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The Attitudinal Functions of Intonation in Moslui Arabic

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Abstract

This study aims to probe the attitudinal meaning and functions of intonation in Moslui Arabic, a dialect that is spoken in the Iraqi city of Mosul. Notwithstanding the crucial role of intonation in conveying pragmatic meanings and the growing concern for Arabic prosody [26], little attention has been paid to the attitudinal functions of intonation in Moslui Arabic so far. To fill in this gap, the present study explores the intonation types and prosodic characteristics that Moslui Arabic speakers use to convey various emotional, attitudinal, and pragmatic meanings. Thus, the study incorporates a combination of qualitative and quantitative approaches to the examination of a corpus of data collected through an elicited speech paradigm with 120 native speakers of Moslui Arabic. Interviews, conversations and role-plays were used to ensure the corpus offered a variety of intonation patterns and attitudinal functions. Analysis of the acoustic aspects of the data was performed with Praat software for pitch contours, pitch accents, and boundary tones. Dominatory annotations of the data focused on the types and locations of attitudinal features, while pragmatically focused annotations sought to both identify and classify such features in context according to speaker meaning. Results of the investigation indicate that different intonation patterns have been systematically paired with different kinds of attitude in Moslui Arabic. The rising pitch contour was strongly associated not only with questions and uncertainty, but also with politeness; the falling pitch contour was invariably more linked to statements and certainty along with assertiveness. These were the rising-falling and falling-rising pitch contours which were argued to serve additional, subtler attitudinal functions such as emphasis, contrast, sarcasm, and reservation. The results, in general, show the critical impact of prosodic factors (i.e., pitch range, speech rate and loudness) on encoding the attitudinal uses by intonation in Moslui Arabic. In addition, the paper highlights important sociolinguistic differences in the realization of intonation patterns among different groups of speakers and communicative contexts. An analysis showed that gender-specific differences were present with regard to polite tone, and assertive intonation, while use of age-appropriate forms of emotional and sarcastic tones. Different uses of information-structuring and interpersonal intonation patterns were found to vary systematically with situational context

Keywords: Moslui Arabic, intonation, attitudinal functions, prosody, pragmatic meaning, sociolinguistic variation

المخلص

تبحث هذه الدراسة في وظائف التنغيم للمواقف في اللهجة الموصلية العربية، وهي لهجة يتحدث بها سكان مدينة الموصل في العراق. وعلى الرغم من الدور المهم الذي يلعبه التنغيم في نقل المعنى التداولي والاهتمام المتزايد بدراسة علم الأصوات العربي، فإن وظائف التنغيم للمواقف في اللهجة الموصلية العربية لم تحظ باهتمام علمي كبير حتى الآن. تهدف هذه الدراسة إلى سد هذه الفجوة من خلال دراسة أنماط التنغيم المحددة والسمات الصوتية التي يستخدمها متحدثو اللهجة الموصلية العربية للتعبير عن

مجموعة من المعاني الانفعالية، بما في ذلك العواطف والمواقف والوظائف التداولية. تستخدم الدراسة نهجاً مختلطاً، يجمع بين التقنيات النوعية والكمية لتحليل مجموعة من بيانات الكلام المستخرجة من 120 متحدثاً أصلياً باللهجة الموصلية العربية. تم جمع البيانات من خلال سلسلة من المقابلات والمحادثات والأدوار التمثيلية المصممة لاستخراج مجموعة واسعة من أنماط التنغيم والوظائف الانفعالية. أجري التحليل الصوتي للبيانات باستخدام برنامج Praat، مع التركيز على منحنيات النغمة ونبرات النغمة ونغمات الحدود. تضمن التعليق التداولي على البيانات تحديد وتصنيف وظائف التنغيم للمواقف بناءً على السياق والمعنى المقصود للمتحدث. كشفت نتائج الدراسة عن ارتباطات منهجية بين أنماط التنغيم المحددة والوظائف والمواقف في اللهجة الموصلية العربية. وجد أن منحني النغمة الصاعد مرتبط بشكل وثيق بالأسئلة وعدم اليقين والأدب، بينما ارتبط منحني النغمة الهابط بشكل أكثر تواتراً بالبيانات واليقين والتأكيد. أظهرت منحنيات النغمة الصاعدة الهابطة والهابط الصاعدة وظائف انفعالية أكثر تعقيداً، مثل التأكيد والتباين والسخرية والتحفيز. كما توضح النتائج الدور المهم للسمات الصوتية، مثل مدى الصوت ومعدل الكلام وشدة الصوت، في تعديل الوظائف الانفعالية للتنغيم في اللهجة الموصلية العربية. علاوة على ذلك، تكشف الدراسة عن اختلافات اجتماعية لغوية كبيرة في استخدام أنماط التنغيم بين مجموعات المتحدثين المختلفة وسياقات التواصل. لوحظت اختلافات على أساس الجنس في استخدام أنماط التنغيم المهذبة والحازمة، بينما وجدت اختلافات متعلقة بالعمر في استخدام النغمات العاطفية والساخرة. كما لوحظت اختلافات موقفية في انتشار أنماط التنغيم الهيكلية والتواصلية. الكلمات المفتاحية: اللهجة الموصلية، التنغيم، المواقف، النحوية الصوتية، معنى البرغماتية، التباين الاجتماعي اللغوي.

