



On aspiration of voiceless stops in Lamezia Terme Spoken Italian

Terme Spoken Italian

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BACKGROUND - LITERATURE

Aspiration of voiceless stops, although absent in Standard Italian, is a phenomenon well attested in some southern dialects and in their corresponding Regional Italians, particularly in the Salento peninsula and in Calabria [1]; in the Italian areas affected by the phenomenon, aspiration of voiceless stops is not a phonemic feature (as in Thai, Korean or Hindi [7]), but is an allophonic feature (as in English, although in different contexts).

For Calabrian dialects aspiration has been noted by [4,10,12], but the dialectological classifications do not state clearly the contexts, the classes of consonants affected by the phenomenon and its geographical extension. According to [4], the phenomenon seems attested in the southern part of the region (Reggio Calabria), where aspiration affects the whole class of voiceless stops (/k/, /p/ /t/) in the following contexts:

1. Gemination ex. /rot:o/ [rut^h:u]
2. Preceded by a nasal ex. /konto/ [kunt^hu]
3. Preceded by a rhotic ex. /sarto/ [sart^hu].

BACKGROUND - SOCIOPHONETICS

In Calabria, aspiration of voiceless stops has been noted mainly in relation to the northern part of the region (district of Cosenza) [4, 10, 11], and, in brief, to the southern part (district of Reggio Calabria) [4]. Nevertheless, the linguistic consciousness of the speakers allows us to suppose that the phenomenon is more widespread, as to be considered a marker or even a stereotype of Calabrian dialects, especially for the central area (district of Catanzaro).

A preliminary sociophonetic investigation on the dialect of Lamezia Terme (central area) has, indeed, confirmed the hypothesis: a qualitative perceptual interview, based on speakers' estimations of dialectological differences between neighbourhoods, has shown that the aspiration of voiceless stops is considered one of the most important cues for the identification of the neighbourhood of origin.

RESEARCH QUESTIONS

The aim of the study is to provide a preliminary description of the phenomenon of aspiration of voiceless stops in the Italian spoken in Lamezia Terme. In particular, it tries to shed light on the following points:

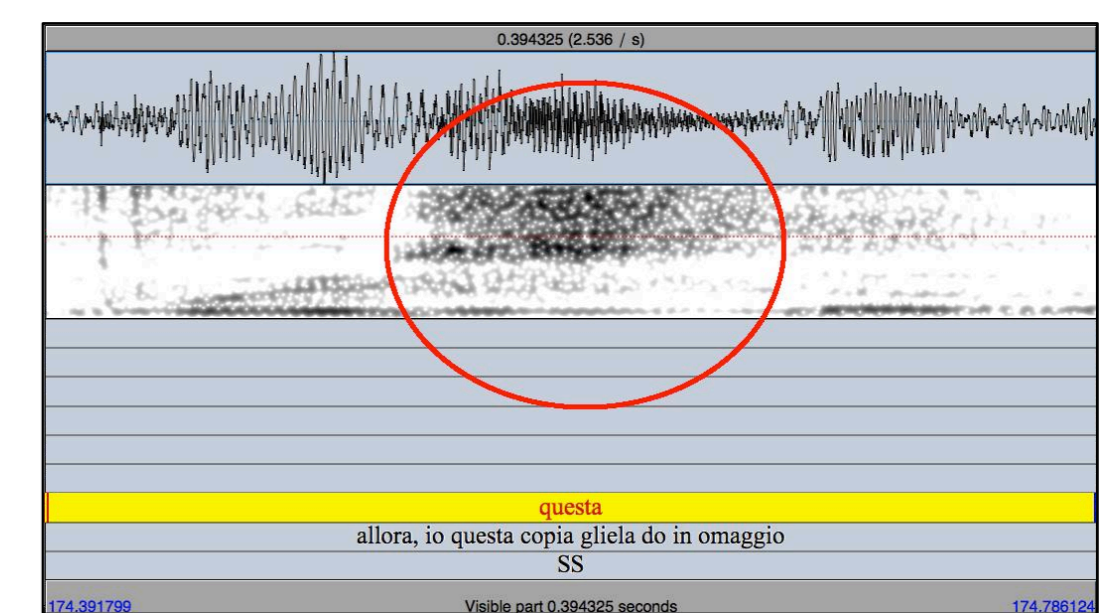
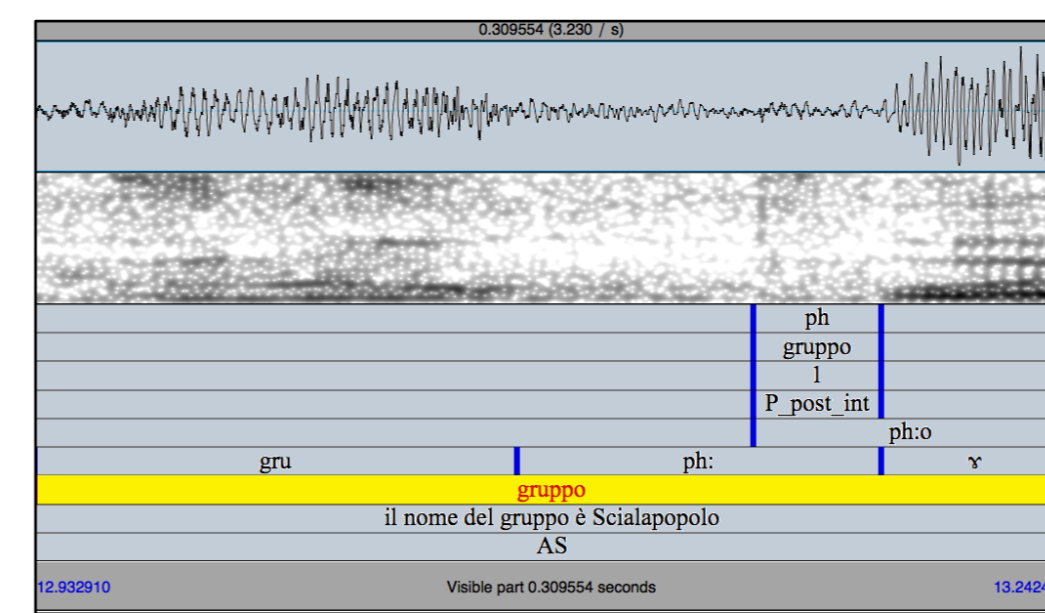
1. What are the acoustic characteristics of aspiration in Lamezia Terme spoken Italian?
2. What are the contexts that govern the presence of aspiration, and in which way do they affect aspiration?
3. Is there any inter-generational and inter-gender difference in the realisation of aspiration?

