

The Role of Quantity Sensitivity in the Perception of English Lexical Stress by Predictable-stress Language Speakers: Arabic L2 Learners of English



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Introduction

- Stress predictability impedes listeners from perceiving the location of stress [2,4].
- Recent cross-linguistic studies (e.g. [4]),
 - Predictable fixed stress (e.g., Turkish) vs. unpredictable variable stress (e.g., English)

stress deaf

perceive stress

Research Question

- What about languages with stress that is variable but predictable?
 - Arabic: variable stress position, predictable quantity sensitive

Goals

- Compare stress perception by Arabic & English speakers.
- Determine to what extent QS affects stress perception?

Background

Quantity-sensitive Stress in Arabic

- Stress is assigned to the rightmost heavy syllable (i.e. CVV, CVC)
- A final syllable should be superheavy to be stressed (i.e., CVVC, CVCC).
- E.g. [mu.'dar.ris] 'teacher', [ba.'naat] 'girls'

Previous studies

- Altmann(2006)[1]: languages with predictable (fixed and QS) stress performed more poorly in stress perception than speakers with unpredictable or no stress.
- Neurolinguistic studies: Arabic participants were insensitive to violations when stress was on a heavy syllable [3].

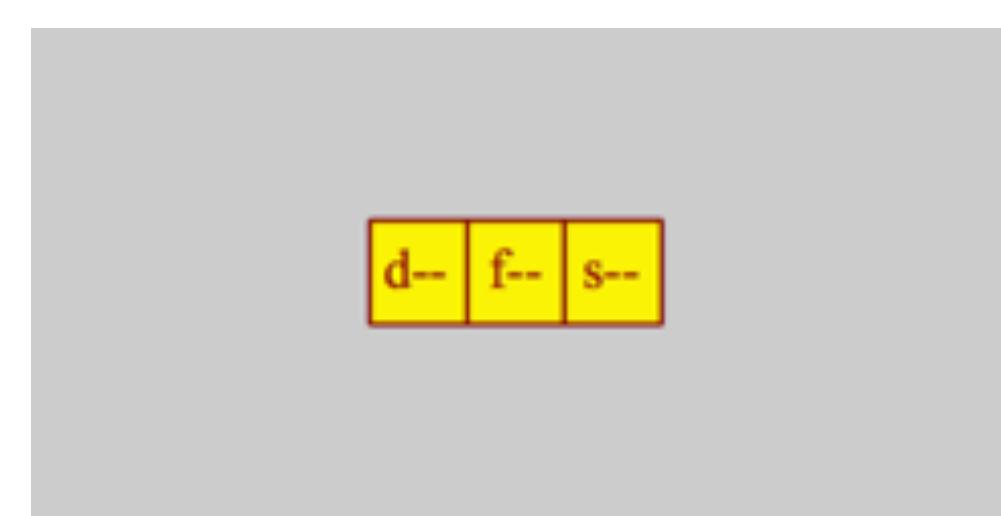
Perception Experiment

- Investigation:** role of stress system (quantity sensitive) in L2 stress perception in Arabic speakers - Comparison with English speakers

Hypotheses

- L2 Arabic speakers will have more problems perceiving the location of stress than English native speakers.
- Arabic speakers' perception of stress will be sensitive to the syllable position and weight.

Participants 10 Ar, 10 Eng



Procedure

- Identification task:** participants listened to 3-syllable words and determine position of stress.
 - Tested words presented in spelling, broken into three squares (3 sylls) on the screen.
 - Only the onset consonants presented.
 - Participants clicked on the square corresponding to the stressed syllable. (Instructions and practice were provided)

Perception Experiment

Stimuli

- 90 English 3-syllable nonce words; open syllables.
- Spelling: close to unambiguous spellings for tense vowels or diphthongs (= heavy syllables); or schwa (light syllables)
- Syllable:
 - Heavy (H) = CVV (tense V): eg. *bee.ge.ma* ; CVG (diphthong): e.g. *be.soy.fye*.
 - Light (L) = CV (schwa V): e.g. *de.nay.sa*

Stress Position	Word Type	Example
1 st syllable	HHL	doo.fee.na
	HLH	bay.ne.dee
	HLL	bee.ge.ma
2 nd syllable	HHL	fey.boy.ka
	LHH	be.soy.fye
	LHL	de.nay.sa
3 rd syllable	LHH	de.fee.day
	HLH	goi.be.say
	LLH	se.ke.doi

- Word types:
 - 1 or 2 H syllables per word.
 - positions of H and Stress varied systematically.