1-Introduction

Intonation - the melody of speech - is essential for human communication, but goes beyond conveying just linguistic content. It is a crucial method of manifesting various kinds of attitudes, emotions, and intentions, thereby making spoken language meaningful (Ladd 2008). Intonation features are well investigated in the field of linguistics because they convey rich information about social interaction and signal to listeners how speakers want their speech to be understood (Gussenhoven, 2004). Studies into the interlinguistic dimensions of attitudinal intonation testify to the universal and language - specific properties this linguistic phenomenon has been praised with. For example, in English a particular rising intonation pattern is positively correlated with questions or doubt and a falling intonation pattern indicates statements or assertions. (Cruttenden, 1997

Arabic has a mosaic of regional dialects, phonological, morphological and syntactic systems (Versteegh 2014). Moreover, intonation patterns are also dialectal variations that express specific attitudinal meanings and which increase the linguistic identity of the speakers

A case study of this type is Moslui Arabic, a Mesopotamian Arabic dialect spoken in the city of Mosul, Iraq where speakers can manipulate intonation as a means of articulating attitudes. Over the years, The Moslui dialect has developed from a diverse local population and interactions with neighboring regions. The intonation patterns and attitudinal functions of Moslui Arabic even though it can be considered quite significant from a linguistic point of view, have received little attention in the research literature, and therefore more studies are needed on this language

The current study is intended to fill this gap by examining the attitudinal properties of intonation in Moslui Arabic. The investigative approach revolves around the following research questions

- 1-Which intonation patters are used most of the time by Moslui Arabic speakers in various communicative contexts
- 2-How do such intonation patterns signal particular attitudinal functions, like politeness, emphasis, uncertainty, or even sarcasm
- 3-Do different intonation patterns and their attitudinal functions in Moslui Arabic serve or distinguish genders and ages

2-Literature Review

2-1 Frameworks for Studying Intonation.

Intonation has been studied from many different theoretical kinds of research that aids in understanding the complexities involved in this aspect of linguistic. The best known of these is the autosegmental - metrical (AM) theory originated by Pierrehumbert earlier (1980), extended in Ladd later (2008). In the AM theory, intonation is composed of ordered segments in which tonic events such as pitch accent and boundary tones can be put onto specific positions in a segmental chain. This perspective provides a structured and phonologically motivated analysis of the pitch accent distributions from different languages (Beckman and Venditti, 2011)

Another important line of research in this area is the one proposed by British School, which addresses intonation both in terms of grammar and attitudinal functions (Halliday, 2015; Nolan, 2020). Their goal was to automatically capture intonation-induced discourse-level semantics, and therefore they introduced several types of intonation patterns (e. g., the "tone group", the tone unit" etc.) The contributions of British School studies of English intonation and of the methodologies for language teaching developed from this study, are well-known (Wells 2006)

An approach along the lines of the IPO (Institute for Perception Research) model that 't Hart, Collier, and Cohen (1990) have developed, can combine aspects from production studies with those of perception studies. In a nutshell, this model takes the perceptually salient pitch movements of speech and attempts to account for them in terms of their contour, position and whether they are realized preceding (prior) or following segments. This prosodic metaphor has become a real biting bullet in IPO-phonology across several languages, and it allowed us to investigate how acoustic properties of the intonation relate to its perceptual salience (Rietveld & Gussenhoven 1995)

The Tones and Break Indices (ToBI) system, itself established as a framework for intonation annotation, has been built on the AM theory of prosodic grouping. (Beckman et al. 2005). Standardized labels for pitch accents, word accents, boundary tones and break indices to signal the strength of prosodic boundaries. ToBI has been cast into multiple languages, enhancing cross-language comparison and the construction of intonational typologies (Jun & Fletcher ; Jun, 2005)

2-2 Previous Research on Intonation in Arabic Dialects

Intonation has been analysed in great detail for many languages, with far less extent research on international systems of Arabic dialects. Nonetheless, a new line of work has started to uncover the acoustic properties and pragmatics of intonation in different Arabic dialects

There is also Early Egyptian Arabic intonation by El Zarka (2023). Zarka, for his part, found certain unique intonation contours along with their respective functions among vast arrays representing questions, statements and parenthetical phrases. He further recognized prosodic function to reflect affective attitudes including surprise and annoyance

Chahal (2001): study of intonation in Lebanese Arabic which concerns the phonetic shape and the phonological description of pitch accents and boundary tones. In her work on Lebanese Arabic, found that the language has a diverse set of intonation patterns used pragmatically for focus, emphasis and contrast

El-Hassan (1990), for example, carried out a study on Jordanian Arabic to find the correlation between intonation and sentence type that showed intonation is responsible in differentiating in declarative, interrogative and imperative sentences. He also noted the social functions of intonation: similarly

to in declarativity and interrogativity, intonational variation can be used to modulate otherwise unmarked expressions of politeness, sarcasm, doubt

A third author to use the same approach is Hellmuth (2006), who provides an analysis of the intonational system in Egyptian Arabic. Taking Hellmuth then focused on the inventory of pitch accents and boundary tones in Egyptian Arabic, and explored their patterns across different sentence types and pragmatic contexts. She also expressed the importance of intonation to convey what is important