EXPERIMENTAL DESIGN

- **Speakers:** four speakers, sorted by age (young/old) and gender, from the neighbourhood of Nicastro (Lamezia Terme), interviewed *in loco*
- **Corpus:** spontaneous speech passages of ca. 1 hour for each speaker recorded with an Edirol R-09HR Portable Recorder direct to .wav format (44.1kHz / 16-bit)
- **Dependent Variable:** duration (in msec) of Voice Onset Time (VOT)
- **Factors:**
 - PLACE OF ARTICULATION (bilabial /p/, dental /t/, velar /k/)
 - CONTEXT:
 1. gemination, ex. /grup:o/ [grup^h:o]
 2. after rhotics, ex /parte/ [part^hi]
 3. after nasals, ex /kanto/ [kant^hu]
 4. after sibilant, ex /kostume/ [kostumi]
 5. after laterals, ex /molto/ [molt^hu]
 - FOLLOWING VOWEL (stressed/unstressed)
 - AGE
 - GENDER

Data Preparation and Segmentation Criteria:

- ✓ 401 tokens of voiceless stops in one of the five possible contexts labelled in Praat for stop release, vowel onset, vowel offset, and annotated with information on stress, place of articulation and context
- ➔ lack of information about stop closure duration due to the nature of the corpus (presence of noise in the recordings)
- ✓ Durational measures for VOT considering the interval between the burst and the onset of vocal fold vibrations [6] taken at zero crossing; discarded tokens where the burst was unclear
- ➔ High number of tokens in context 4 (/sC/) discarded: absence of burst / assimilation



