Are French speakers… "stress deaf"?

Sensitivity to morphological stress in Spanish

(oral comprehension task): comparison between intermediate and advanced learners.

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Perceiving stress in L2 Spanish : a challenge?

Primary stress in Spanish:

- Lexical or morphological: /'sabana, sa'bana/ (bed sheet, savannah), /'canto, can'to/ (I sing, he sang)

Stress position:

- Spanish: free (can fall on each syllable of the word): oxytone words: cami**ón**, paroxytone words: tra**ge**dia, proparoxitone: (**mú**sica), superproparoxitone (**bé**betelo)
- French: fixed (always falls on the last syllable of the group): un **chat.** Un chat **noir**. Un gros chat **noir**.

Most frequent stress pattern:

- In Spanish: paroxytone
- In French: oxytone

Acoustic Correlates Of Stress:

- Spanish: f0+intensity or f0+ duration
- French: duration

Stress "deafness"?

- In L1, prosodic cues are used to recognize words and the speech processing system is maximally efficient. But when listeners have to recognize words in L2, they use the same processing biases...(Cutler, 2012)
- In the case of French learners, as contrastive stress in Spanish does not exist in French, they show difficulties to perceive the phonological specificities of L2. (Dupoux et al., 1997)

- However, other studies (Mora et al., 1997; Muñoz, 2010; Schwab & Llisterri, 2011…) show that :
- French learners are not so "deaf" and are able to encode lexical stress in their lexical representations
- Stress deafness is not so "persistent"

Lexical stress: retrieved or computed? Stress position assignation.

In fixed-stress languages: all stress pattern are **stored (**Levelt et al., 1999).

In free-stress languages…

-Is stress pattern of all lexical items stored? (Butterworth, 1992; Laganaro, Vacheresse, &Frauenfelder, 2002)

Or

-Are regular stress patterns computed and the irregular ones stored during word encoding? (Colombo, 1992; Roelofs & Meyer, 1998; Levelt et al., 1999)

Or

-Is there a combination of both processes? (retrieval of stored representation+ computation of stress pattern: application of linguistic/statistical rules) (Butterworth, 1992; Laganaro et al., 2002).

Aim of this study

- **Does stress "deafness" equally appear between advanced French learners of Spanish and intermediate learners while detecting incoherencies in an oral comprehension task?**

a) **At a grammatical level with a high probability of top-down processes?**
b) **Compared to segmental vocalic incoherencies (both lexical and morphological)?**

Methods & Materials

PARTICIPANTS:

3 groups matched by gender, age (40.4 [23-53], 21.13 [18-55], 38.8 [20-55]) and education level (tertiary education) :
-20 French advanced late learners of Spanish (C1-C2 of CEFRL) in an immersion environment (Spain > 3 y.: mean=9y.)
-38 French intermediate learners of Spanish (B1-B2 of CEFRL)
-20 matching native Spanish participants

CORPUS (example)

-Yo, cada mañana, desayuno en casa. **La**v**o** la taza, **mi**r**o** la tele, y me voy a trabajar.
→ **coherent**
*[Every morning, I have breakfast at home. **I wash** the cup, **I watch** TV, and I go to work]*
-Yo, cada mañana, desayuno en casa. **La**v**ó** la taza, **mi**r**o** la tele, y me voy a trabajar.
→ incorrect **stress** pattern
*[Every morning, I have breakfast at home. **He washed** the cup, **I watch** TV, and I go to work]*
→ **grammatical incoherence**
-Yo, cada mañana, desayuno en casa. **Le**v**o** la taza, **mi**r**o** la tele, y me voy a trabajar.
→ incorrect **vowel**
*[Every morning, I have breakfast at home. **I break out** [anchor] the cup, **I watch** TV, and I go to work]*
→ **lexical (semantic) incoherence**
-Yo, cada mañana, desayuno en casa. **La**v**e** la taza, **mi**r**o** la tele, y me voy a trabajar.
→ incorrect **vowel**
*[Every morning, I have breakfast at home. **Wash** [imperative] the cup, **I watch** TV, and I go to work]*
→ **grammatical incoherence**

LEVELS OF COMPLEXITY:

-Short oral texts (N=96): Yo, cada mañana, desayuno en casa. **La**v**o** la taza, **mi**r**o** la tele, y me voy a trabajar.
-Simple utterances (N=48): **La**v**o** la taza.
-Isolated words (N=48): **La**v**o**.