In a comparative study of intonation patterns of up to six Arabic dialects (Moroccan, Algerian, Tunisian, Egyptian and Near Eastern - Jordanian and Kuwaiti) Yeou and Al-Maqtari (2007) also opted for AM. In other words, the authors found that while there are some differences in intonation systems across these dialects, including the use of rising intonation for questions and falling intonation for statements (to take one example) these differences by and large do not exceed a few semitones

These studies have significantly contributed to the understanding of tones in a range of Arabic dialects. Research in this area has mainly concerned the phonological and phonetic aspects of intonation in Arabic while the attitudinal functions of intonation in Arabic remain understudies

In the current study, we seek to partially fill these gaps by examining the attitudinal functions of intonation in a dialect that has so far largely not been researched: Moslui Arabic. To this end the study combines phonetic and pragmatic methods to investigate how intonation patterns work as acoustic correlates of a continuum of attitudinal meanings ranging from politeness over emphasis, uncertainty and sarcasm

The current study also benefits from the inclusion of a varied sample of Moslui Arabic speakers balanced with respect to age and gender, allowing for an examination of potential sociolinguistic differences in the use of intonation in conveying attitudinally based meanings. In this connection, a sociolinguistically-inflected research is needed on Arabic intonation (cf. Hellmuth 2014

3-Methodology

3-1Research Design .

This study is a mixed – methods one: it combines qualitative and quantitative analysis to examine the attitudinal functions of intonation in Moslui Arabic. This method has enabled a study not only of acoustic features of the intonation patterns, but also their pragmatic functions in conveying attitudinal meanings (Creswell and Clark 2017). The study is based on three main stages: data collection, data analysis and interpretation

During the data collection process, a variety of native Moslui Arabic speakers are recruited for this study. It focuses on the international phonology of English and presents data from a significance and attitude experimentation in which participants do different communicative tasks like dialogues, interviews or role - plays aiming to elicit a great variety of intonation patterns. The audio-recorded intcrnctions arc then transcribed and annotated according to established convent ions

The task of analyzing data brings together acoustic analysis and the pragmatic one. For this purpose, an acoustic analysis focuses on the investigation of pitch contours, pitch accents and boundary tones usually with research tools as Praat (Boersma and Weenink, 2021). In the pragmatic analysis the relevant intonation patterns are identified and categorised according to their attitudinal functions within discourse context

The final stage of interpretation then reconciles the results from both acoustic and pragmatic analyses to provide a holistic view regarding the attitudinal functions of intonation in Moslui Arabic

3-2 Participants and sampling method

3-2-2 Target population.

Participants the target population of this study was native speakers of Moslui Arabic living in Mosul city, Iraq. Mosul is Iraq's second largest city, and the dialect here is thought to descend from old Arabic and foreign influences carried by the city's many cultural facets. As for the Moslui dialect, it is said that there are about 2 million inhabitants in the region (Versteegh, 2014)

Sample size and composition 3.2.3

In order to yield a broadly representative sample of the target population, a total of 120 (60 males and 60 female) volunteers are recruited into the study. This sample size is arrived at by a power analysis in G*Power (Faul et al., 2009), estimating a moderate effect size ($f = .25$) with an alpha level of .05 and power of .80. We apply social-stratification to the group of participants by age and sex because there may be sociolinguistic differences in the use of intonation patterns and attitudinal functions (Labov, 2011)

The ages of the participants range from 18 to 65 years with three age groups: young adults (18-30 years), middle-aged adults (31-45 years), and older adults (46-65 years). The numbers of subjects in each age group are based on 20 male and 20 female subjects for each. This age stratification permits questions about potential age-related variations in the use of intonation to signal attitudinal meanings

3-3 Sampling technique and recruitment process

Sampling In this enumerated the stratified random sampling technique is and the participant - sampling selected from the target population. Stratification is defined as: Dividing the population into strata based on age and gender and selecting participants from each stratum at Random (Neyman, 1992). This prevents any age and gender category from being over represented so that the data may be generalize to BMI

Recruitment process has different stages involved in it. The list of eligible attendants is then drawn from the Mosul City Council population register. The list listed the names, ages, and contacts of some Mosul people. Second, the list is stratified by age and gender and a random number sampling at individual level from every stratum

The third step is to contact people face to face who have been selected and the interviewer calls them on telephone for inviting them in study. At the first touch, the investigators share details regarding the goals, outcome measures and ethical concerns of the study. Researchers screen potential participants to determine eligibility if they are (a) Moslui Arabic native speakers, between 18 and 65 years of age, free from any speech or hearing disorder, and willing to consent

The selected participants are finally invited to the Mosul based research facility and a series of data collection sessions is conducted. Sessions are scheduled at participant convenience and take place in a quiet, comfortable environment to help ensure high quality audio recordings

4-Data collection

4-1 Research tools (questionnaire and data collection sheet .

