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Faculty of Literature, Department of Linguistics

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PROCEEDINGS BOOK

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Mehr 28-29, 1400 (October 20-21, 2021)

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Welcome to the ICLPP 2021

The 2nd International Conference on Laboratory Phonetics and Phonology was held virtually on 20-21 October 2021 at Alzahra University. The conference was due to take place on-site in Tehran, Iran. However, the COVID-19 pandemic has made it necessary to hold it virtually. The ICLPP2021 provided a forum for experts and young researchers to present their latest work. Also, the conference aimed to raise awareness about the current research trends in laboratory phonetics and phonology, build relationships among Iranian and non-Iranian researchers and experts, identify gaps in knowledge and subjects requiring new information, and celebrate success.

This proceeding highlights the diversity and scope of the many exciting pieces of research presented at the conference. The 15 full papers presented were selected carefully from 45 abstract submissions. All the abstracts were reviewed by the conference scientific committee. Also, the accepted papers were blind-reviewed by at least two reviewers. Topics at this conference included laboratory phonetics, forensic phonetics, clinical phonetics and speech disorders, acoustic phonetics, speech prosody, and emotion analysis. Papers have used a wide range of empirical research methods including experiments, case studies, field studies, clinical studies, and corpus studies.

I would like to thank the prominent phoneticians, Professor Daniel Hirst from the French National Center for Scientific Research, and Dr. Eugenia San Segundo from the National University of Distance Education of Madrid, Spain who kindly accepted our invitation to contribute to the conference as keynote speakers. I would also like to thank members of the scientific committee for their generous support of this conference. I also appreciate the efforts of the executive committee members who worked tirelessly to enable the ICLPP2021 to take place.

Mandana Nourbakhsh
Tehran - December 2021

Keynote Abstracts

Automatic Visual & Auditory Feedback for Second Language (L2) Speech Prosody

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ABSTRACT

It is well known that L2 speakers have particular difficulty with prosody - the rhythm and melody of their speech - and that this is a major factor leading to their speech being difficult to understand for native speakers. This presentation suggests the possibility of providing automatic visual and auditory feedback as an aid to the improvement of L2 prosody. A number of different possibilities are discussed for the automatic analysis and display of rhythm and melody. One of these has been implemented as an automatic procedure in the ProZed plugin for the Praat software. Finally it is shown that the prosody of a native speaker, analysed in this way, can be transfered to a recording of the same utterance by an L2 speaker, allowing them to hear a recording of their own voice but with native-like prosody. It is hoped that this could provide an efficient tool to improve the prosody of L2 speakers.

OUTLINE

- Introduction: the functions of speech prosody
- Prosodic annotation
- Automatic analysis and display of prosody
- Automatic feedback for L2 learners

1. INTRODUCTION: THE FUNCTIONS OF SPEECH PROSODY

Speech prosody has numerous functions in natural discourse including:

- intelligibility *You're leaving tomorrow*
  - statement? question? order?
- speaker states *This lecture is really interesting*
  - emotions, attitudes
- naturalness
  - natural prosody facilitates cognitive processing
  - listeners have more difficulty in processing atypical speech, which is:
    - not healthy (pathological)

- not standard (dialectal)
- not native (L2)
- not human (synthetic)

Learners have difficulty with L2 prosody.

How can we help them improve their prosody, the *rhythm* and *melody* of their speech?

- Provide visual feedback
- Provide auditory feedback

2. PROSODIC ANNOTATION

The explicit characterization of the:

- length *duration*
- pitch *fundamental frequency*
- loudness *intensity*

of the individual speech sounds (*phonemes, syllables, words*…) which make up an utterance.
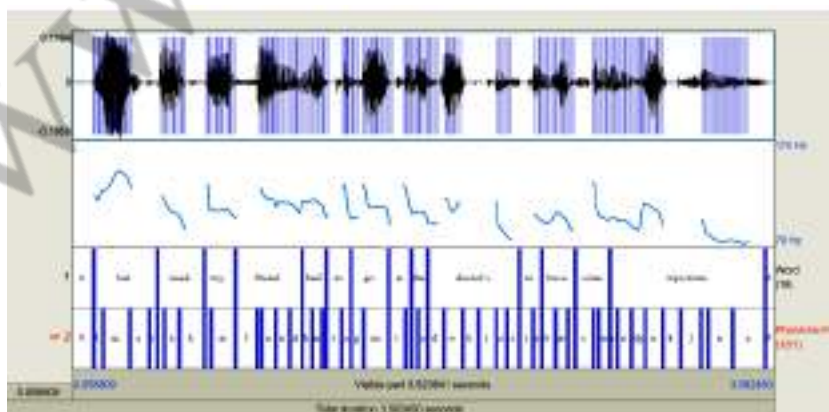
2.1. Prosodic Annotation by Ear

