

Interférences, transferts, apprentissage de la prosodie affective dans le contexte multimodal

Marine Guerry† Takaaki Shochi‡ Jean-Luc Rouas‡‡ Albert Rilliard‡‡‡

† CLLE-ERSSaB, UMR5263 CNRS, Bordeaux, France

‡ CLLE-ERSSaB, UMR5263 CNRS, Bordeaux, France

‡‡ LABRI, UMR 5800 CNRS, Bordeaux, France

‡‡‡ LIMSI, CNRS Orsay, France

E-mail: shochi38@gmail.com,



Affective speech

- Emotions : innate reactions, supposed to be universal, effects to external stimuli (Ekman, 1972; Damasio, 1994)
- **Attitudes or social affects**: intended reactions produced by speaker for communicative purpose (Aubergé, 2002)
 - Semantic control of speech
 - Take account of communicative partner (Callamand, 1987)
 - Conventional encoding in a language/culture (Rilliard et al., 2009)
 - Acquisition early in the childhood

Attitudes & cross cultural communication

Existence of certain culturally « specific » social affects (Shochi, 2008)

However, cross cultural communication using Foreign languagee learner's competence about affective AV prosody allow us to:

- convey appropriate intention
- recognize better the « real » intention of speaker which can be opposed to the lexical contents

Research about the relationship between affective prosody & foreign language competence implicates:

- To investigate the perception of attitudes in foreign language with non native subjects (Pavlenko, 2005).
- To inject models of attitudinal prosody for Foreign language method (Delattre, 1966; 1967)

Purpose of experiments

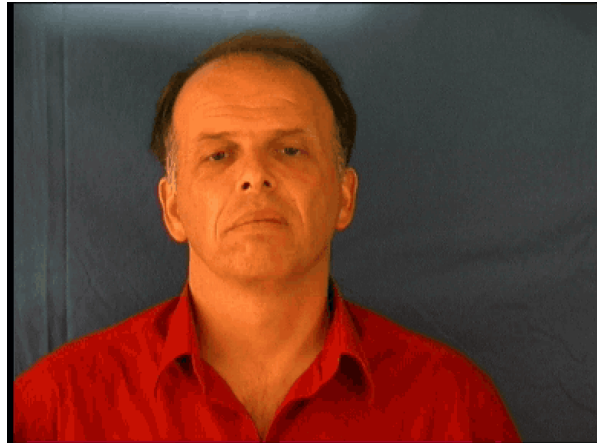
Test the training effect about attitudinal prosody referred to the French teaching method (F.L.E.)

- Comparing the strategies of the way to recognize the French attitudes
- For the following subjects:
 - French (Rilliard et al., 2008)
 - Japanese without any knowledge about French language (Shochi et al., 2008)
 - Japanese learners of French followed the specific training about French attitudinal prosody

Declaration (DC)



Obviousness (OB)



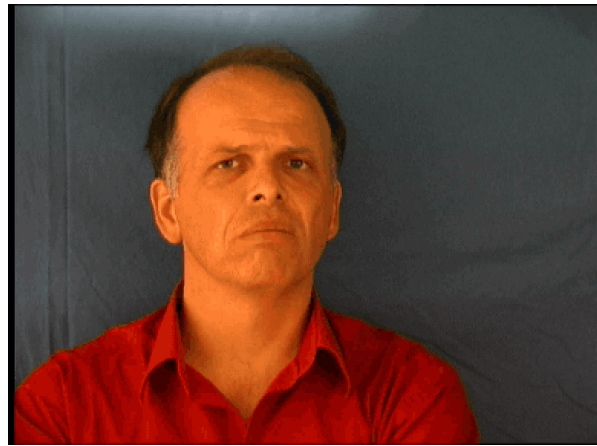
Suspicious Irony (SC)