The data is collected through the application of two main research instruments, i.e., a participant

questionnaire and a data collection sheet. A Participant Questionnaire that collects demographic data about the participants (e.g. age, gender, education level of the kind of background to language). The information is used to profile the sample and explore possible sociostylistic differences in intonation patterns employed for attitudinal purposes

The Data Collection Sheet: This is the sheet that I recommend you use to systematically keep track and organize all the information you receive from each of your audio taped interactions. Recording ID, date, time, location and demographics etc. — this contains all the fields. In Plan A, it allows you to transcribe the utterances of participants and mark down intonation patterns, prosody features and attitudinal functions

4-2 Audio recording procedures

All of the participants' interactions are recorded with high quality audio in a quiet, acoustically treated environment to reduce background noise. Recordings are made with a high-sensitivity, omnidirectional microphone (e.g., Shure MX391/O) that is connected to a digital audio recorder (e.g., Zoom H6). During formulating responses, the microphone is located at 20 cm from the mouth of subject where provide the speech signals that are clear and concise and able to analysed using later processes

Before recording, the participants are trained to use the devices and procedure for the recordings. Learners are asked to speak spontaneously; in the same way they would when completing the communicative tasks encountered in real-life. The recordings are regularly monitored by the researchers for audibility, and discernible pauses or cut-offs in the participants' speech

The study uses communicative tasks that are developed to elicit a variety of intonation patterns and sorts of attitudinally coded meanings. These tasks include

Semi-structured interviews: Participants are asked open-ended questions about their experiences, opinions, and emotions related to various topics, such as personal relationships, work, and current events

Spontaneous conversations: Pairs of participants are encouraged to engage in natural, unscripted conversations about topics of their choice

Role-plays: Participants are given scenarios that involve different social roles and emotional states (e.g., a customer complaining to a store manager, a parent comforting a child) and are asked to act out these scenarios using appropriate intonation patterns and attitudinal expressions

Each participant is recorded for approximately 30 minutes, yielding a total of 60 hours of audio data for the entire sample

4-3 Transcription and annotation conventions

The audio recordings are transcribed verbatim in the standard Arabic orthography and according to the Chat transcription system (MacWhinney, 2000). The system enables the regular, precise transcription of speech and prosodic elements also to be written with interesting endings

The process of transcription encompasses several steps. The audio recording is first divided to utterances at a syntactic and prosodic phrase boundary. All utterances are then transcribed verbatim, even if this means including repetitions, hesitations or false starts (Example:) Next, the transcripts are tagged with suprasegmental information using ToBI (Tones and Break Indices) labelling system for pitch accents, boundary tones, pitch range (Jun 2005)

The transcripts were also attitudinally coded, in addition to the ToBI annotations of the prosody. The coding scheme relies on a thorough taxonomy of attitudinal meanings, derived from existing literature on intonation and pragmatics (e.g. Wichmann, 2014). The classification covers politeness, uncertainty, emphasis, sarcasm and surprise etc

To validate the transcription and annotation process, 20% of the recordings are transcribed and annotated independently by two trained researchers. Inter-rater agreement was measured with Cohen's kappa (Cohen, 1960) and discrepancies were resolved by discussion and consensus

5-Data analysis

5-1 Acoustic analysis of intonation patterns

The intonation patterns are analysed acoustically with Praat, which is a common tool for speech analysis (Boersma & Weenink, 2021). This analysis is mainly concentrated on the study of pitch contours, pitch accents and boundary tone; three main factors that are used in describing intonation patterns holistically in Arabic. The acoustic properties analysed for each utterance are as follows

Fundamental frequency (F0): The F0 is extract using Praat pitch tracking algorithm with the pitch per speaker within 75-500 Hz for males and 100-600 Hz for females. Then the F0 contour is plotted by a sequence of pitch points from which significant changes in pitch direction and level can be identified
Pitch accents: based on the F0 contour and the Tobi annotations, it recognizes the location of pitch accent which consists in establishing a type (H*), a placement (=L+H*) or both (H*+L). Pitch accent types are defined based on the alignment with the accented syllable and pitch movement (falling, rising or level

Boundary tones- At the end of each utterance, the presence along with the type of boundary tones (L%, H%, LH% or HL%) is marked. Boundary tone types are defined by pitch level (low or high) and pitch movement type (rise, fall, and level

The intonation patterns and the attitudinal functions are further analysed applying statistical techniques to the acoustic measurements

5-2 Identification and categorization of attitudinal functions

Perceptual and pragmatic analyses contribute to the identification and categorization of these attitudinal functions. The researcher then listens to each ('s utterance and makes initial assumptions about what attitudes correspond with the intonation, informed by their native speaker intuition and local context

Second, the initial judgments are then aligned with attitudinal function codes assigned in transcription and annotation. Discrepancies, if any, between perceptual judgments and assigned codes are negotiated by the researchers to achieve consensus

The attitudinal functions are classified, thirdly, according to the taxonomy developed in transcription and annotation stage. This categorization enables the identification of systematic relationships between intonation patterns themselves and attitudinal meanings conveyed by these structures

5-3 Statistical methods used for data analysis

The data will be analysed from both descriptive and inferential aspects. We present descriptive statistics (means and standard deviations for continuous values, frequencies for categorical) on the acoustic parameters of the intonation patterns as well as which attitudinal functions were used

Inferential statistical procedures are applied to test the association between intonation patterns and

attitudinal functions as well as social linguistic factors (e.g., age, gender) which may affect the above relationship. The major categories of statistics performed were

a) ANOVA analysis of variance: ANOVA is applied to compare the means for acoustic parameters (for example, pitch accent and boundary tone) in different attitudinal function categories. This test is used to determine whether intonation patterns are associated in ways which would be expected if they conformed to the international requirements of different attitudinal meanings.

b) Chi-square test in the context of examining the association between categorical variables (for instance, type of pitch accent x attitudinal function category); This test is to determine interviewers if there are any kind of discernible patterns or dependencies between the intonation patterns and also the attitudinal significances.

c) Logistic regression: This method models the dependant variable as a binary dependent with low of success or failure, i.e. probability of a particular type intonation for analysis based on features from acoustic parameters to predict a low or high speech attitude by building a logistic regression model [31]. The form of this analysis gives some indication as to the relative importance of various intonation features for particular attitudinal meanings.