- Klinghardt & Klemm 1920 (1927)
- Jones 1918 (3ʳᵈ edition 1932)
- Wells 2006

2.2. Prosodic Annotation from Acoustic Data

Praat (Boersma & Weenink 1992) TextGrid
Last week my friend had to go to the doctor's to have some injections

Voice Quality at the Crossroads between Forensic Phonetics and Clinical Phonetics

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In this talk, I will focus on a voice parameter that has been widely investigated in Forensic Phonetics, particularly in the past five years. This feature is called "voice quality" and it has two possible interpretations. In a narrow definition, it refers to the activity of the vocal folds only and it implies the acoustic analysis of sustained vowels. According to the broad definition, VQ results from a combination of long-term laryngeal and supralaryngeal features.

I will start by introducing what Forensic Phonetics is and its main areas of application, in order to gain some insight into the most common methods and parameters used in Forensic Speaker Comparison, a task that forensic phoneticians are frequently requested to do. This consists in comparing the recording of an unknown offender with the recording of a suspect in order to find out whether those two voices belong to the same speaker.

This introduction to Forensic Phonetics will allow me to eventually put the emphasis on voice quality as a forensic parameter. It is worth mentioning that the European Network of Forensic Science Institutes (ENFSI) includes voice quality in its recent *Best Practice Manual for the Methodology of Forensic Speaker Comparison*. In this talk, I will mention the existence of simplified versions of the Vocal Profile Analysis scheme for the perceptual assessment of voice quality and I will highlight the importance of such simplifications, as put forward in a recent international survey on voice quality practices by forensic phoneticians and clinicians. By emphasizing the crossroad where Forensic Phonetics and Clinical Phonetics meet, I hope to create more synergies between two fields of Applied Phonetics where current interdisciplinary collaborations are already proving fruitful for both disciplines.

Papers

Mehr 28-29, 1400 (October 20-21, 2021)

Not on the Word, But in the Syntax: the Persian 'Stress'

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ABSTRACT

This paper argues for a revision of standard assumptions about the prosodic structure of words and phrases of Persian. These earlier assumptions concern two aspects. First, Persian has a lexical stress system where (prefixed) verbs are stressed on the first syllable and other words on the last. Second, Persian has phonological rules that assign prominence to the head of a phonological word and to the head of a phonological phrase. The revision of both assumptions is summarized as follows. First, Persian has no lexical stress. The 'stress' of previous descriptions is a tone, /H/. Second, the phonological structure (e.g. phonological word/phrase) is never used for distribution of /H/. All generalizations about the location of the tone refer to the morphological and syntactic structure. Third, while Persian lacks lexical stress, words do have foot structure. The main role of the foot is to determine the occurrence of consonants and vowels.

Keywords: *Persian, Word Prosody, Sress, Accent.*

1. INTRODUCTION

There are many valuable works on stress and intonation in Persian that are empirically rigorous and theoretically well-informed. While these studies have made important contributions to our understanding of the prosodic structure of Persian, the aim of this article is to challenge two basic, interrelated assumptions in standard approaches to stress and intonation in the language. The first relates to the nature of the phenomenon that has invariably been described as 'word stress' in Persian. Since its early description by European scholars in the 19th century, we have rarely questioned whether it is really what the term 'word stress' suggests. Is the general assumption tenable that the Persian 'stress' reflects some sort of metrical prominence as part of the lexical representation of words? Beyond the superficial similarity between the Persian 'stress' and word stress in familiar European languages, it is possible that the function and grammar of the two differ substantially.

The second issue, which is not confined to Persian, concerns the common assumption in mainstream intonation research that the presence or absence of pitch accents depends on phonological rules. It is not always clear why and how metrical or prosodic structures are required to explain the distribution of pitch accents in the world's languages. As recently discussed in Gussenhoven (2021), our bias towards phonology has led us to greatly underestimate the role of morphosyntactic rules in determining the distribution of pitch accents. The current paper will highlight the fact that the generalizations governing the accent locations in Persian refer to the morphosyntax rather than to the phonology. Prosodic hierarchy or metrical structure plays no obvious role in the assignment of accents. Pitch accents target the edge of morphosyntactic constituents. They resemble segmentally-encoded bound morphemes (e.g., morphological affixes, clitics, and particles), which attach to other constituents for various morphosyntactic and discourse purposes.