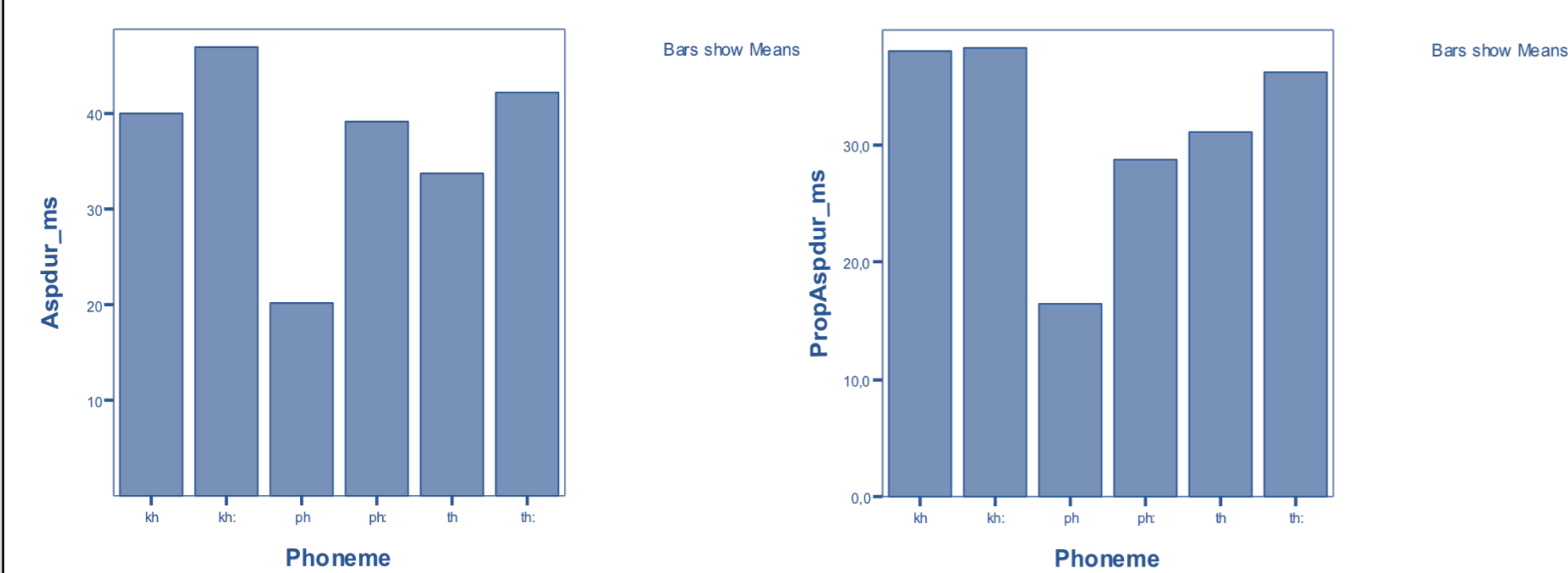
Effects of speech rate on Voice Onset Time [5, 9]: increased Voice Onset Time with slower speech rate in aspirated and voiced stops
Effects of aging on Voice Onset Time [3, 9]:
Shorter VOT duration in older speakers due to the effects of aging on the larynx

- ✓ Normalization for speech rate: VOT + vowel = 100%. Calculated the proportional duration of VOT
- ➔ Unbalanced nature of the corpus: few tokens in context 5. First run on ANOVA with context 5, second run with context 5 discarded.
- ✓ Consonants were considered aspirated if their VOT values were over 30 msec [11]

RESULTS

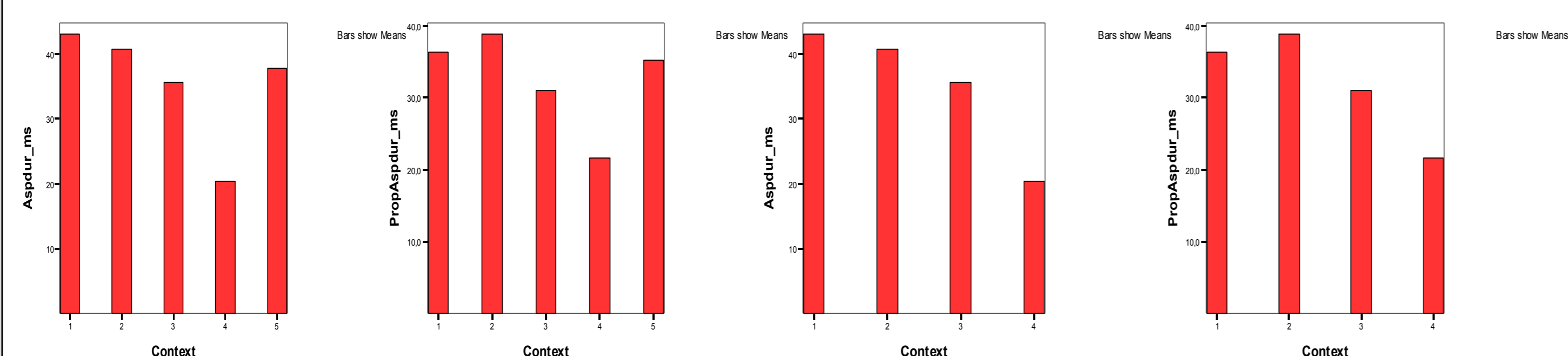
All the considered factors (place of articulation, context, stress on the following vowel, age and gender) resulted statistically significant ($p < 0.005$) in determining the duration of VOT.
N. B. The graphs show on the left the results before normalization, and on the right the results after normalization for speech rate