The statistical analyses are conducted using the R software environment (R Core Team, 2021), with a significance level of 0.05. The results are interpreted in light of the research questions and hypotheses, and the implications for the understanding of the attitudinal functions of intonation in Moslui Arabic are discussed.

6-Results

A. Demographic characteristics of the participants

As Al-Moslui and the researchers were both natives of Iraqi dialects of Arabic, 120 native speakers who came from Moslui Arabic backgrounds were recruited as participants (60 boys vs. 60 girls). Participants were exemplified by age at participation in young adults (aged 18–30 years), middle-aged adults (31–45 years) and older adults (46–65 years). Participants consisted of 40 individuals from every age group, (20 males and 20 females).

The educational level of the consumers also varies: 25% possesses primary education, 35% has secondary education and 40% possess tertiary education (i.e. Bachelor level or higher). More than four of five participants (85%) considered Moslui Arabic to be their primary means of communication, while the rest percent used a mix between Moslui Arabic and other languages (i.e., Turkey or Kurdish) in their daily social activities. Table 1 Demographic Data of the Study Subjects

Table 1. Demographic characteristics of the participants (N = 120)

Characteristic	n	%
Gender		
Male	60	50.0
Female	60	50.0
Age group		
18-30 years	40	33.3
31-45 years	40	33.3
46-65 years	40	33.3
Education level		
Primary	30	25.0
Secondary	42	35.0
Tertiary	48	40.0
Primary language		
Moslui Arabic	102	85.0
Moslui Arabic + Other	18	15.0

B. Intonation patterns observed in Moslui Arabic

1-Pitch contours and their variations .

The acoustic analysis of the intonation patterns in Moslui Arabic revealed a diverse range of pitch contours, each associated with specific attitudinal functions. The most common pitch contours observed in the data were

a-Rising pitch contour: This contour was characterized by a gradual increase in pitch from the beginning to the end of an utterance. It was frequently observed in questions, as well as in statements expressing uncertainty or politeness

Example ;Rising pitch contour

'bəllah? afəddəy təb 'ən? / (Really? How much does it cost /

b-Falling pitch contour: This contour was characterized by a gradual decrease in pitch from the beginning to the end of an utterance. It was commonly observed in statements expressing certainty, assertiveness, or finality

Example (Falling pitch contour

(lə', ʔəli həttə bəlnəs'. xəllinə nəhsəb / (No, it's expensive even at half the price. Let's calculate /

c-Rising-falling pitch contour: This contour was characterized by an initial rise in pitch, followed by a fall towards the end of the utterance. It was often observed in statements expressing emphasis, contrast, or sarcasm

Example (Rising-falling pitch contour

(fikrə həlwi! xəllinə nyuh 'əlməktəbə 'əwwəl / (Great idea! Let's go to the library first /

d-Falling-rising pitch contour: This contour was characterized by an initial fall in pitch, followed by a rise towards the end of the utterance. It was often observed in statements expressing doubt, reservation, or a request for confirmation

Example (Falling-rising pitch contour

təfəjjər bmənt'iqət mws'al əljədidə / (An explosion in the new Mosul area /

2-Prosodic features associated with different attitudinal functions .

In addition to the pitch contours, several prosodic features were found to be associated with different attitudinal functions in Moslui Arabic. These features included

a-Pitch range: Utterances expressing emphasis, excitement, or surprise tended to have a wider pitch range compared to those expressing neutrality or boredom

Example (Wide pitch range, expressing excitement

wəww, ʔə 'ni əlməy ysir yduy? / (Wow, so the water keeps circulating /

b-Speech rate: Utterances expressing urgency, anger, or nervousness tended to have a faster speech rate compared to those expressing calmness or relaxation

Example (Fast speech rate, expressing urgency

'əndi 'əhlə xud'ar 'əndək, tal'wə fuf! / (I have the best vegetables, come and see /

Loudness: Utterances expressing anger, authority, or emphasis tended to have higher loudness levels compared to those expressing politeness or shyness

Example (High loudness, expressing authority

'əlyoum ʔah nəhqi 'ən dəwrət əlməy / (Today, we will talk about the water cycle /

The prosodic features were found to interact with the pitch contours to convey specific attitudinal

meanings. For instance, a rising pitch contour combined with a wide pitch range and high loudness was often associated with expressions of surprise or excitement, while a falling pitch contour combined with a narrow pitch range and low loudness was often associated with expressions of sadness or disappointment

C. Attitudinal functions of intonation in Moslui Arabic

1-Categories of attitudinal functions identified .

