

Intonation Variation in Arabic

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**Peak Alignment in Jordanian Formal and Colloquial
Arabic**

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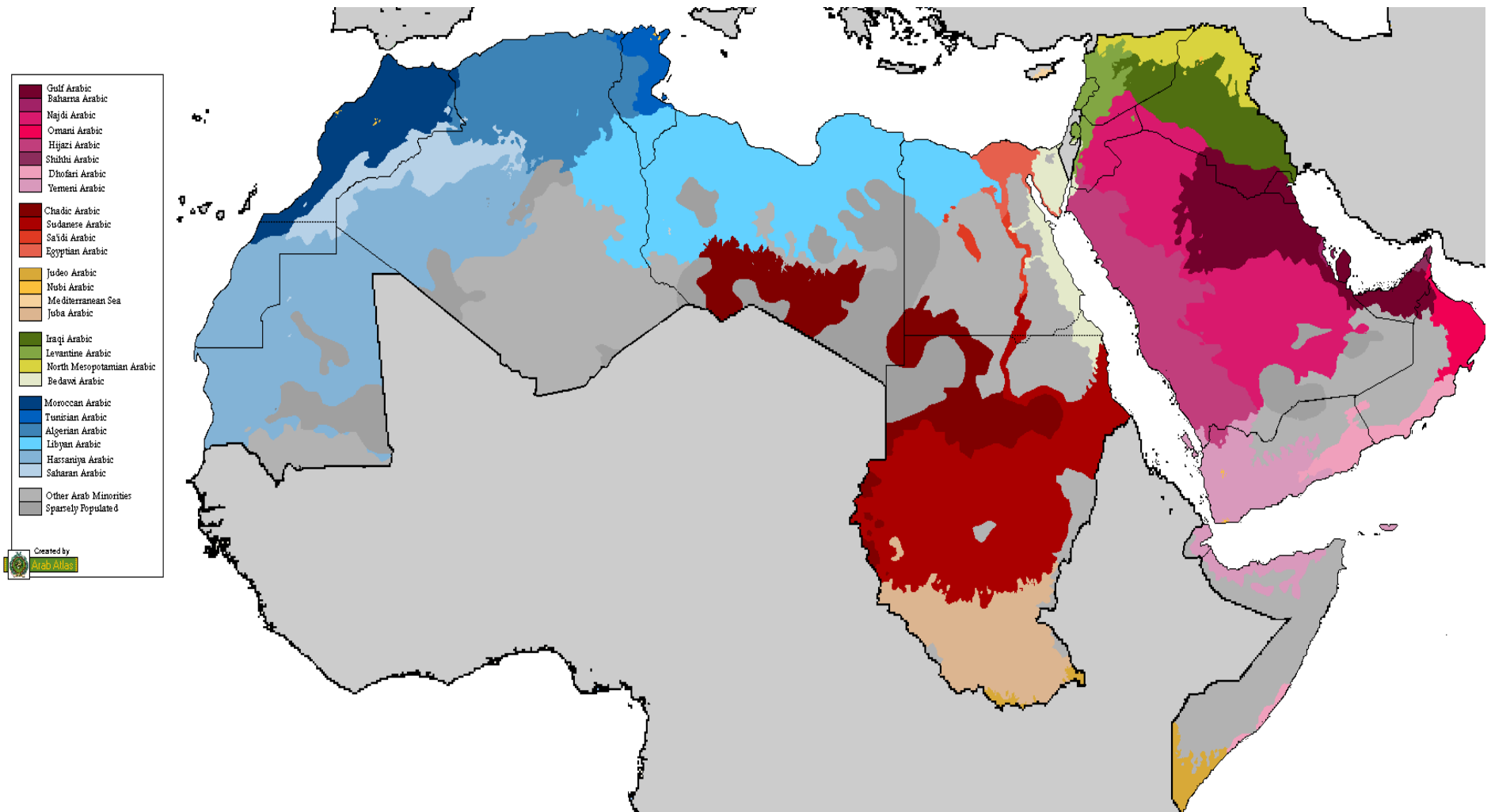
Map of the Arabic Speaking world



Location of Jordan within the Arabic Speaking World



Regions of Arabic Dialects



Experiment: Aim

- It has been reported that the intonational pattern used in Formal Arabic, *fusha*, reflects that of the Colloquial 'spoken', *amiyya*, Arabic dialect of the speaker. This seems to be the case in Jordanian Arabic. The phonological **tonal pattern** of statements in Jordanian Formal Arabic (JFA) and Jordanian Colloquial Arabic (JCA) is a sequence of H*+L pitch accents followed by a low boundary tone L-L%.
- This pilot study investigates the phonetic realization of the **peak alignment** in (H*+L) pitch accent across these two registers of Jordanian Arabic.
- Peak alignment is investigated in both **nuclear** and '**initial**' **pre-nuclear** positions in the IP.
- One of the factors reported to have influence on peak alignment is the **prosodic context**, particularly the proximity to other pitch accents and prosodic boundaries. In this study, peak alignment is investigated by manipulating **the number of 'unstressed' syllables after the nuclear pitch accent** and **before the 'utterance-initial' pre-nuclear pitch accent**.

Experiment: Speakers

- Two Jordanian females SK and DA (aged 39 and 28, respectively) who are raised and educated in the capital city of Jordan, Amman.
- The speech investigated represents that of **Ammani 'educated' Jordanian Arabic**. Both speakers are mother tongue speakers of Jordanian Colloquial Arabic (JCA).
- Both speakers have university level education in the grammar of *fusha*, and are fluent speakers of Jordanian Formal Arabic (JFA).

Experiment: Materials & Methodology (1)

- Three sentences were controlled for the number of unstressed syllables following the nuclear accent, varying from zero (N0) to two (N2):
 - **N0:** a'nnamlu jata'ʒaða: ʕalal 'mann (JFA) (*ants feed on aphids*)
 fi: ʕal ward əl zu:ri 'mann (JCA) (*there are on roses aphids*)
 - **N1:** 'marrat min 'huna: 'namla (JFA) (*passed from here an ant*)
 'marrat min 'ho:na 'namlə (JCA)
 - **N2:** 'ʃtarat 'marjamun 'mamlaha (JFA) (*bought Maryam a salt shaker*)
 & na:'waltu 'marwa:n al 'mamlaha
 na:'walt 'marwa:n əl 'mamlaha (JCA) (*I gave Marwan the salt shaker*)
 & 'marwa:n ʃara 'mamlaha

Experiment: Materials & Methodology (2)

- Four sentences were controlled for the number of unstressed syllables before the pre-nuclear accent, varying from zero (0PN) to three (3PN):
 - **0PN:** 'namlatun 'marrat min 'huna (JFA) (*an ant passed from here*)
 'namlə 'marrat min 'ho:n (JCA)
 - **1PN:** a'nnamlu mu'majjazun fil ʕamal (JFA) (*ants are unique at work*)
 ɪ'nnamlə ma: bi'tʔtʔi:r zai i'nnaħlə (JCA) (*an ant doesn't fly like a bee*)
 - **2PN:** mina 'nnamli an'wa:ʕun mu'majjaza (JFA) (*there are unique kinds of ants*)
 fi:ha 'namlə 'lo:nha 'binni (JCA) (*inside it is an ant whose colour is brown*)
 - **3PN:** huna:ka 'namlun ʕala'mindi:li da'la:l (JFA) (*there are ants on Dalal's scarf*)
huna:ka 'namlə ʕala 'marju:l da'la:l (JCA) (*there's an ant on Dalal's apron*)