- 3 word types per H position and stress.

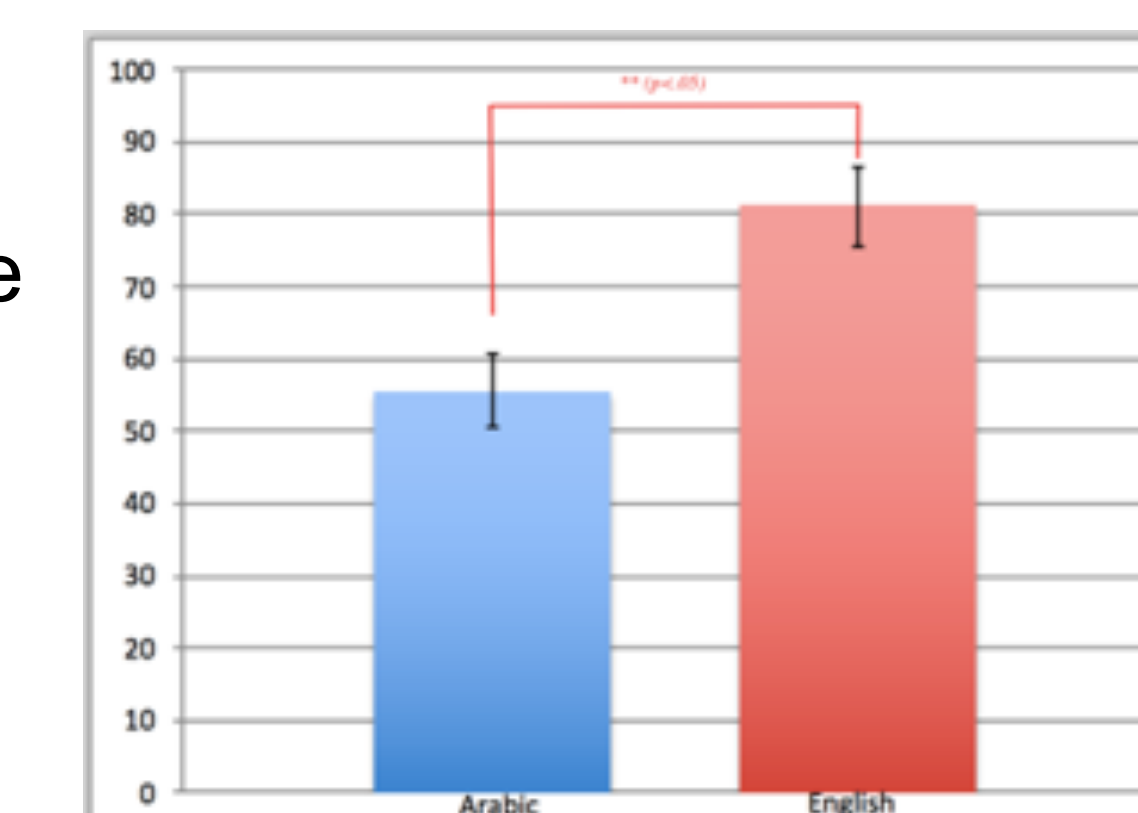
Analysis

- Accuracy of stress recognition by speaker group
 - Role of Stress position
 - Role of Syllable weight

Results

1) Effect of predictability :