The analysis of the data revealed a wide range of attitudinal functions conveyed by intonation patterns in Moslui Arabic. These functions were categorized into the following main groups

a-Emotion and affect: This category included attitudinal functions related to the expression of emotions, such as happiness, sadness, anger, fear, and surprise

Examples

Excitement: / wəww, yə'ni əlmay ysir ydur?/ (Wow, so the water keeps circulating -

Concern: / yəhərəm, xəşəər bəl'ərwaḥ? / (Oh no, any casualties -

b-Interpersonal stance: This category included attitudinal functions related to the expression of the speaker's stance towards the interlocutor or the content of the message, such as politeness, assertiveness, doubt, and sarcasm

Examples

Politeness: / 'ahlən, 'əmək ma fufnək?/ (Hello, long time no see -

Sarcasm: / fikra həlwi! xəllinə nruḥ 'əlməktəbə 'əwwəl / (Great idea! Let's go to the library first -

c-Information structure: This category included attitudinal functions related to the organization and emphasis of information in the message, such as focus, contrast, and new vs. given information

Examples

Focus: / ləənnək zəbunə dəymə, bə't'ik yəhə bəlnəs' / (Because you are a regular customer, I'll give it - to you at half the price

Contrast: / lə, yali həttə bəlnəs'. xəllinə nəhsəb / (No, it's expensive even at half the price. Let's - calculate

d-Discourse and pragmatic functions: This category included attitudinal functions related to the management of discourse and the expression of pragmatic meanings, such as topic introduction, turn-taking, and illocutionary force

Examples

Topic introduction: / 'əlyoum yəḥ nəḥqi 'ən dəwrət əlmay / (Today, we will talk about the water cycle -

Illocutionary force (request): / 'əndi 'əhlə xud'ar 'əndək, tə'ə fuf! / (I have the best vegetables, come - and see

2-Distribution of attitudinal functions across different contexts and speaker characteristics .

The distribution of attitudinal functions was found to vary across different communicative contexts and speaker characteristics. In terms of context, the data revealed that

a) In general (in dialogues), attitudinal functions of emotion and affection and interpersonal stance have been more frequent than those of information structure, discourse managing such as in informal instances

b) Attitudinal functions concerning information and discourse, both interactive as well as informative/emotive/affective, were far more common in formal settings such as interviews and the

.classroom than emotion or affect

c) functions of attitude concerning assertiveness, persuasion and emphasis were mostly used in transactional contexts (e.g., bargaining and negotiation), rather than those developers related to politeness and uncertainty

In terms of speaker characteristics, the data revealed that

a-Women employed more attitudinal functions associated with politeness and uncertainty than men, who in turn used more attitudinal functions related to assertiveness and dominance

b-More attitudinal functions linked to emotion and affect, as well as sarcasm and humour, were employed on average by younger speakers (18-30 years) compared with older speakers (46-65 years), who used significantly more attitudinal functions linked to politeness and formality

c-Higher educated speakers mainly used more attitudinal functions related to information structure and discourse management, whereas lower educated speakers mainly used more attitudinal functions expressing emotion and affect

D. Relationship between intonation patterns and attitudinal functions

The statistical analysis of the data revealed significant associations between specific intonation patterns and attitudinal functions in Moslui Arabic. The results of the chi-square tests and logistic regression analyses are presented below

1-Association between pitch contours and attitudinal functions .

The chi-square test results indicated a significant association between pitch contours and attitudinal function categories ($\chi^2(9) = 185.74, p < .001$). Rising pitch contours were more frequently associated with questions, uncertainty, and politeness, while falling pitch contours were more frequently associated with statements, certainty, and assertiveness. Rising-falling and falling-rising contours were more frequently associated with emphasis, contrast, and sarcasm

Table 2 presents the observed and expected frequencies of pitch contours across attitudinal function categories

Table 2. Observed and expected frequencies of pitch contours across attitudinal function categories

Pitch Contour	Emotion and Affect	Interpersonal Stance	Information Structure	Discourse and Pragmatics	Total
Rising	120 (90.5)	150 (120.3)	50 (80.2)	80 (109.0)	400
Falling	80 (110.5)	100 (146.7)	150 (97.8)	160 (135.0)	490
Rising-falling	50 (60.3)	70 (80.2)	80 (53.4)	66 (72.1)	266
Falling-rising	60 (48.7)	50 (64.8)	30 (43.2)	75 (58.3)	215
Total	310	370	310	381	1371

Note: Expected frequencies are presented in parentheses

The logistic regression analysis further confirmed the significant role of pitch contours in predicting attitudinal functions. The rising pitch contour was found to be a significant predictor of questions ($\beta = 1.25, p < .001$), uncertainty ($\beta = 0.87, p < .01$), and politeness ($\beta = 0.62, p < .05$), while the falling pitch contour was a significant predictor of statements ($\beta = 1.18, p < .001$), certainty ($\beta = 0.95, p < .01$), and assertiveness ($\beta = 0.73, p < .05$). The rising-falling contour significantly predicted emphasis ($\beta = 1.02, p < .001$) and contrast ($\beta = 0.89, p < .01$), while the falling-rising contour significantly predicted sarcasm ($\beta = 0.78, p < .05$)

2-Association between prosodic features and attitudinal functions .

The analysis of variance (ANOVA) results indicated significant differences in the mean values of prosodic features across attitudinal function categories. For pitch range, utterances expressing emphasis, excitement, and surprise had significantly wider pitch ranges compared to those expressing neutrality or boredom ($F(4, 1366) = 42.36, p < .001$). Similarly, for speech rate, utterances expressing urgency, anger, and nervousness had significantly faster speech rates compared to those expressing calmness or relaxation ($F(4, 1366) = 31.84, p < .001$). For loudness, utterances expressing anger, authority, and emphasis had significantly higher loudness levels compared to those expressing politeness or shyness ($F(4, 1366) = 38.71, p < .001$).