Experiment: Materials & Methodology (3)

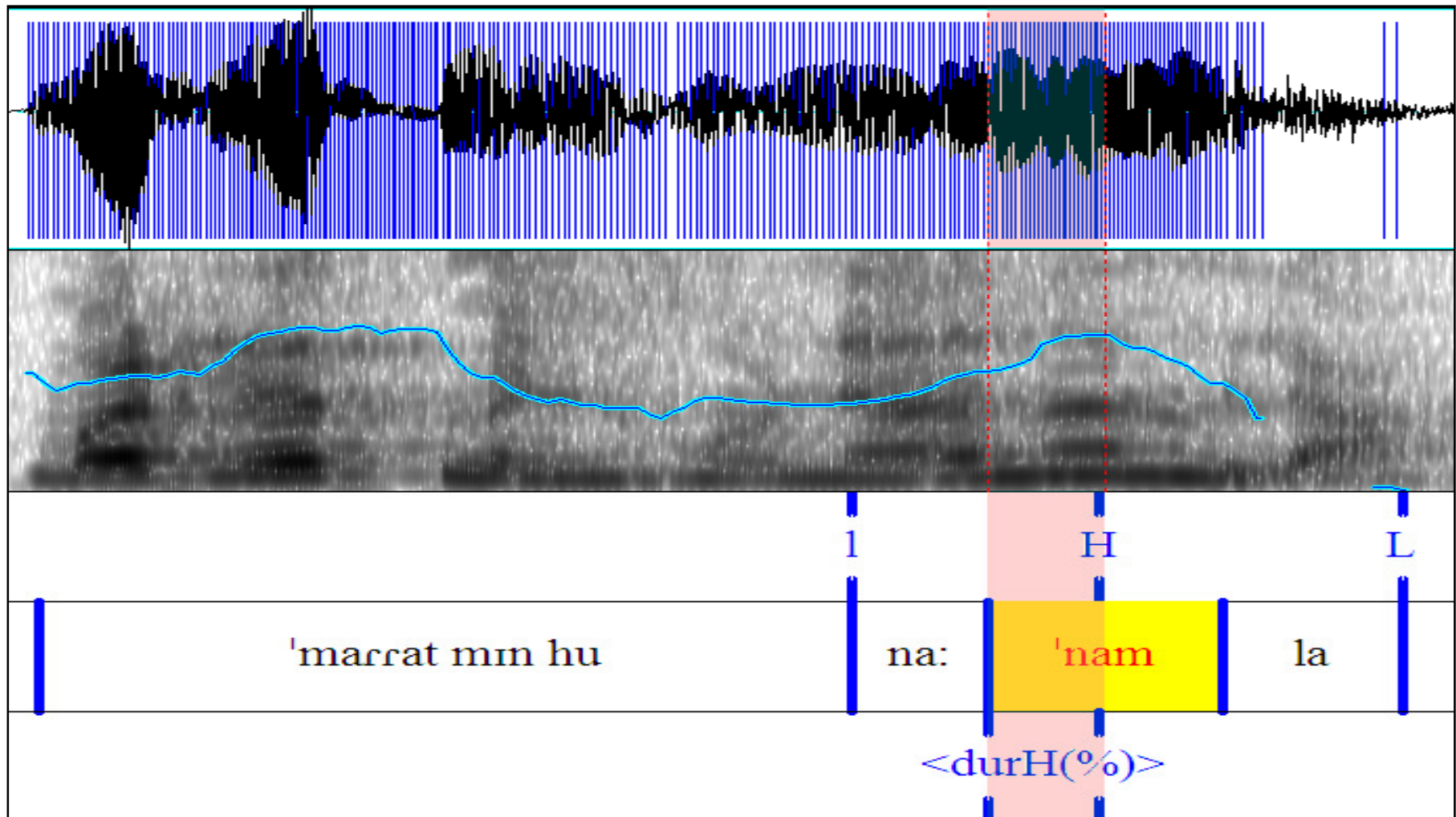
- The pitch-accented syllable in all sentences is the CVC syllable /nam/
(except for /mann/ in N0 condition, /mam/ in N2 condition, and /nnam/ in 1PN condition).
- The data was recorded in a quiet room using a digital recorder and was analyzed using PRAAT software.
- Each speaker read three randomised repetitions per sentence from a computer screen. There were 48 fillers sentences (used for a further study) read by each speaker. The total number of the analysed sentences for this study is:

2 speakers x 2 registers x 7 conditions x 3 repetitions = 84

Experiment: Measurements (1)

- The averaged durations of the controlled unstressed syllables and of the accented syllables were calculated (in milliseconds)
- Two measurements were taken:
 - **durH**: the distance from the beginning of the accented syllable to the peak position (in milliseconds)
 - **durH(%)**: the percentage of durH relative to the duration of the accented syllable

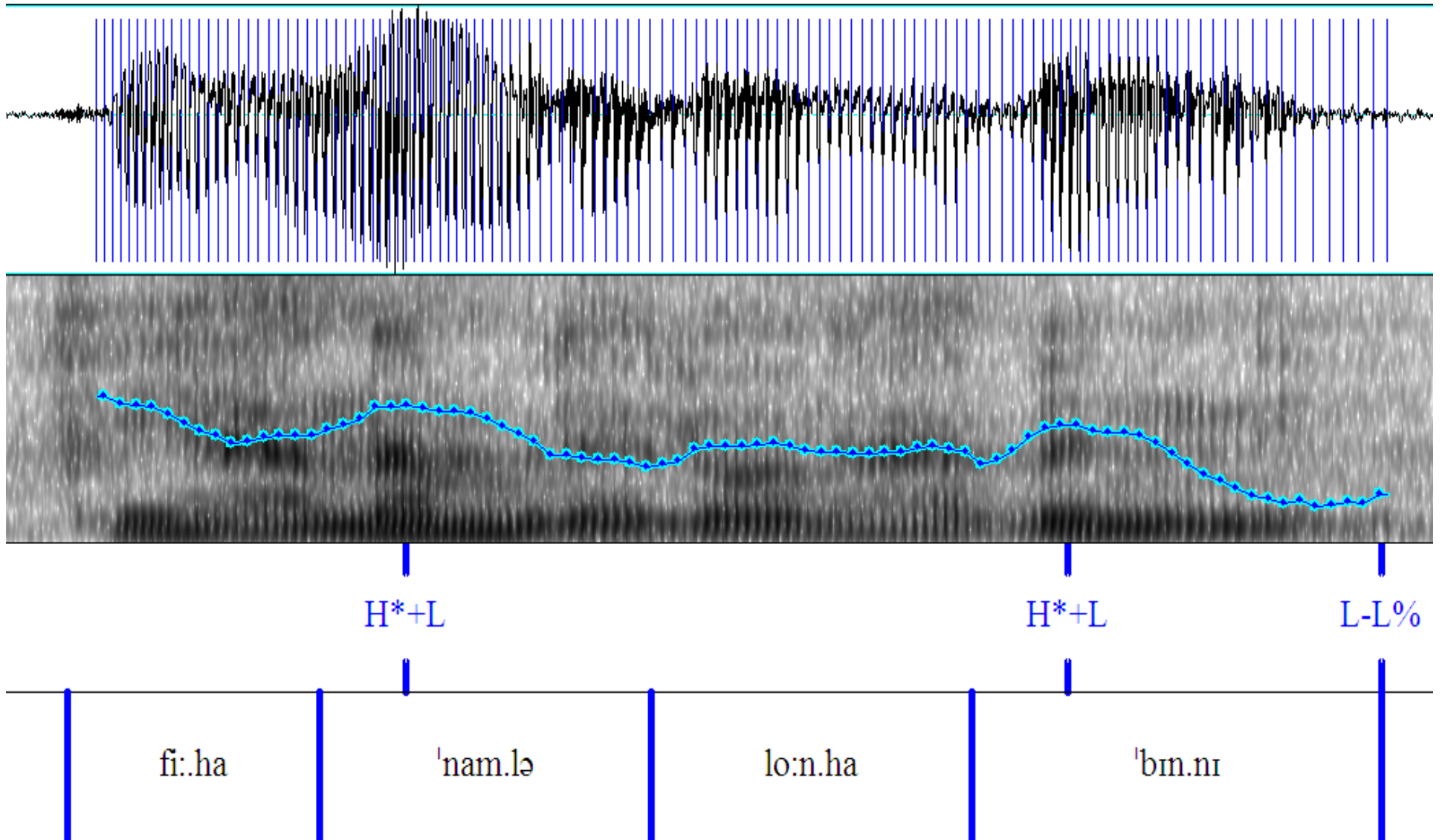
Experiment: Measurements (2)