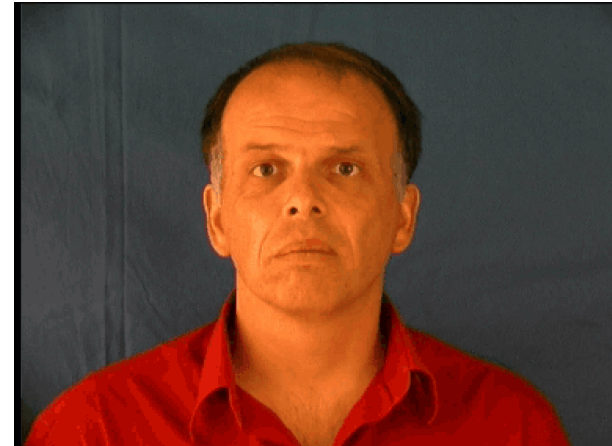
Interrogation (IN)



Doubt-incredulity (DO)



Surprise (SU)



Methodology

– Stimuli:

- 1 same utterance repeated by the same speaker with 6 selected attitudes
- Each utterance are ripped on audio (A), video (V) et audio-video (AV)
→ Total $6 \times 3 = 18$ stimuli

– Procedure :

- Dispositif individuel avec écran et casque
- 2 different presentation orders of stimuli: (A)/(V)/(AV) or (V)/(A)/(AV)
- Listen each stimulus only one time
- Forced Choice amongst 6 attitudes
- Evaluation of expresiveness' intensity for perceivedf attitude

« hardly perceived »

« strong »



– Subjects:

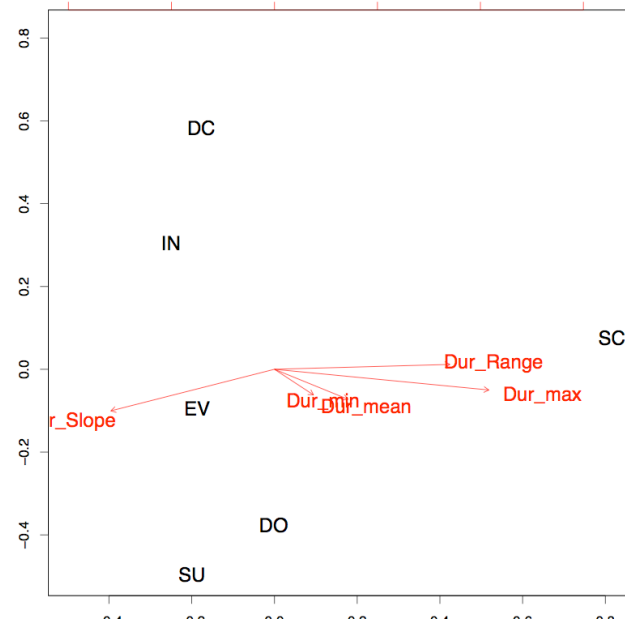
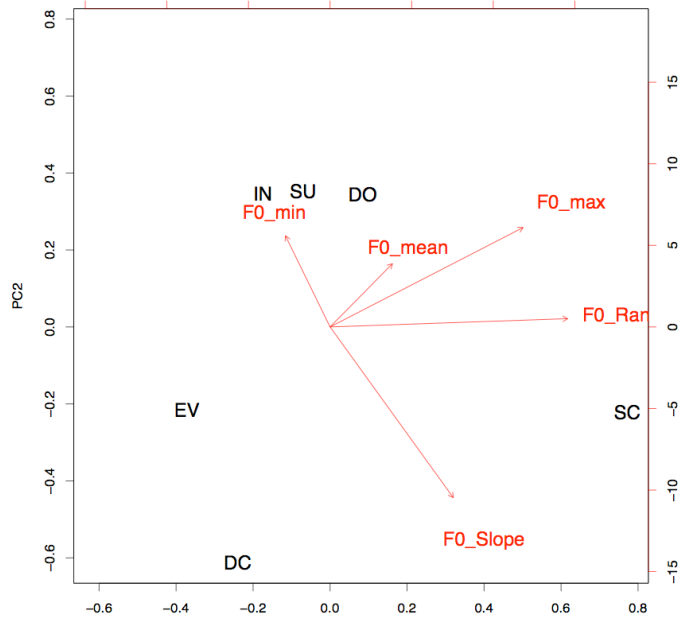
- 32 native French (FR)
- 50 Japanese without any knowledge (JP0)
- 32 Japanese learners of French language (JP1),
(mean age= 18; 25 females; 7 males),
followed specific training about French attitudinal
prosody during 8 classes x 10 min.