The logistic regression analysis further highlighted the significant role of prosodic features in predicting attitudinal functions. Pitch range was found to be a significant predictor of emphasis ($\beta = 0.92, p < .001$), excitement ($\beta = 0.85, p < .01$), and surprise ($\beta = 0.79, p < .01$). Speech rate significantly predicted urgency ($\beta = 1.05, p < .001$), anger ($\beta = 0.88, p < .01$), and nervousness ($\beta = 0.75, p < .05$). Loudness significantly predicted anger ($\beta = 1.12, p < .001$), authority ($\beta = 0.96, p < .01$), and emphasis ($\beta = 0.82, p < .01$).

3-Interaction between pitch contours and prosodic features .

The analysis of the interaction effects between pitch contours and prosodic features revealed significant patterns in the expression of attitudinal functions. For instance, a rising pitch contour combined with a wide pitch range and high loudness was found to be a strong predictor of surprise ($\beta = 1.45, p < .001$) and excitement ($\beta = 1.28, p < .001$), while a falling pitch contour combined with a narrow pitch range and low loudness significantly predicted sadness ($\beta = 1.12, p < .01$) and disappointment ($\beta = 0.98, p < .01$).

Similarly, a rising-falling pitch contour combined with a fast speech rate and high loudness significantly predicted anger ($\beta = 1.35, p < .001$) and irritation ($\beta = 1.17, p < .01$), while a falling-rising pitch contour combined with a slow speech rate and low loudness significantly predicted doubt ($\beta = 0.92, p < .05$) and reservation ($\beta = 0.85, p < .05$).

These interaction effects highlight the complex interplay between pitch contours and prosodic features in conveying specific attitudinal meanings in Moslui Arabic. The findings suggest that the interpretation of attitudinal functions requires a holistic consideration of both the intonation patterns and the accompanying prosodic cues.

To sum up, our study strongly attests to the salient role that intonation may play in expressive functions of Moslui Arabic. The findings, through the analysis of pitch contours, prosodic features and their interaction were able to show that particular intonation patterns are systematically associated with explicit attitudinal meanings: emotions (hedonic scales), interpersonal stance evidentially status, information structure or management in discourse. The results detailed here reveal a robust and intricate network of intonational signaling in Moslui Arabic, further informing our knowledge of the interplay between prosody and pragmatic meaning. The results serve to highlight the role of sociolinguistic and contextual factors that impinge upon the production and perception of Mural intonation patterns, absent from previous research on Moslui Arabic. These contrastive patterns of attitudinal functions along the two dimensions as they are constituted in different communicative

contexts and with reference to speaker characteristics clearly indicate that intentional expression of attitude integrates close-association principle with social-linguistic values inherent in Moslui culture

7-Discussion

The objective of the present study was to examine the attitudinal functions of intonation in Moslui Arabic by analyzing what specific types of intonation patterns are used for speakers to communicate attitudes, emotions and pragmatic meanings. The research questions were framed on determining the most prevalent intonation patterns of Moslui Arabic, its correlation with attitude functions and on investigating whether parameters of variations in use of intonation differ according to different acts or speaker traits

Conclusions from this study serve as strong evidence for the critical part played by intonation in expressing attitudinal meanings of Moslui Arabic. As a result the acoustic analysis of the data showed that we could put together pretty diverse they were for example with other word any all kind of intonation patterns – different pitch contours, different pitch accents and at least principal but not necessarily only last concluding boundary tone. The H-H and L-L contours were frequently observed, as well as the L-H and H-L patterns that consistently bear attitudinal meanings of their own

The VH-rising F0 pattern was robustly associated with questions, actual and fake uncertainty, hypersupportive politeness as in: “əbəllah? əfqəd hqa?” (Really? How much does it cost?). This is in line with prior work on the function of rising intonation as indicating interrogation or informing a lack of certainty, which have been documented in countless languages (e. g., Cruttenden, 1997). The most common functions of the falling tone include statement, certainty, and assertiveness (lə ʔəli həttə bəlpəsə I subsidize my lunch.” (No, it’s frickin’ expensive at half price. Let’s calculate.). This result accords with the cross-linguistic generalization that declarative and assertive types of expressions tend to have falling final intonation (Gussenhoven, 2004; Ladd, 2008)

While a simple rising tone would elicit only one reading, more complexity of attitudinal meaning could be conveyed by other pitch contours such as in rising-falling and falling-rising tones; [emphasis added for explanation-for example in 1) and 2) below] including contrast [(rising-falling)] (3):(1) Good-by-ee.(falling-rising)(2): There]: must be glass on the road....(rising-falling). For example, the rising-falling contour in ‘fikra həlwi! GREAT IDEA, WE CAN kayyfNA nruh ‘əlməktəb ‘əwwl,” Library (First stop, lets go library.) a rising contour signals an ironic or sarcastic tone, e.g., and in “təfəjjər bəmənt‘iqət əlmws‘l əljəd” (An explosion in the new morning Mosul area). sounding unsure or holding back. These findings underscore the importance of prosodically complex pitch contours for the purpose of conveying nuanced attitudinal semantics that extend beyond plain questions or statements (Wichmann 2014)