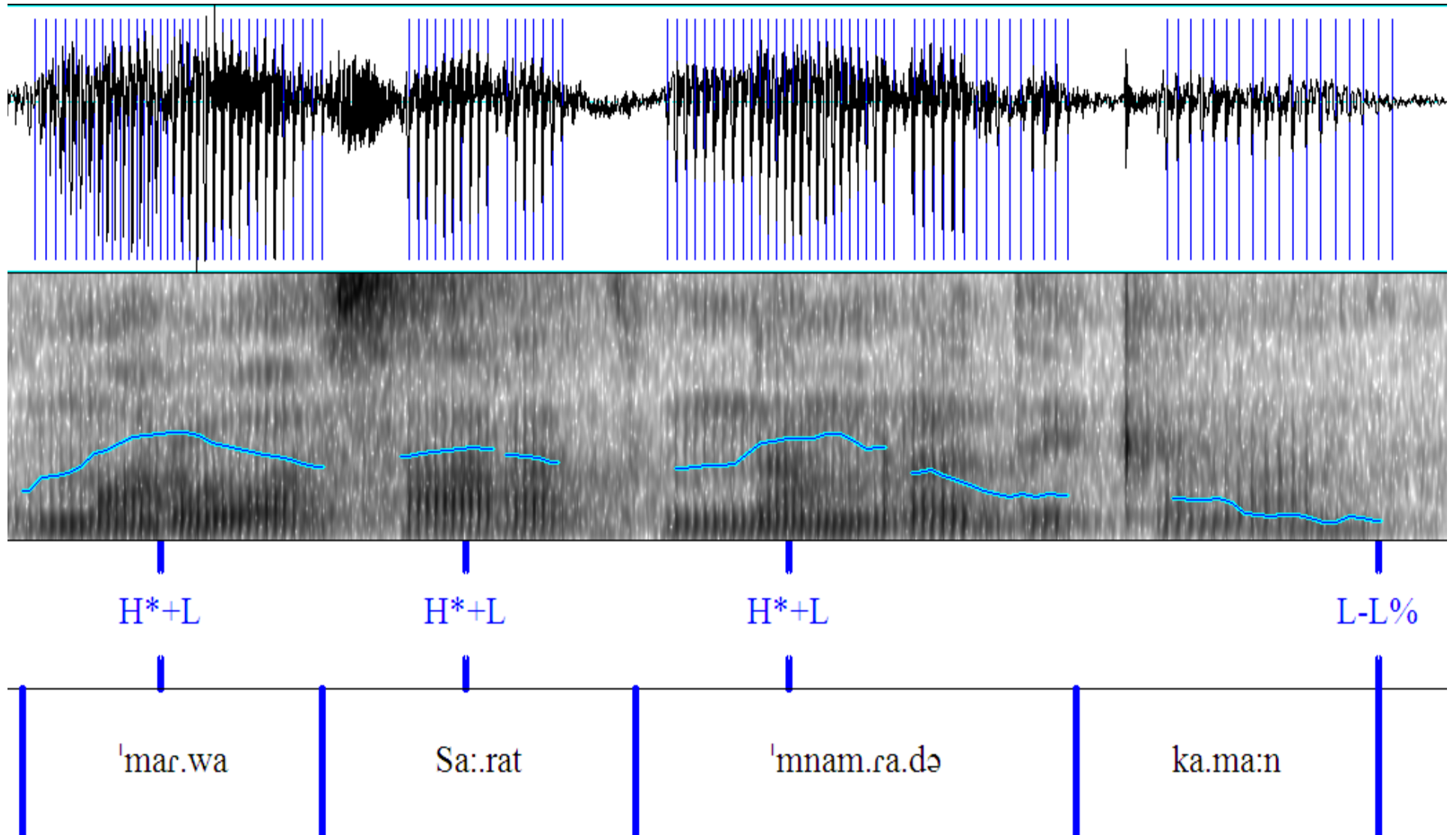
An illustration of the durH (%) measurement shown in the N1 condition in (JFA)
 (l) is minimum F0 before the peak (H) and (L) is the minimum F0 after (H)