Training

1 session of introduction about affective expression
+
6 sessions of teaching / learning process
+
1 session of reminding

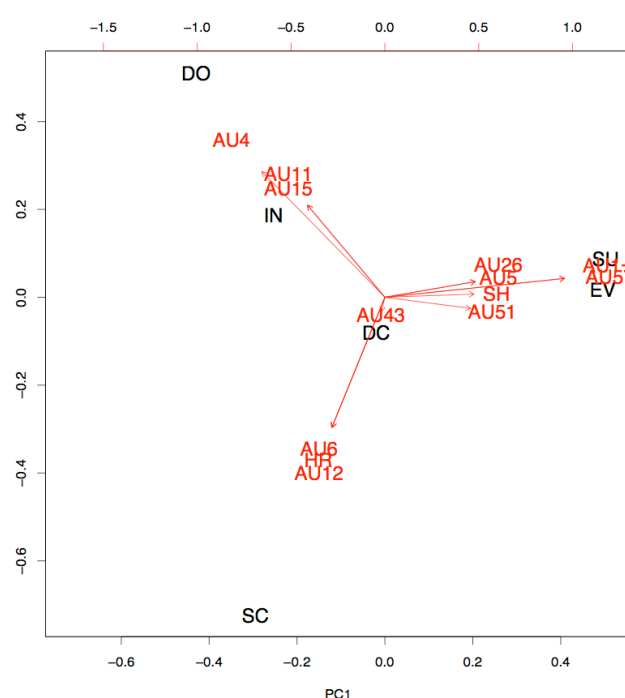
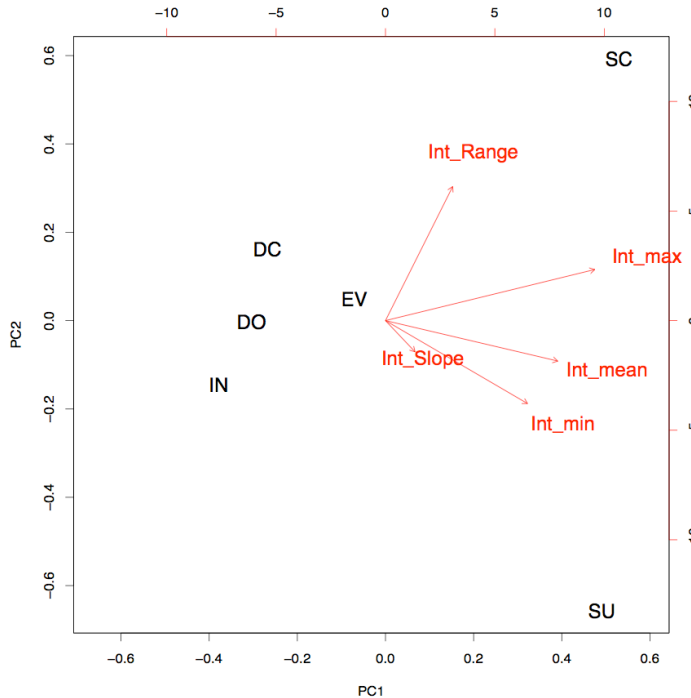
- Enrolement of training:
 1. **Explanation** of both acoustic and gestual characteristics of each affective expression
 2. Exercice of perceptual **discrimination**
 3. **Production** of affective expression combining both audio and gestual characteristics

Acoustic & Facial characteristics by Principal Component Analysis (PCA)



Acoust. Parameters:

- F0 min.
- F0 max.
- F0 range
- F0 mean
- F0 slope
- Dur. min.
- Dur. max.
- Dur. range
- Dur. mean
- Dur. slope
- Int. min.
- Int. max.
- Int. range
- Int. mean
- Int. slope