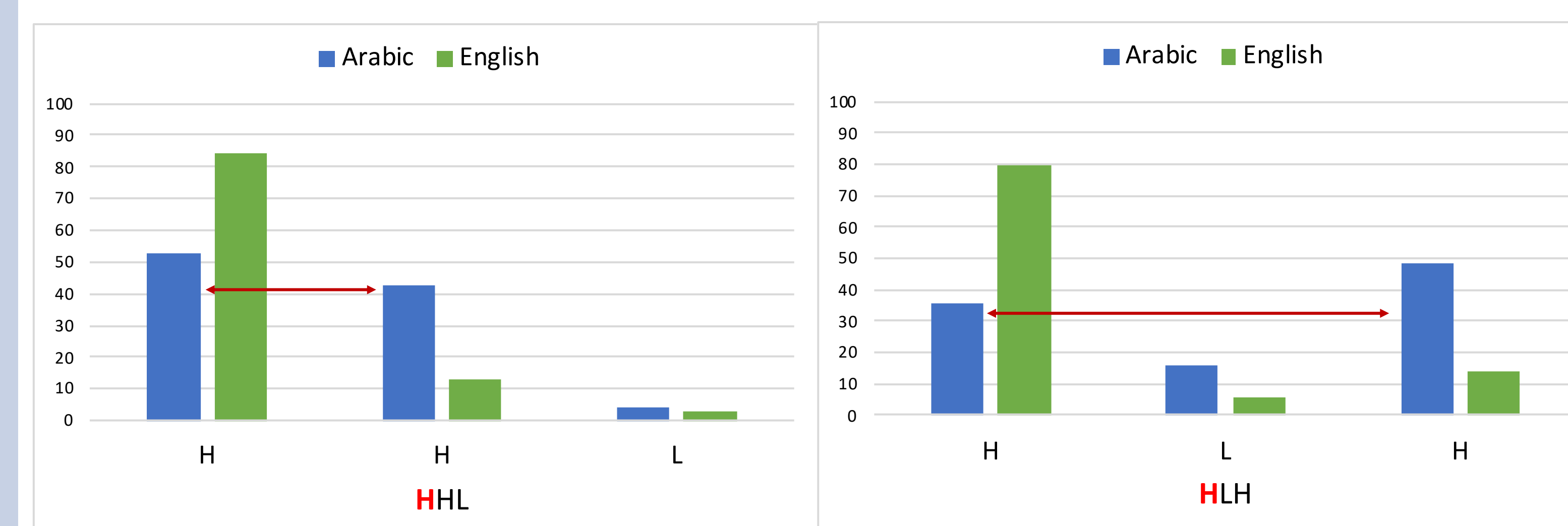
Arabic speakers' perception is significantly worse than English speakers'.



2) Effects of weight and syllable position:

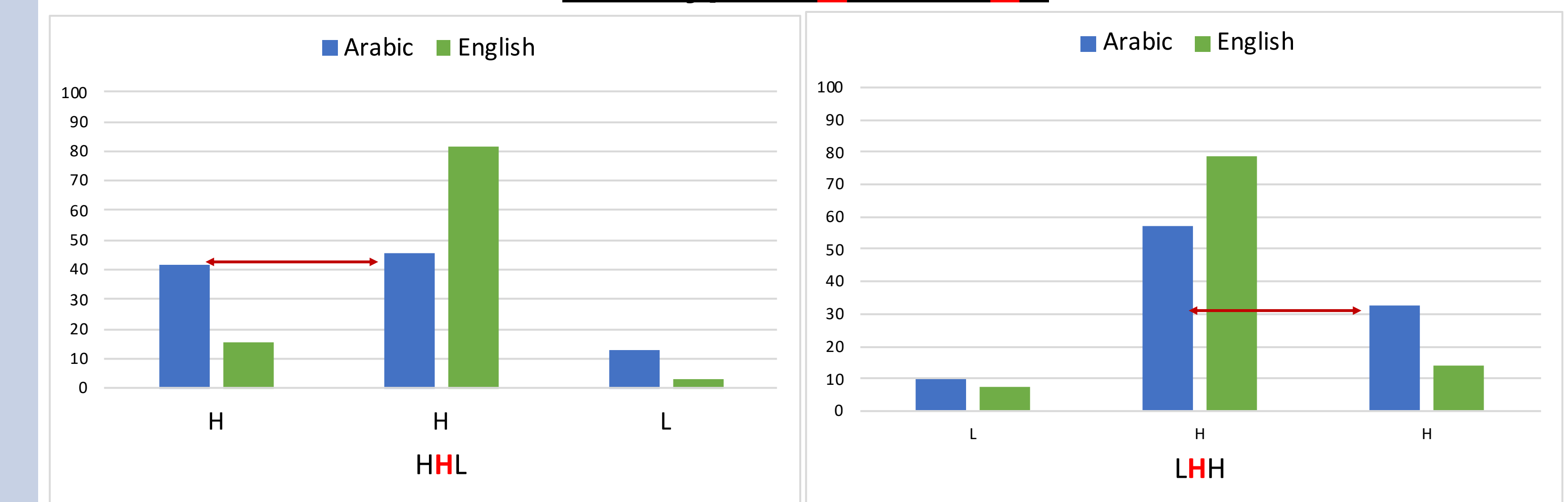
- Syllable Position: not significant
- Syllable weight: Arabic speakers were sensitive to syllable weight:
 - More difficulty in perceiving stress in structures with two H syllables than structures with one H syllable.
 - Tendency to respond to H syllables as stress even if they were not.