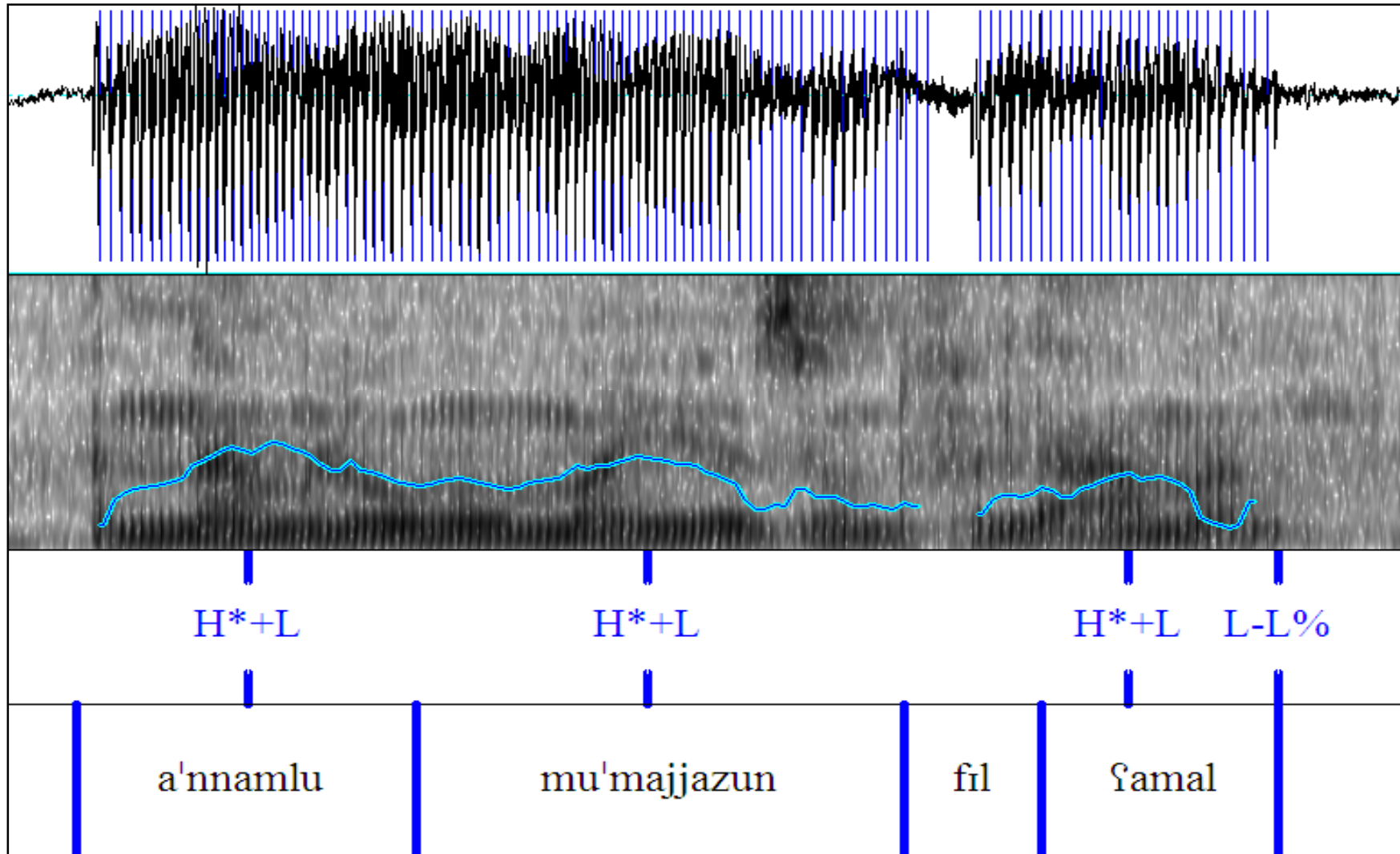
Tonal Pattern of Jordanian Colloquial Arabic (1)



🔊 Tonal Pattern of Jordanian Colloquial Arabic (2)

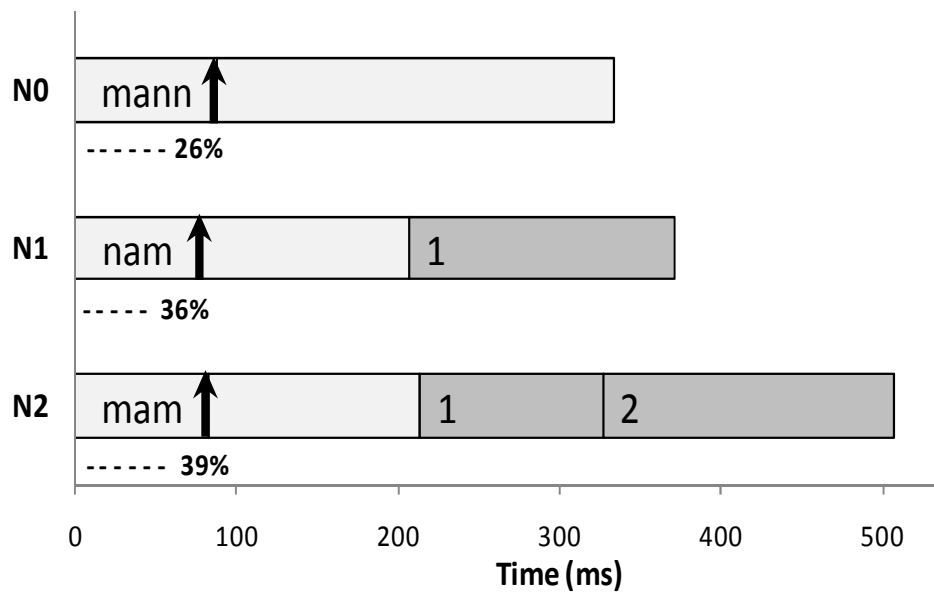


🔊 Tonal Pattern of Jordanian Formal Arabic (3)

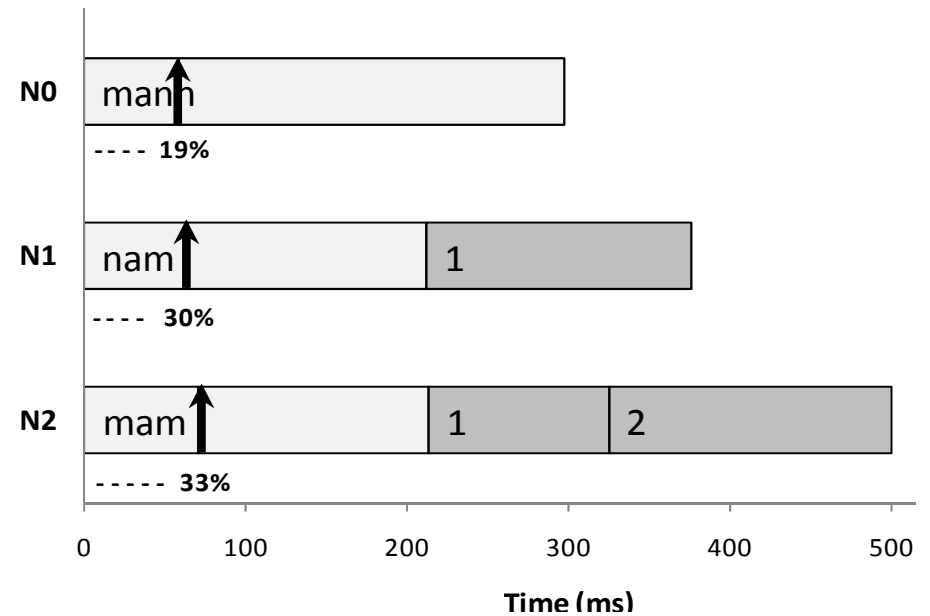


Results: Peak Alignment in Nuclear Position

(JFA)



(JCA)