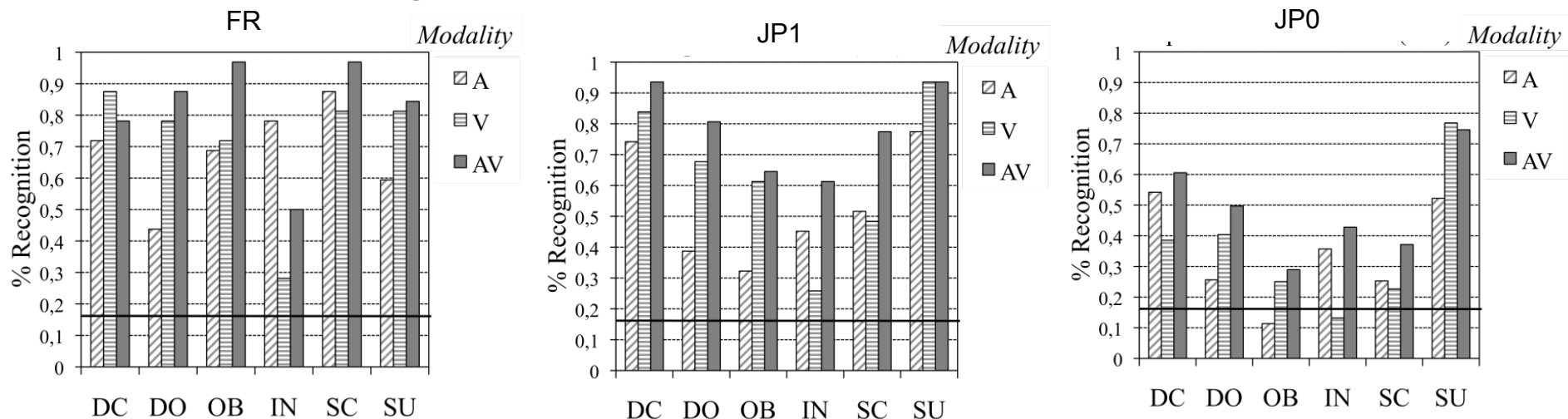
FACS Parameters:

- AU1+2 (Inner&Outer Brow Raiser)
- AU4 (Brow Lowerer)
- AU5 (Upper Lid Raiser)
- AU6 (Cheek Raiser)
- AU11 (Nasolabial Deepener)
- AU12 (Lip Corner Puller)
- AU15 (Lip Corner Depressor)
- AU26 (Jaw Drop)
- AU51 (Head turn left)
- AU57 (Head forward)
- SH (Shoulders up)
- HR (Head Raiser)

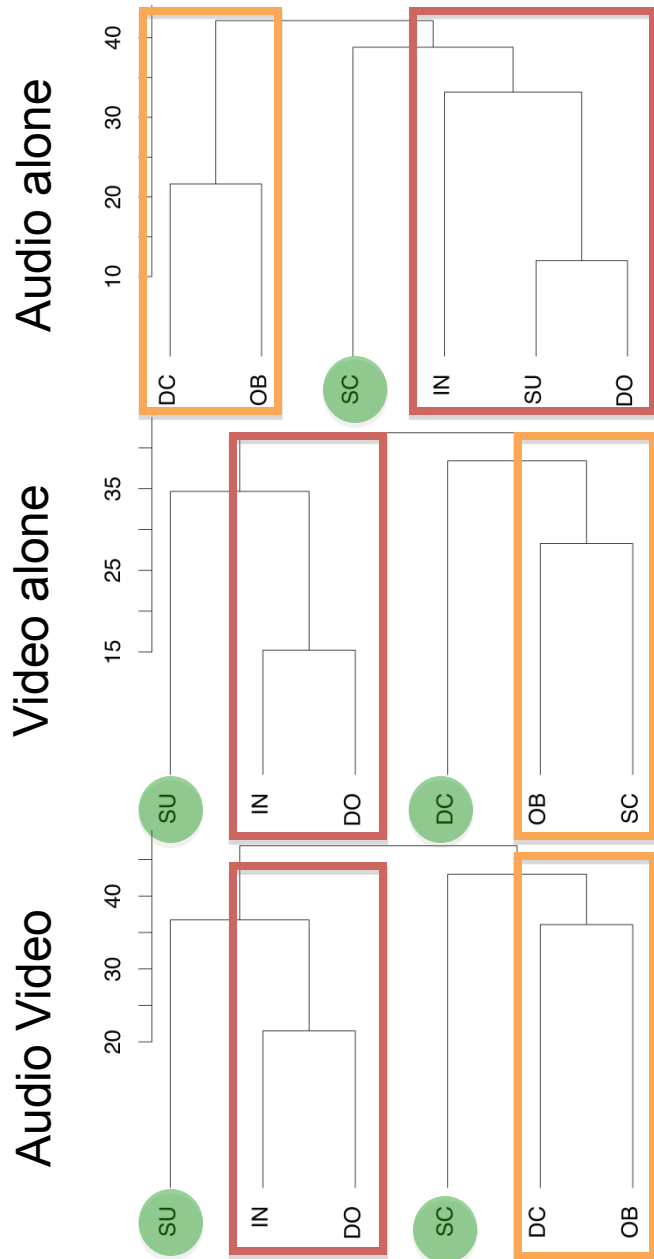
Results (ANOVA)