ERROR POSITIONS:

In short texts, errors can appear on **first** or **second** verb:

-Yo, cada mañana, desayuno en casa. **La**v**ó** la taza, **mi**r**o** la tele, y me voy a trabajar. *[Every morning, I have breakfast at home. **He washed** the cup, **I watch** TV, and I go to work]*

-Yo, cada mañana, desayuno en casa. **La**v**o** la taza, **mi**r**ó** la tele, y me voy a trabajar. *[Every morning, I have breakfast at home. **I wash** the cup, **I watched** TV, and I go to work]*

MORPHOLOGICAL TARGET VALUES:
1st person (singular) Present / 3rd person (singular) Preterite (concomitant variable: target Stress pattern)

Yo, cada mañana, desayuno en casa. **La**v**o** la taza, **mi**r**o** la tele, y me voy a trabajar.
*[Every morning, , I have breakfast at home. **I wash** the cup, **I watch** TV, and I go to work*
Sara, esa mañana, desayunó en casa. **La**v**ó** la taza, **mi**r**ó** la tele, y se fue a trabajar. *[That morning, Sara had breakfast at home. She washed the cup, watched TV, and went to work]*

TASK:

To assess the linguistic (both grammatical and semantic) acceptability of the listened items:
- intrinsically (short texts)
- in relation with a given (written) context ("Yo, cada día, hago lo mismo…") *[Every morning I do the same…]*

DATA ANALYSIS:

For each comparison, calculation of Signal Detection Theory measures (Stanislaw & Todorov, 1999; Hautus, 1995):

- **Loglinear A' (nonparametric measure of sensitivity)**
- Loglinear B" (nonparametric measure of response bias)

where:
H = (0.5 + Nb of hits) / (1 + Nb of signal trials) and F = (0.5 + Nb of noise trials)

$$A' = .5 + \left[\operatorname{sign}(H-F)\frac{(H-F)^2 + |H-F|}{4\max(H,F) - 4HF}\right]$$

STATISTICS:

Mixed-effects linear regression models (Baayen et alii 2008), with:
-**participants** as random factor.
-**group, type of error** (segmental and stress related, lexical or morphological, position, morphological value), and **items' complexity** as independent factors.

Results

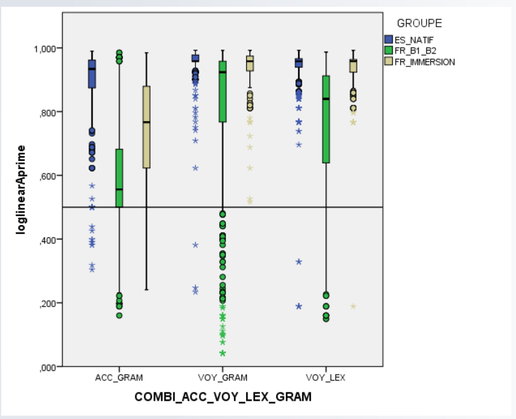

Fig 1. GROUP*ERROR TYPE (ACC_GRAM, V_GRAM, V_LEX)