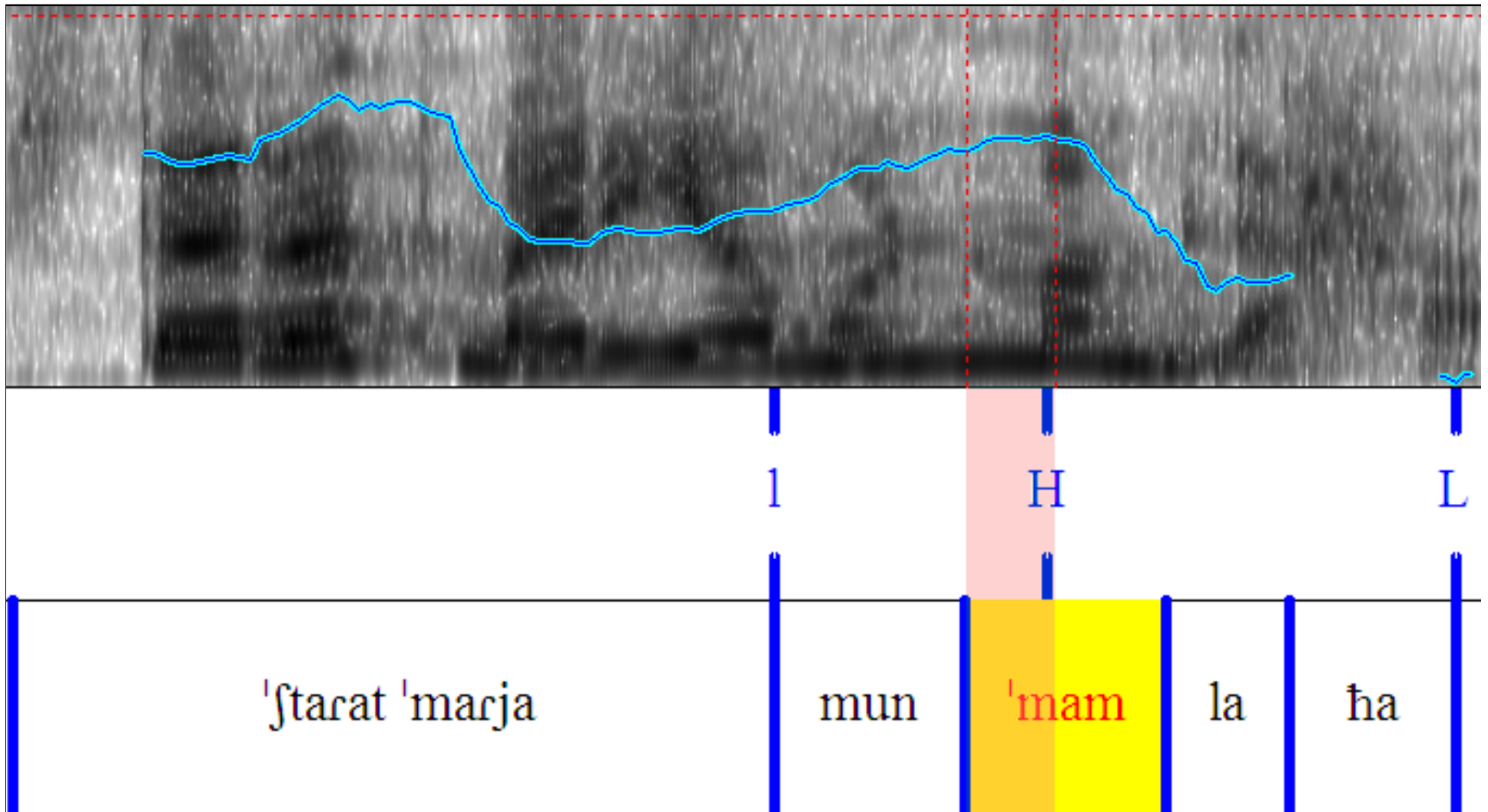
↑ = peak (H)position

= accented syllable

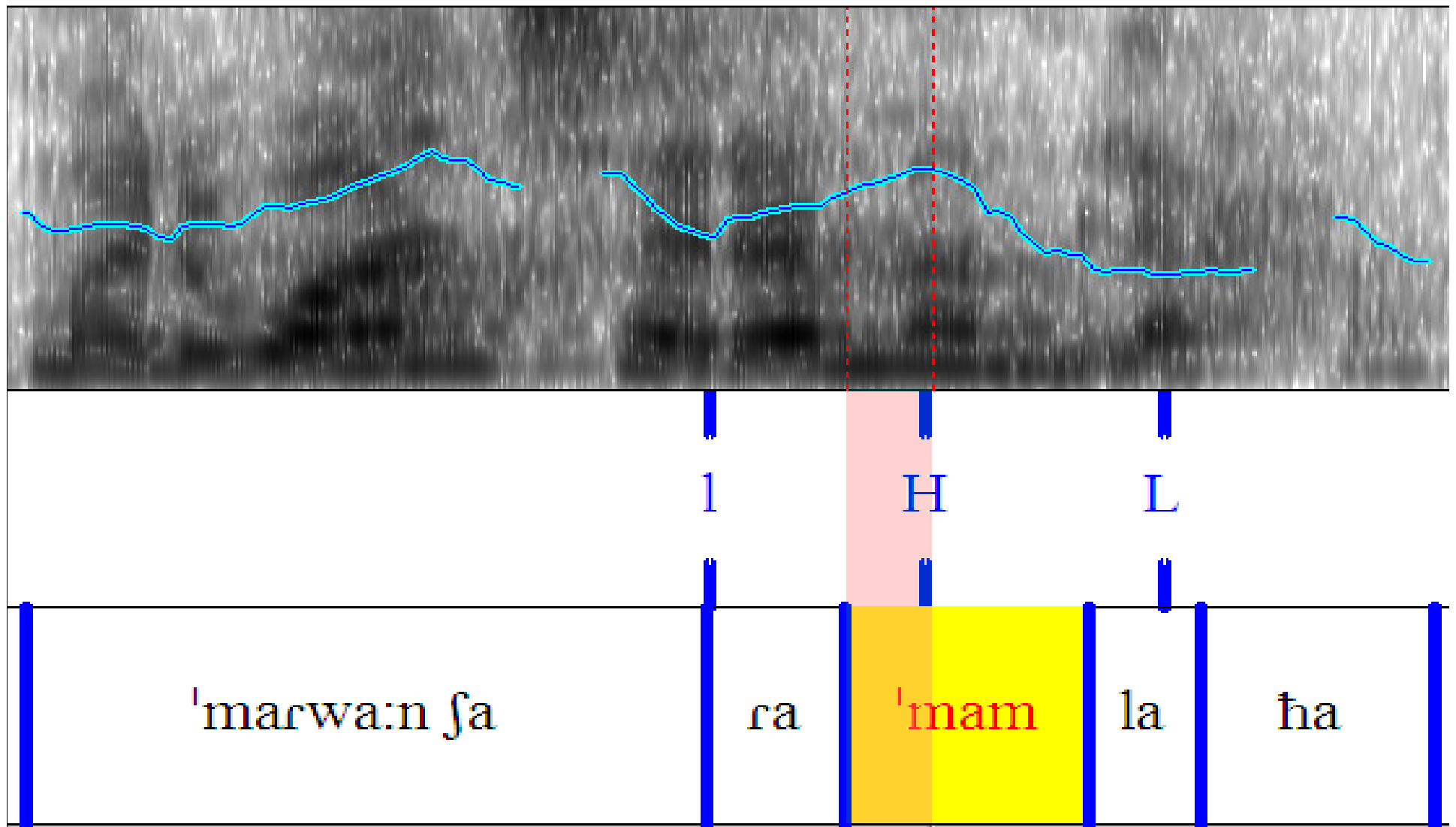
= unstressed syllable

durH(%) = peak alignment relative to the duration of the accented syllable

🔊 Results: Peak Alignment in Nuclear Position (JFA)