- Absence of significant influence of presentation order of modalities
- Significant influence of **language level**: FR recognize better all 6 attitudes rather than JP1, who themselves recognize better than JP0 group
- Significant influence of **type of modalities**: AV shows the best scores for all attitudes and for all participants
- Significant influence of **presented attitude**: all 3 groups of subjects show different perceptual reaction especially for OB and SC

Recognition rate for each attitude in 3 different modalities



Perceptual Categorization of FR



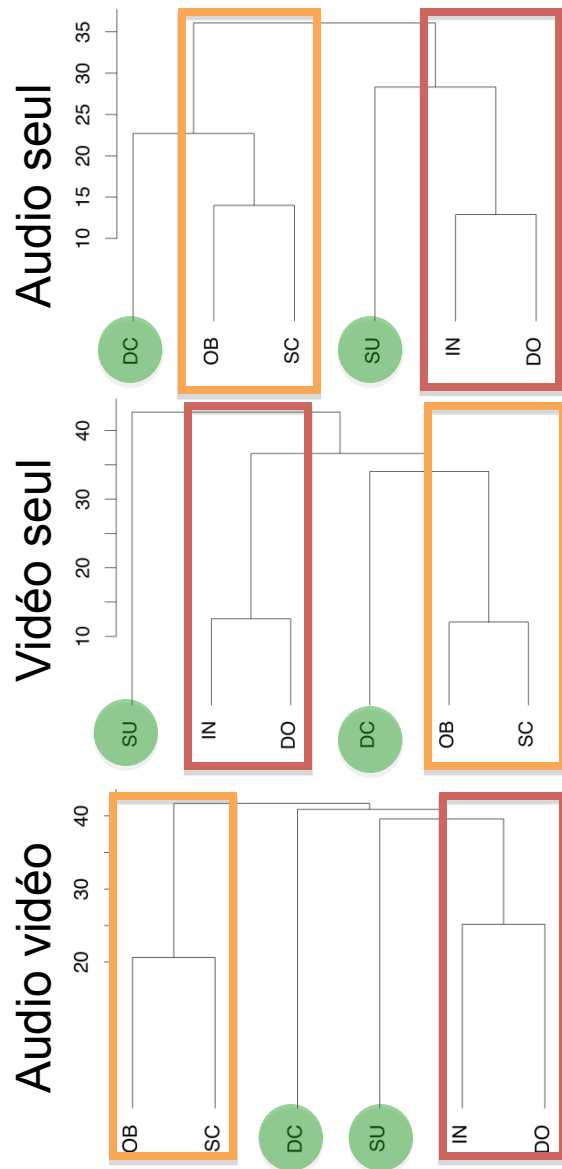
3 perceptual categories on audio alone:

- “Dubitative” expressions (IN, SU, DO)
- “Assertive” expressions (DC, OB)
- + Suspicious Irony (SC) discriminated

4 perceptual categories on video alone and AV:

- “Dubitative” expressions (IN, DO)
- “Assertive” expressions (DC, OB)
- + Suspicious Irony (SC) discriminated
- + Surprise (SU) also discriminated

