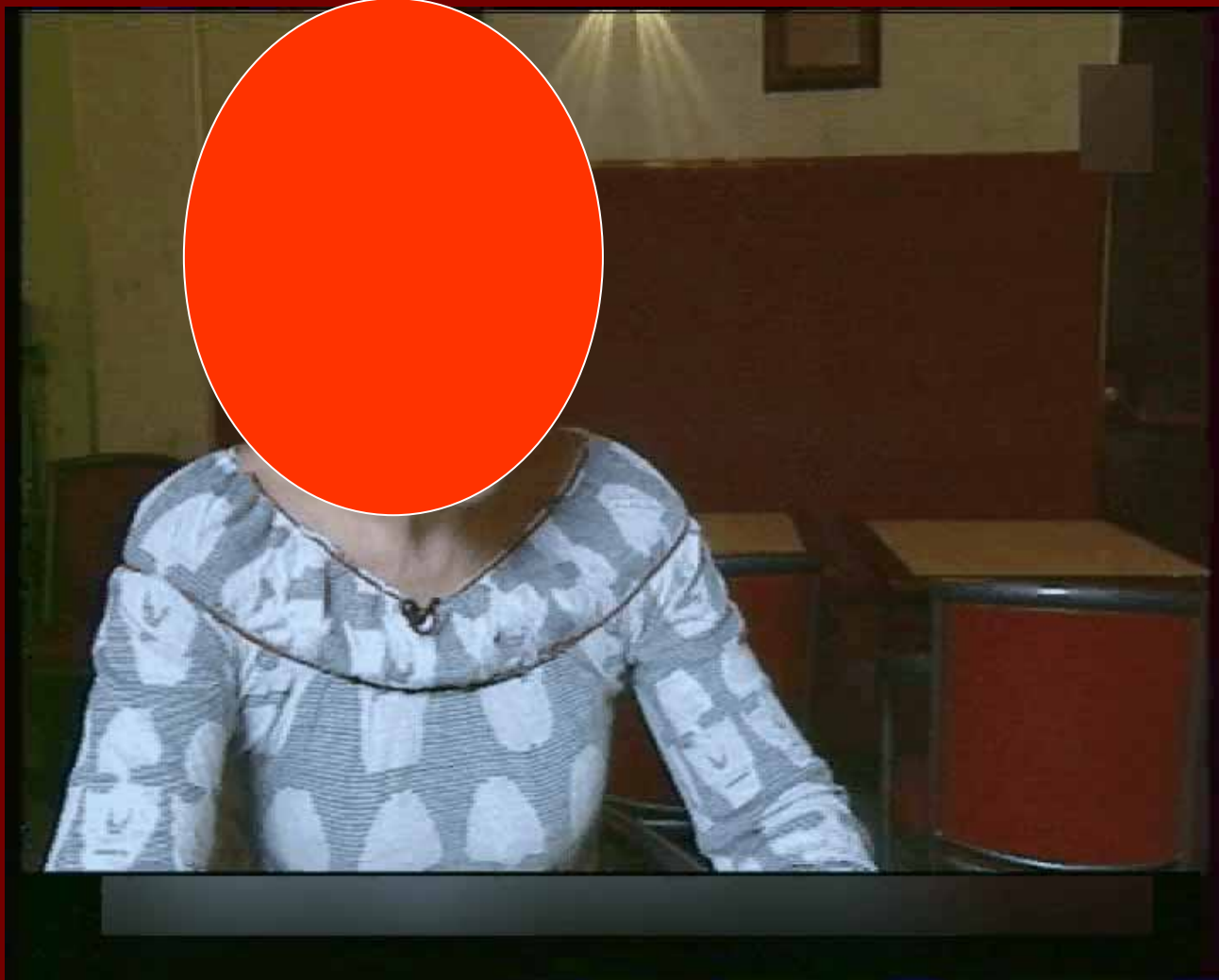
# Results (5)

Clip 78 : lowest activity, repetition, strength



# Results (6)

Clip 95 : highest activity, repetition, strength



# Conclusion

- Study of perception of movement expressivity in TV interviews
- 4 expressivity parameters correlated
  - Spatial extent
  - Global activation
  - Repetition
  - Strength

# Future directions

- Eysenck Personality Questionnaire (EPQ)
- Perception differences with regards to gender, age, and activity
- Comparison with previous annotations of
  - Multimodal behaviors
  - Emotions



Study the relations between perception of emotions and movement expressivity