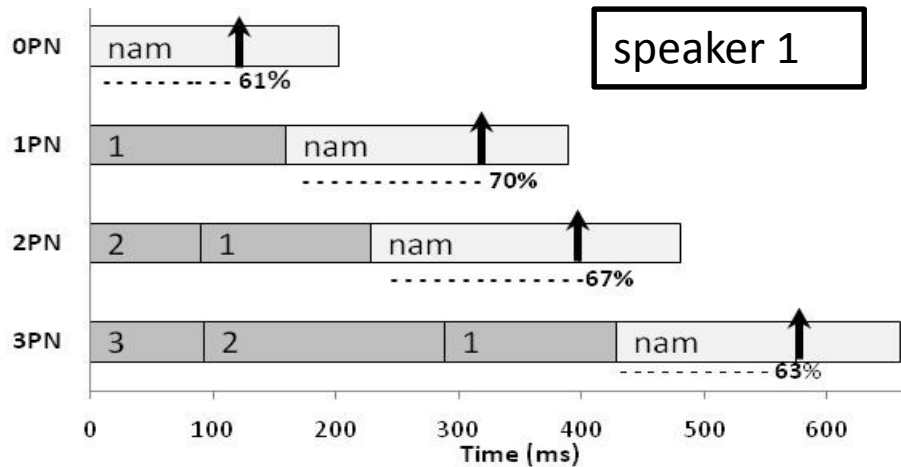


🔊 Results: Peak Alignment in **Nuclear Position (JCA)**

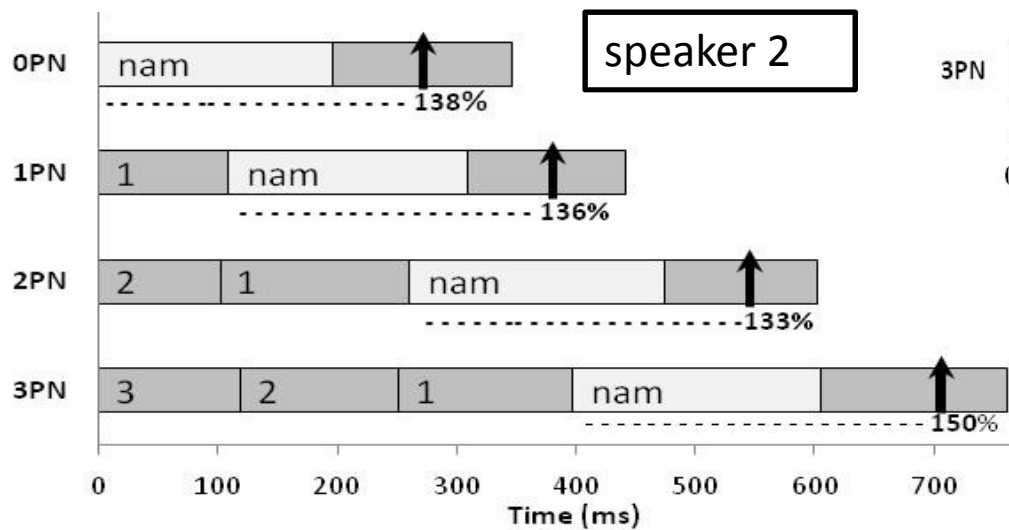
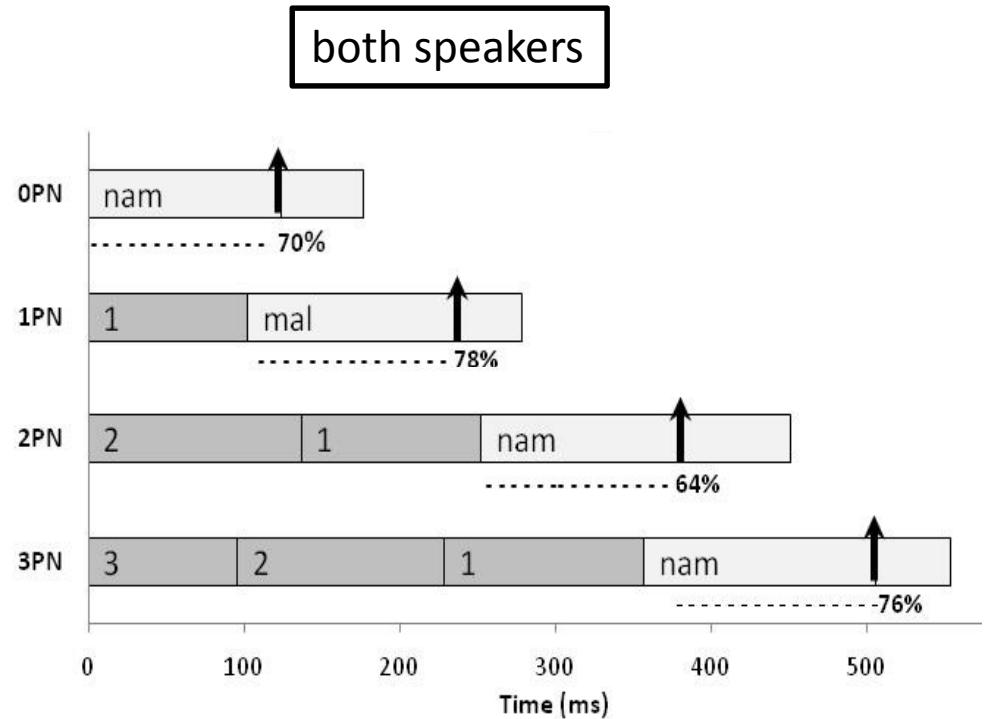