1. PLACE OF ARTICULATION

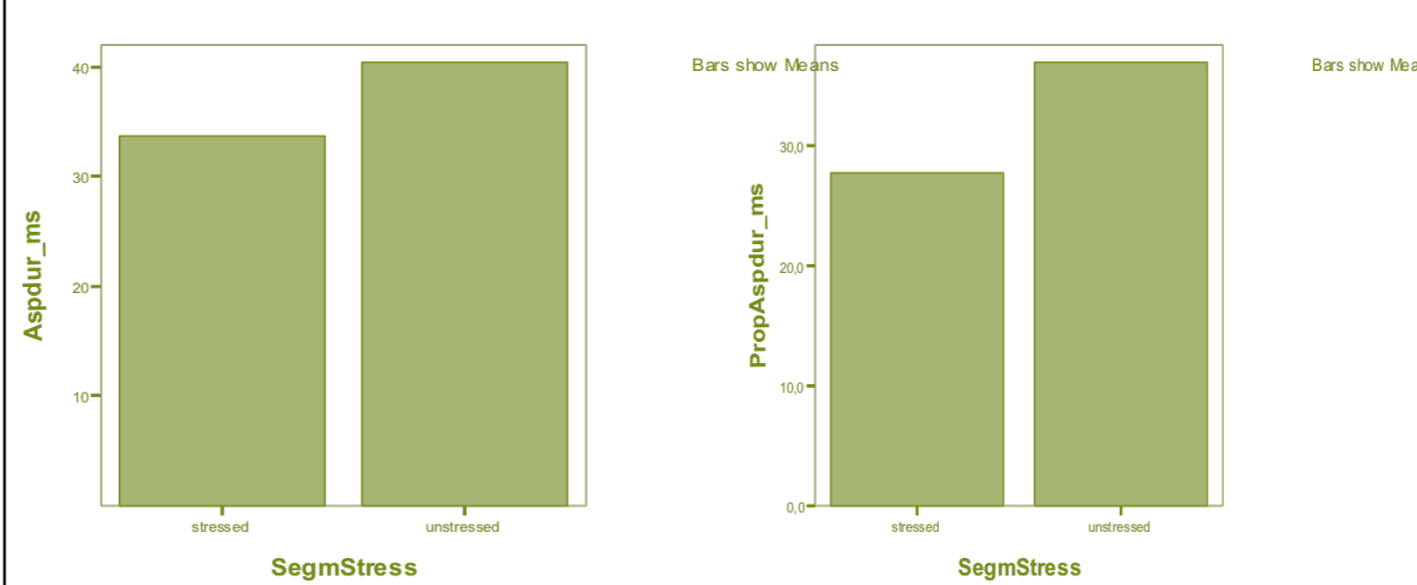


2. CONTEXT

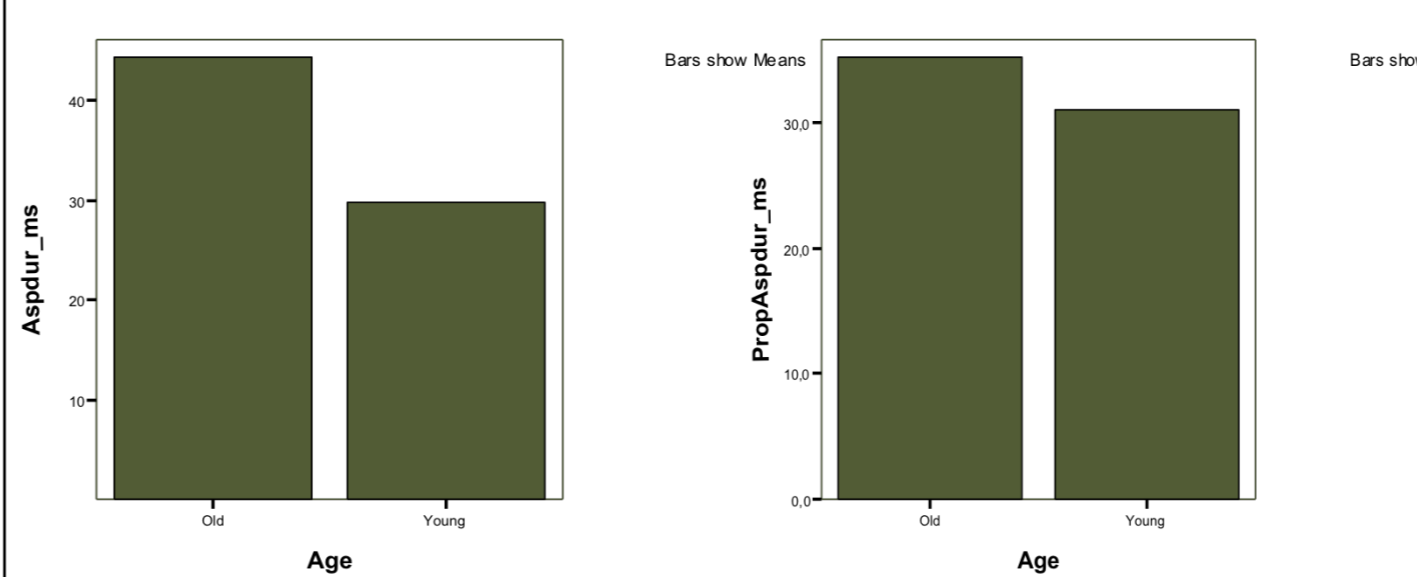
N.B. First couple of graphs with context 5, second couple with context 5 discarded