Stress on 1st syllable: word types HHL and HLH

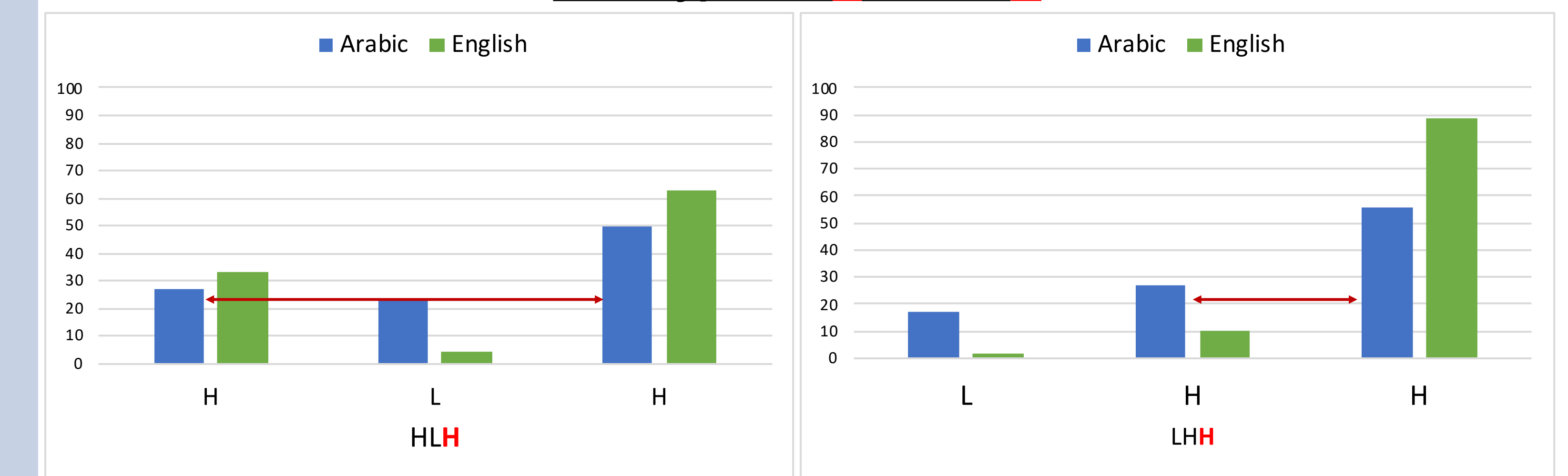


Results

Stress on 2nd syllable: word types HHL and LHH



Stress on 2nd syllable: word types HLH and LHH



Conclusions

- Predictability of stress affects stress perception: Arabic speakers are 'stress deaf'.
- Quantity-sensitivity affects stress perception: syllable weight plays a vital role in the perception of English stress by Arabic speakers.
- In accordance with electrophysiological results on stress perception in Cairene Arabic [3]: prosodic structure determines stress perception in QS languages.

Further Research

- Compare results to other predictable languages that are QI.
- Include analyses of production.

Selected References

- Altmann, H. (2006). The Perception and Production of Second Language Stress: A Cross-linguistic Experimental Study. Ph.D. Dissertation, University of Delaware.
- Altmann, H. & Vogel, I. (2002). L2 acquisition of stress: The role of L1. Paper presented at "Multilingualism Today" in Mannheim, Germany, March 2002.
- Domahs, U., Genc, S., Knaus, J., Wiese, R., and Kabak, B. (2014). The role of predictability and structure in word stress processing: an ERP study on Cairene Arabic and a cross-linguistic comparison. *Front. Psychol.* 5:1151. doi: 10.3389/fpsyg.2014.01151 This article was submitted to *Language Sciences*, a section of the journal *Frontiers in Psychology*.
- Peperkamp, S. & Dupoux, E. (2002). A typological study of stress 'deafness'. In C. Gussenhoven & N. Warner (eds.): *Laboratory Phonology 7*: 203-240. Berlin.