Results: Peak Alignment in Pre-nuclear Position

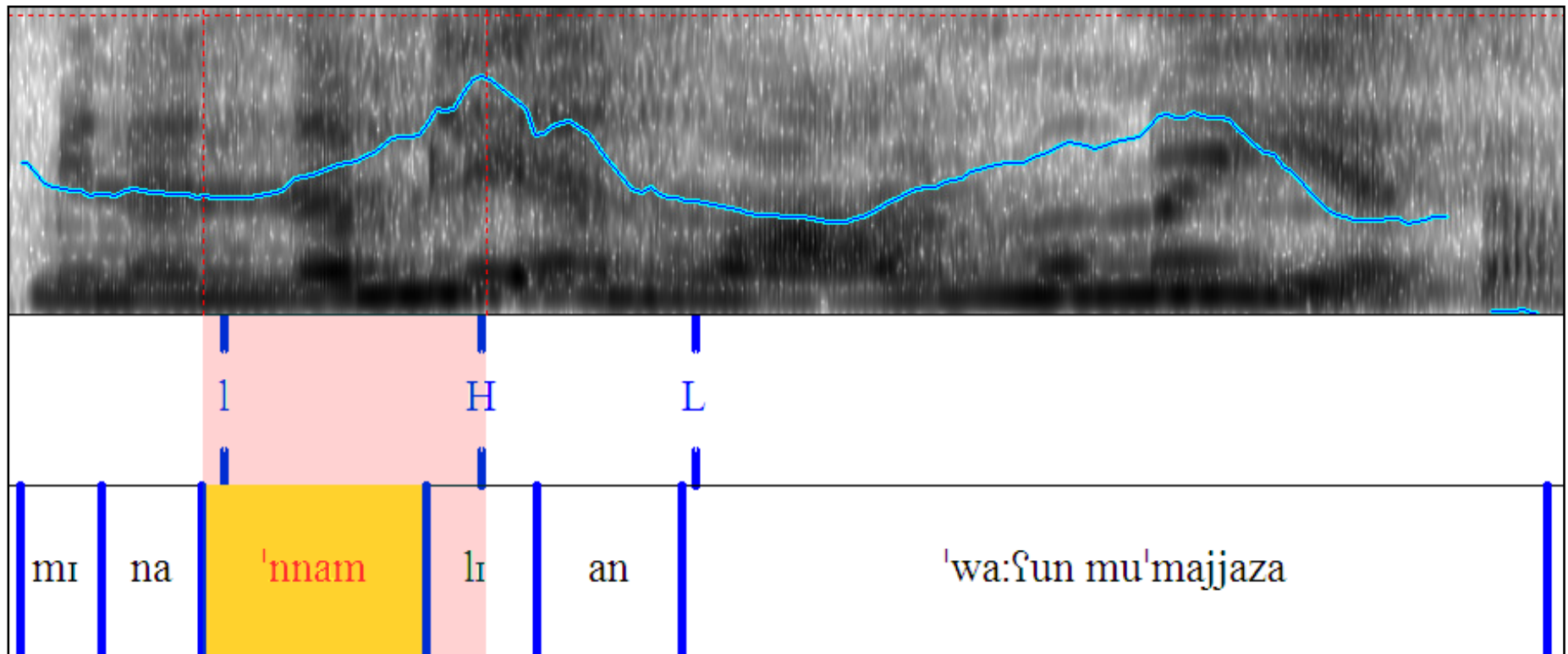
(JFA)



(JCA)



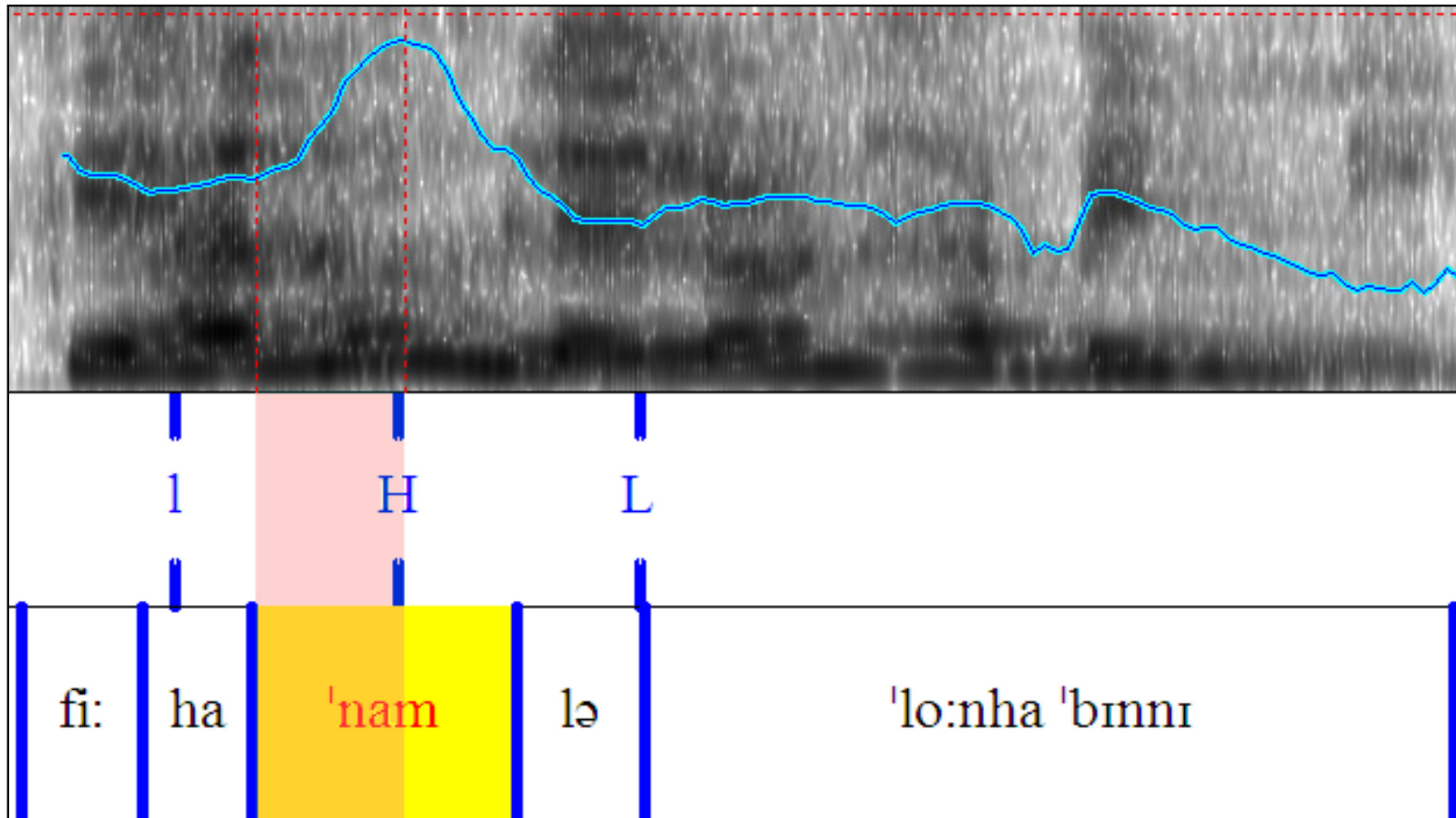
Results: Peak Alignment in **Pre-nuclear Position (JFA)** speaker 2