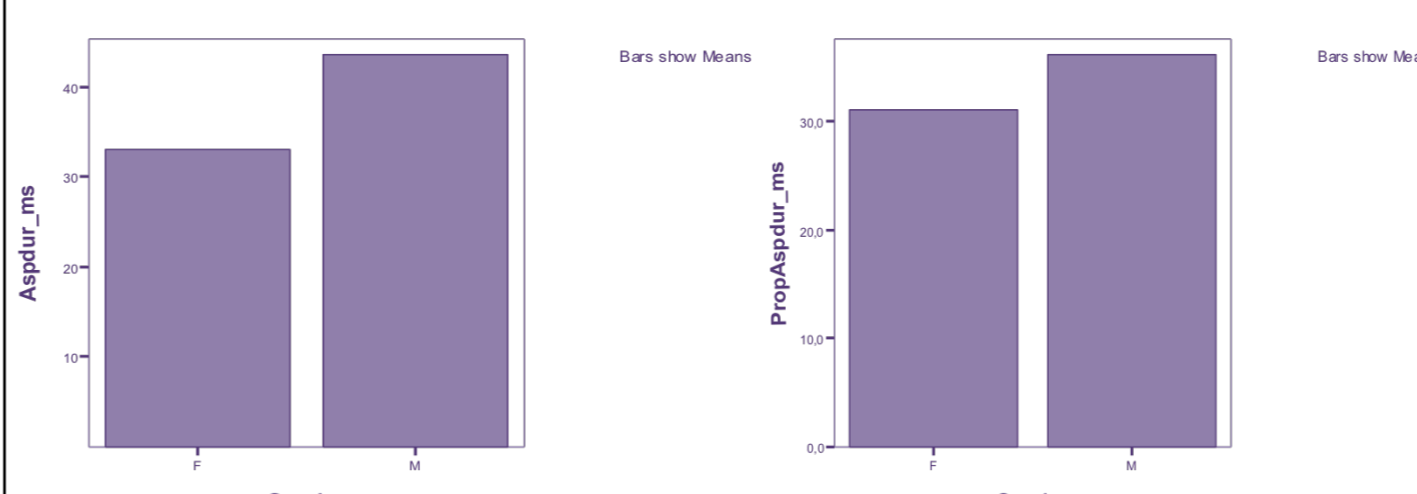
3. STRESS



4. AGE

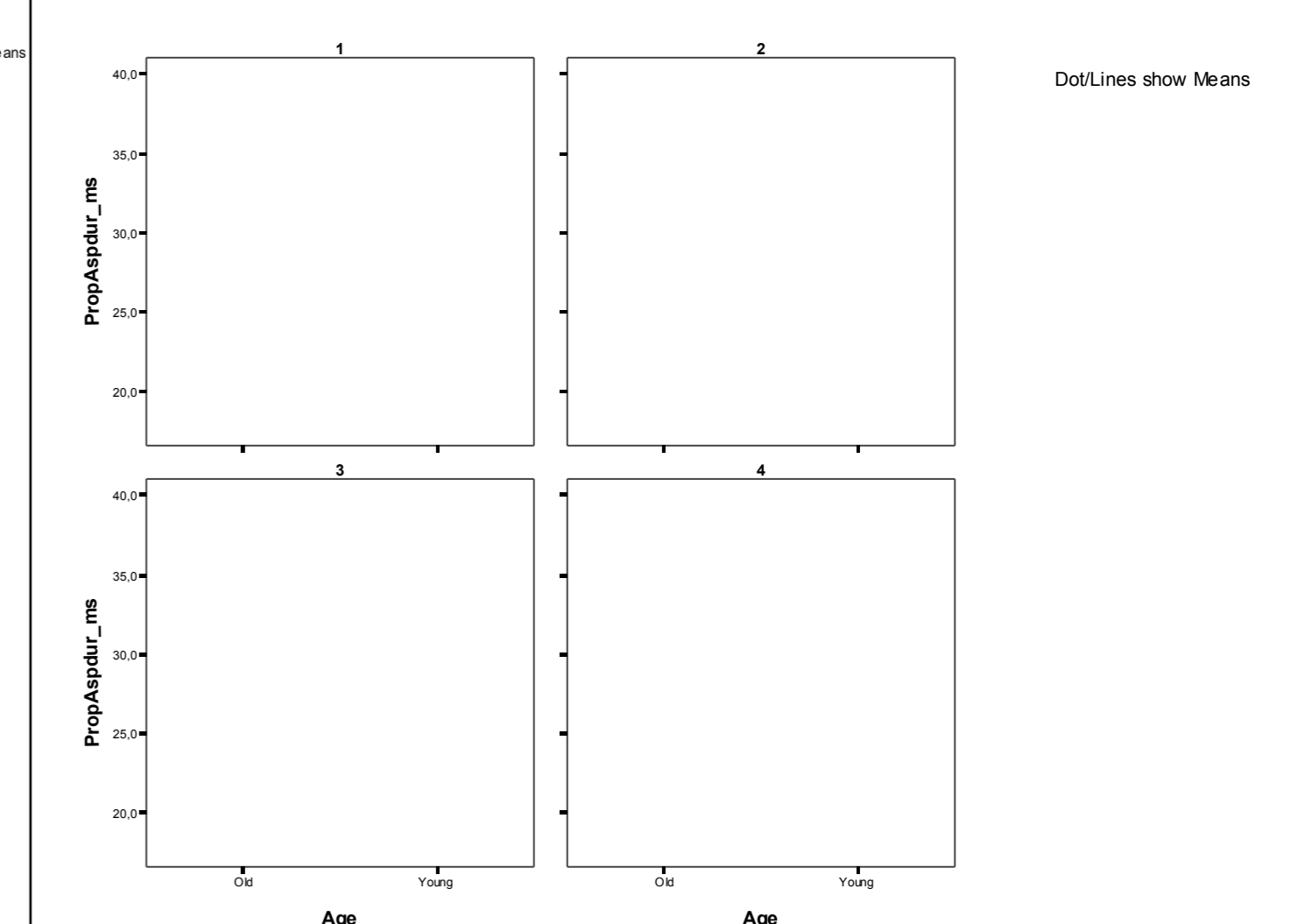


5. GENDER



◆ FOCUS ON: CONTEXT

Post-hoc Hochberg test on context shows that context 4 acts in a significantly different way ($p < 0.005$) in comparison with other three contexts. Tests of between-subjects effects shows also that the interaction of stress*context is statistically significant ($p < 0.005$), compared to the interaction with stress*phoneme ($p > 0.005$). After normalization, the two age groups show a difference in the values of VOT but they are both consistent in showing no aspiration in context 4.



CONCLUSIONS

- The results confirm the observations on VOT conducted by [2, 8], with longer VOT affecting the class of voiceless velar stop.
- After normalization, the effect of stress, with shorter VOT in stressed syllables, can be easily correlated with the longer duration of the stressed vowel. Nevertheless, the effect of non-normalized data suggests that we need further investigation on the role of lexical stress in the duration of VOT.
- The analysis conducted on the effect of context shows that the aspiration does not occur only in the contexts listed by [4, 11], but seems to occur also after a lateral consonant. Differently, context 4 (preceding sibilant) does not seem to activate aspiration. This observation may lead us to consider aspiration as in strict correlation with the nature of the preceding syllable, with closed favouring aspiration, ex. [kan.t^hu]. The absence of aspiration in /sC/ clusters can be considered as an additional evidence of the undecidable syllabification of /sC/ clusters.

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