There are generally two existing approaches to word stress in Persian: 1) morphological 2) prosodic. The first approach, based on Ferguson (1957), is described in section 2.1, while section 2.2 provides an overview and critical discussion of the second approach. The syntactic nature of the accent is dealt with in section 2.3. Foot structure is discussed in section 3, while section 4 concludes the paper.

2. DIFFERENT APPROACHES TO STRESS

2.1. Morphological Approach

Ferguson's conception of stress in Persian can be summarized as follows: "A Persian word pronounced in isolation has one syllable of heavier stress than others. When the word is used in a sentence, usually the same syllable is stressed or the word has no stressed syllable at all… The syllable on which the stress falls when a given word is uttered in isolation is said to have 'inherent' or 'potential' stress, or simply the WORD STRESS."

He further explained that there is one and only one stress per MORPHOLOGICAL WORD or simply WORD, which domain, as understood in Western scholarship on Persian, consists of a stem, whether simple, derived or compound plus inflectional affixes/clitics. Uninflected WORDS have final stress but nonfinal stress can be widely found in inflected WORDS because verb inflectional prefixes pull the stress over to the initial syllable whereas inflectional suffixes/clitics leave the stress of the base intact. Stress carries an extremely high functional load in distinguishing otherwise ambiguous WORD pairs, mainly due to homophony between inflectional affixes/clitics and derivational affixes (e.g. /xub-i/ [xú.bi] 'you are good' vs /xub-i/ [xu.bí] 'goodness'; /na-sɒz/ [ná.sɒz] 'do not make!' vs /na-sɒz/ [na.sɒ́z]' 'discordant').

It emerges from Ferguson's observations that STRESS in Persian is essentially a morphological concept, in that it is systematically used for morphological marking, with prosodic or metrical factors playing no role. From recent studies, we now know that the syllabic prominence at issue is phonologically a H tone or accent, which is in line with its morphological (non-metrical) function. The Persian accent is prone to deletion, depending on the sentential contexts in which words occur, to the extent that members of minimal pairs become homophonous (Rahmani, 2019). Note that in a language like English stressed syllables are never affected by postlexical rules.

2.2. Prosodic Approach

Most recent researchers, who are inspired by Prosodic Phonology, have assumed that STRESS assignment in Persian is governed by prosodic phrasing. In Kahnemuyipour (2003), for instance, STRESS marking is formulated with reference to prosodic domains, which are transparently derived from morphosyntactic constituents. Morphosyntactic words (X^0) and phrases (XP) map onto phonological words (ω) and phonological phrases (φ), respectively. ωs are stressed on the final syllable (ω-rule), while φs are stressed on the first ω (φ-rule). In this account, polymorphemic constructions (corresponding to Ferguson's WORDS) are often analyzed as φ, assuming that inflectional affixes/clitics are independent X^0s that map onto their own ω domains. (1) illustrates how this system works for an inflected verb (1a) and a cliticized adjective (1b).

(1) a. $x_φ$
$(x_ω \; x_ω \; x_ω)_φ$
$(mí)_ω(raft)_ω(im)_ω$

DUR-go.PST-1PL 'we would go'

b. $x_φ$
$(x_ω \; x_ω)_φ$
$(bolánd)_ω (i)_ω$

tall=COP.PRS.2SG 'you are tall'

Prosodic approaches suffer from a number of important shortcomings. They generally assume, whether explicitly or implicitly, that what they refer to as STRESS is a prosodic or metrical entity. In these analyses, STRESS is widely taken as a defining feature of prosodic domains like phonological word, phonological phrase, accentual phrase, etc. That is, STRESS assignment is regarded as edge-marking or head-marking of these prosodic domains, as seen in Kahnemuyipour's account. This conception of stress is apparently influenced by the prosodic structure of the familiar European languages. Word stress in a language like English or Dutch is a metrical phenomenon, in that stressed syllables are heads of a prosodic constituent, the foot. Evidently, foot formation is the phonologization of an articulatory tendency for rhythmic grouping of syllables (foot formation in Persian will be discussed in section 3). A hallmark

of metrical stress is thus alternation, the tendency for stressed and unstressed syllables to alternate.