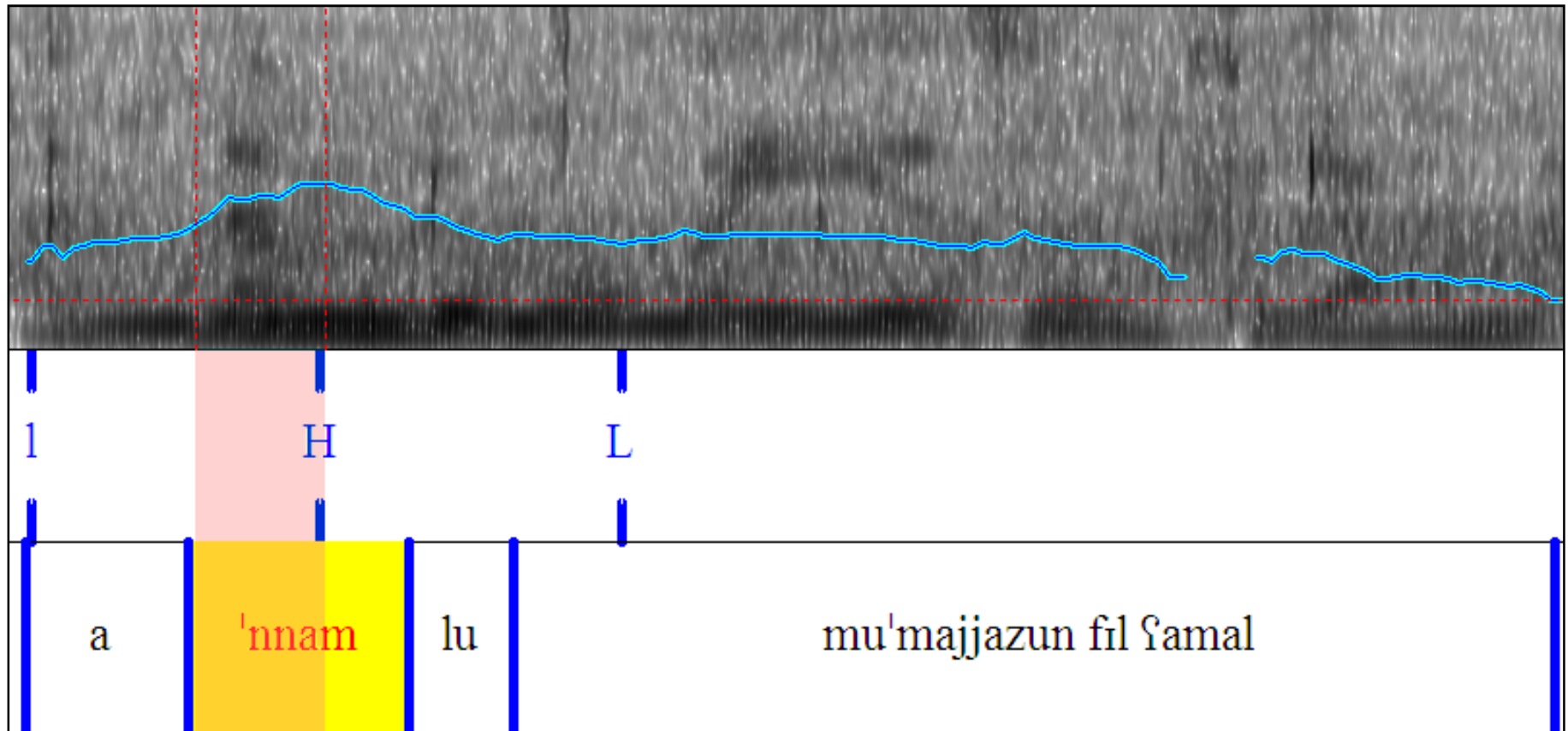
Results: Peak Alignment in Pre-nuclear Position (JCA)



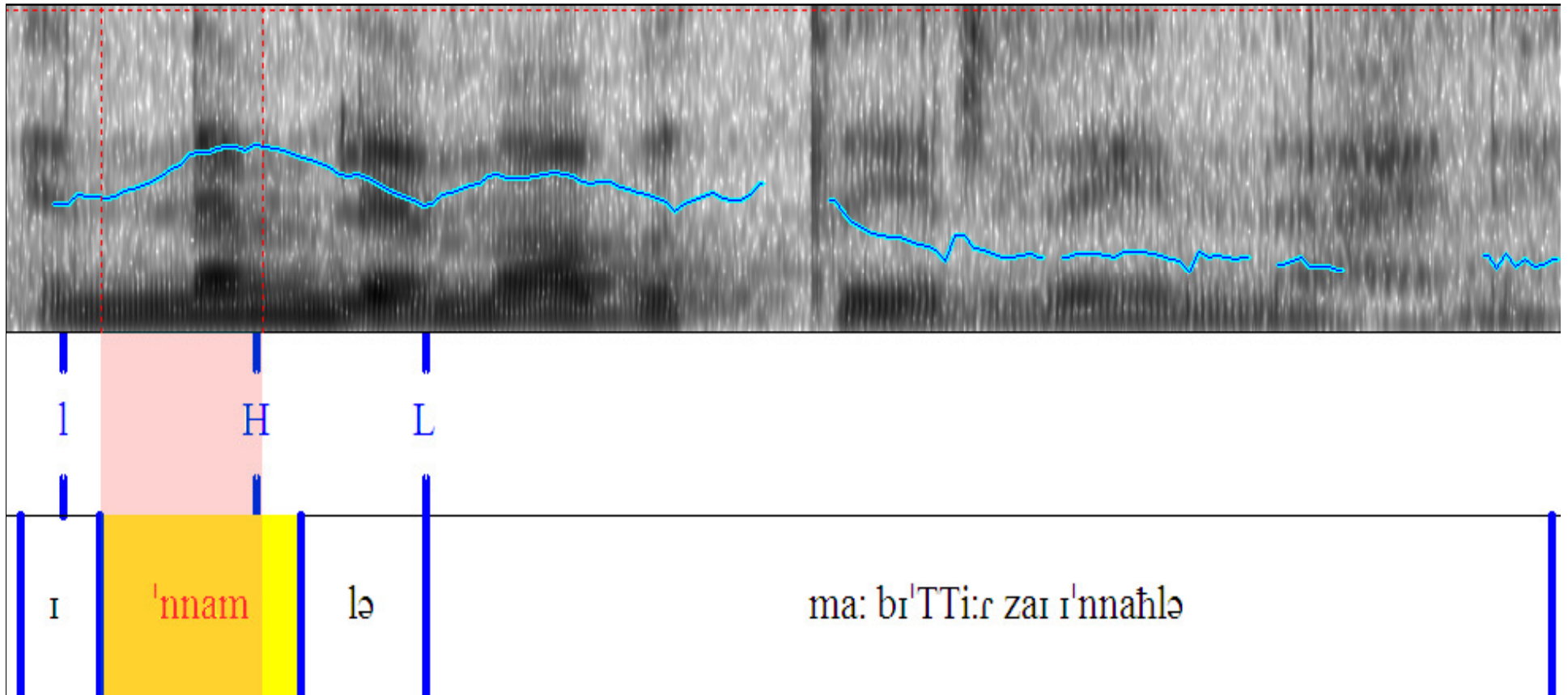
speaker 2



Results: Peak Alignment in **Pre-nuclear Position (JFA)** speaker 1



Results: Peak Alignment in **Pre-nuclear Position (JCA)** speaker 1



Conclusion (1)

- There is a broadly similar **phonetic realization** in both registers. **Peak alignment is fairly stable** within the pitch-accented syllable, regardless of the number of unstressed syllables following the nuclear accent or preceding the initial pre-nuclear accent. Speaker 2, though, had delayed peaks realized within the following unstressed syllable, particularly in pre-nuclear accents in JFA.

Conclusion (2)

- The analysis suggests that similar to previous alignment studies, the **peaks in nuclear accents are earlier than in pre-nuclear ones.**
 - In nuclear accents the peak usually falls at the C|VC boundary (beginning of the vowel /n|am/) in both JFA and JCA. Sometimes, speaker 2 would have the peak later in the pitch-accented syllable (usually within the vowel) particularly in JFA.
 - In pre-nuclear accents, the peak usually falls at the CV|C boundary of the pitch-accented syllable (after the vowel /na|m/) in both JFA and JCA . In the formal register **speaker 2 has delayed peaks which fall in the following unstressed syllable.** This suggests that although speakers have the same tonal pattern in both JFA and JCA, some may 'put on' an artificial feature when using the formal register which can be detected in the fine timing of the peak alignment.

شكراً

/ʃukran/

Thank you!