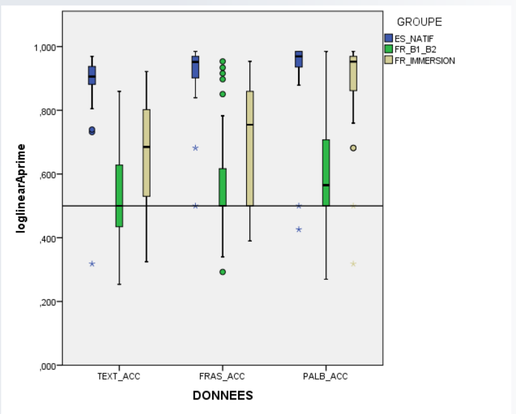

Fig 2. STRESS ERRORS: GROUP *COMPLEXITY (TEXT, SENTENCE, WORD)

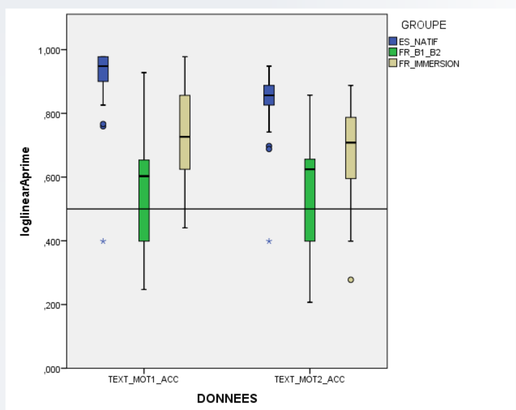

Fig 3. STRESS ERRORS: GROUP*POSITION (1st vs 2nd VERB)

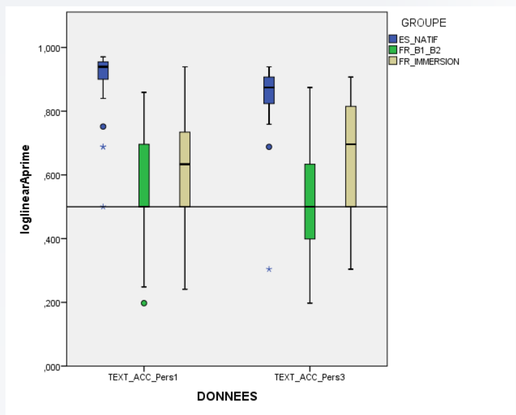

FIG 4. STRESS ERRORS: GROUP *MORPHOLOGICAL VALUE (Present 1st person vs Past 3rd person)

Conclusion

The intermediate learners performed poorer in all conditions.

1. Regarding error type (stress vs vocalic detection of incoherencies) post-hoc results (p<.05) revealed that:
-intermediate learners: almost no sensitivity.
-advanced learners and natives had no difficulties regarding vocalic errors.
-Even for controls, stress errors are more difficult to detect than vocalic errors.

2. Focusing on complexity effect on stress errors, post-hoc results (p<.05) showed that:
-intermediate learners: less sensitive than advanced learners and controls.
-advanced learners showed less sensitivity than controls for texts and sentences BUT almost same sensitivity than native on words.
-Controls: progression: TEXT_ACC < FRAS_ACC < PALB_ACC ↗
-B1-B2 and advanced: threshold between PALB_ACC and TEXT_ACC/ FRAS_ACC

3. Looking at the effect of position on stress errors, post-hoc results (p<.05) indicated that :
-intermediate learners showed less sensibility than advanced learners and controls.
-advanced learners and controls: sensibility to the first verb: effect of position
-the intermediate learners showed almost no sensitivity to the first or second verb.

4. Considering the effect of target stress pattern on stress errors, (interaction almost significant) the results pointed out that :
-intermediate learners showed less sensibility than advanced learners and controls.
-Controls: less sensibility to ACC_PERS3 than ACC_PERS1: effect of stress pattern /morphological most frequent form.
-advanced learners (tendency): less sensitivity to ACC_PERS1 than ACC_PERS3. Hypothesis: most frequent pattern of L1 best perceived when **violated.**

Future work: is there a difference between lexical and morphological values at stress level for advanced learners?

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