However, there is no clear indication that the Persian STRESS is metrical. In fact, evidence points to the contrary. Generalizations governing STRESS location can be straightforwardly formulated in terms of morphological factors, e.g., category labels like Noun and Verb, morphological processes like compounding and inflection, etc. (as well as syntactic processes as will be seen in section 2.3). There is no alternating pattern of stressed and unstressed syllables, not even in long words, nor is there any metrical tendency for STRESS to occur near the beginning or the end of words, independently of morphological determinants. This crucial difference between English stress and Persian stress was made clear in Ferguson's account, who described Persian stress as morphological stress, as noted in section 2.1.

Just as we would not normally expect morphosyntactic items like affixes and clitics to follow prosodic patterns in their distribution, we should not expect STRESS to be prosodically distributed. By way of illustration, Kahnemuyipour's account, in which ω is defined solely in terms of STRESS location, predicts that prosodically bound morphemes, as in (1), and lengthy words, as in phrasal compounds (e.g. [pust-e-anbe-kán] 'mango-peeler', 'skin-EZ-mango-peel') map onto the same prosodic rank, i.e., ω. This results in prosodically incoherent and contradictory structures. Such an approach ignores syllabification as the most obvious cue to prosodic wordhood in Persian. A more satisfactory formulation is to define ω as the domain of (obligatory) syllabification. As a rough generalization, ω corresponds to a simple stem plus its bound morphemes. Thus, (1b) would be (bo.lán.di)$_ω$, while the compound [hajaʤɒn-angíz] ('exciting', 'excitement-stimulate') would be [(ha.ja.dʒɒn)$_ω$(an.gíz)$_ω$]. In any event, STRESS location remains unaffected by ω-formation or syllabification.

2.3. Syntactic Nature of STRESS

The non-prosodic nature of STRESS becomes even clearer in its sensitivity to the sentence-level syntactic factors. Various types of nominalization and adjectivization exist whereby a verb phrase or a full clause (or in some cases any string of sounds) functions as a single noun/adjective. Such rank-shifted expressions, irrespective of their internal complexity, are indistinguishable from non-rank-shifted nouns/adjectives in terms of their STRESS pattern, i.e., they are accented on their final syllable.

Rank-shifted structures are abundant and include participles, adverbial and relative clauses, naming expressions and citations. As an example of a naming expression, the accent in the bracketed part of (2a) indicates it is the object of the verb. Its single accent should be compared with the accent distribution in

(2b), where the same segmental form functions as a full sentence. Since nominalizations frequently lack any overt nominalizing morphology, in many contexts nominalized expressions are only distinguished from corresponding clausal expressions by the distribution of accent (for a detailed discussion, see Rahmani 2019). Contrary to the established idea that Persian STRESS is a lexical-morphological entity, these observations suggest that the basic domain of STRESS assignment is post-lexical (syntactic).

(2)   a.   [man bɒ jek komonist   ezdevɒʤ kard-ám]=o   did-í?
           I   with INDcommunist   marriage do.PST-1SG=OM   See.PST.PP-2SG
           'Have you watched *I married a communist*?'

      b.   mán bɒ jék komoníst   ezdevɒ́ʤ kard-am.
           'I married a communist.'

There is psycholinguistic evidence to support the post-lexical nature of STRESS. Rahmani et al. (2015) performed a Sequence Recall Task, in which participants listened to sequences of nonwords that either had a prominence on the first or on the last syllable. The task for the listener was to reproduce the order in which the prominence patterns occurred in the sequence. Persian listeners, like Indonesian and French listeners, performed poorly on this task, while Dutch and Japanese participants did significantly better. Note that Dutch and Japanese unambiguously include prosodic information in their lexicon, while Indonesian and French do not. If this short-term recall task depends on the listener's ability to store word stress in their lexicon, the absence of lexical prosodic annotations in Persian exactly predicts that result, in spite of the fact the functional load of accent locations in words is high.

3. FOOT STRUCTURE

A crucial key in understanding the prosodic nature of Persian sentences comes with an understanding of the metrical nature of its words. In general, word stress is expressed by feet, as noted earlier. For any language with stress, there are either iambic syllable groups (weak-strong) or trochaic ones (strong-weak). Germanic languages are trochaic, as in the English example *Ápa-láchi-cóla*. However, the reverse is not true: a language can have feet, but no stress. Persian is such a language: it is iambic with no (culminative) stress. The main role of the Persian foot is to determine the occurrence of consonants and vowels. The 'weak' vowels [e o a] appear in weak syllables and the 'strong' ones [i u ɒ] in strong syllables, and closed syllables are always strong (cf. Tabibzadeh 2010). Therefore, [na.sim] (weak-strong) 'breeze' could not be *[nɒ.sim] (weak-strong).