Perceptual Categorization of JP1



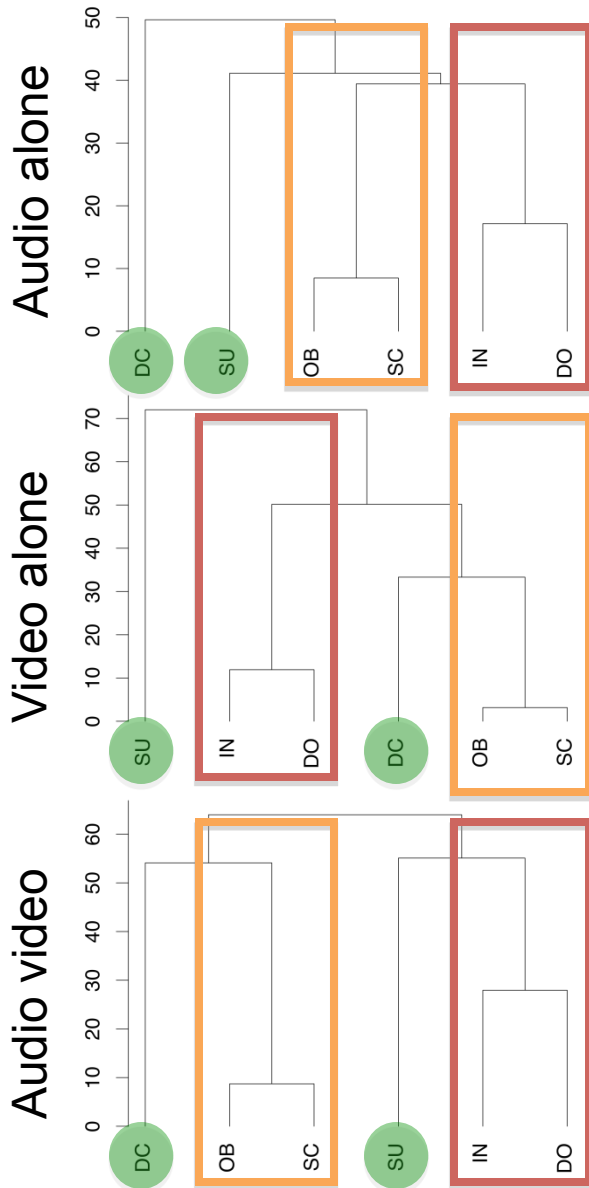
in 3 modalities:
2 perceptual categories :

- “Dubitative” expressions (IN, DO)
- Confusion between SC and OB

+ 2 attitudes discriminated :

- Declaration (DC)
- Surprise (SU)

Catégorisation perceptive des JP0



Opposition dubitative vs. assertive expressions observed only in audio video modality

For 3 modalities:

- Strong confusion between SC and OB (more important degree of confusion than for JP1)

+ 2 attitudes discriminated:

- Declaration (DC)
- Surprise (SU)

Conclusions & perspective

- Japanese subjects understand the meaning of each **attitude**, however the acoustic and gestural realizations **might be hardly recognized**, then it leads a possible **misinterpretation**
- Japanese subjects show **clusters of various attitudes** in French, and it indicates the difficulty to perceive **subtle differences that exists between** these affects
- However, these French attitudes recognition results are encouraging for Japanese F.L.E!

- JP1 have obtained better accuracy than JP0 for all attitudes
- JP1 managed to categorize attitudes more subtly than JP0
- Teaching acoustic parameters and gestures Fo attitudes allowed JP1 a larger choice of perceptual channels

- Apply these acoustic as well as gestural characteristics of affects **to a real didactical material** in order to perform appropriate attitudinal prosody in various communicational environment

ご清聴ありがとうございました m(_ _)m

Merci beaucoup ;-)

Selected attitudes

- 6 French attitudinal expressions (Morlec et al. 01):
 - ***Declaration*** (DC): information énoncée sans point de vue
 - ***Obviousness*** (OB): information énoncée avec certitude
 - ***Suspicious Ironie*** (SC): information énoncée avec sarcasme réprobateur. Le locuteur utilise une intonation contraire à ce qu'il pense
 - ***Interrogation*** (IN): demande d'information sans point de vue ni attente de point de vue
 - ***Doubt-incredulity*** (DO): information énoncée avec suspicion
 - ***Exclamation of surprise*** (SU): information énoncée avec étonnement