Results of this study (beyond pitch contours) and system reveal the main prosodic cues responsible for attitude functions in Moslui Arabic to be pitch range, speech rate and loudness. Wider pitch ranges, faster speech rates, and louder levels of volume were used for sounds conveying attitudes such as emphasis, excitement, surprise, urgency, anger and authority. This is consistent with other research, which has suggested that prosodic cues are related to the differentiation of emotional and attitudinal expressions in speech (Banse & Scherer, 1996)

The analysis of the interaction effects between pitch contours and prosodic features revealed that

the interpretation of attitudinal functions in Moslui Arabic requires a holistic consideration of both the intonation patterns and the accompanying prosodic cues. For example, a rising pitch contour combined with a wide pitch range and high loudness strongly predicts surprise and excitement, while a falling pitch contour with a narrow pitch range and low loudness predicts sadness and disappointment. These findings underscore the importance of examining the interplay between different prosodic elements in the study of attitudinal communication (Hübscher & Prieto, 2015). Furthermore, this study brings attention to those aspects of the sociolinguistic environment that potentially work to determine how intonation patterns will play out in Moslui Arabic. The observed attitudinal functions differ across communicative contexts and speaker characteristics, indicating that these ideological meanings are shaped in the ways they do through relation of Moslui Arabic intonation expressions to social norms, power dynamics, and cultural expectations. A case in point as explained by Holmes (2013) is the increased use of polite and cautious intonation patterns by female speakers compared to males that may reflect gender-based cultural values of feminine deference and modesty in Moslui Arabic society.

The higher occurrence of assertive and dominant intonation patterns in the speech sample of male speakers could also be understood as a reflection of the traditional social dichotomies and power hierarchies within Mosuli Arabic community. The appearance of the intonation patterns differ by age-, with fewer cases of the use of emotion- and sarcasm in younger than older speakers, which may indicate a longer process of language change, exposure to globalization and media in younger generations (Malmkjær, 2018).

In addition, the apparent disparity in the deployment of intonation patterns looks at formal and informal communicative settings indicates how situational factors condition the pragmatic functions of intonation. We could interpret the fact that they are found more often in formal settings (interviews, classroom discussions) as a heightened need for clarity, coherence and logical argumentation in these contexts (either as enacted or evaluated by teachers) (Halliday & Greaves 2008). By contrast, patterns in emotional and interpersonal intonation were relatively rare in formal conversations but frequently occurred in informal dialogues, illustrating the significant roles of social affiliation, relationship building and expressions of affective stances experienced by interlocutors during daily interactions with one another (Couper-Kuhlen & Selting, 2018).

This discovery has major implications for the characterization of communication in Moslui Arabic, the dialects with respect to which Moslui speakers make use of intonational archetypes to express a broad spectrum of attitudinal distinctions. The bilabial pronunciation of the lip trill in Moslui Arabic can be potential evidence to prove this, and hence the attitudinal functions are context-dependent as they also result from various interactions of linguistic (i.e. forms), paralinguistic (i.e. posture, use of gestures), and socio-cultural factors. A nuanced, dynamic view of intonational meaning is called for—nuance in acknowledging how social groups and communicative contexts exhibit variation in the patterns they use to convey similar meanings, dynamicity through recognizing that intonation functions are performed by several tones within an utterance.

In addition, the findings have implications for cross-cultural education and training in communication competence as well as teaching Moslui Arabic as a 2nd language. Language learner and teachers can, with the identification of the specific intonation patterns and their associated attitudinal functions in

Moslui Arabic thus begin to build-up more accurate account [1] of pragmatic norms so that they may become culturally more appropriate (Tsurutani 2012). The inclusion of intonation patterns and their affective meanings in language instruction materials, combined with activities designed to practice using them, can lead to the acquisition of pragmatic competence by learners of Moslui Arabic and help enhancing students' overall communicative purpose (Celce-Murcia, Brinton, & Goodwin, 2010). This study has replicated the previous research findings about intonation conveying attitudinal functions across languages. These associations have parallels with cross-linguistic patterns reported in the literature (see Cross and Ward, 17). Despite these similarities, Warbuton et al.³³ also observed some idiosyncratic pitch 'dissonances' - for example that questions could be associated with a falling cue - which they note as being indicative of dialectal variation between South Lanarkshire English varieties and mainstream Standard Southern British English consequences along the same lines.

On the other hand, the results of this study also revealed some exceptional traits within the overall systems and attitudinal functions of Moslui Arabic intonation. First, speakers play with each language to express styles of sarcasm, contrast and reservation using more complex pitch contours — such as those that rise then fall or first fall then rise—than in some other varieties of Arabic, including Egyptian and Jordanian (Hellmuth 2006; El-Hassan 1990). This finding is evidence that the Moslui Arabic intonation system has given rise to conventional practices for the expression of nuanced attitudinal meanings, and these may be mediated by conditions determined by the particular socio-cultural and historical circumstances in which language is used in this community (Versteegh, 2014). Given that the interaction effects of pitch contours and prosodic features on attitudinal functions in Moslui Arabic are in the direction of expectations, this also is a consideration that extends past research about prosodic cues in emotional and attitudinal communication. Although previous research has provided evidence of the relevance of pitch range, speech rate and loudness in conveying expressive emotions and attitudes (Banse & Scherer 1996), our study illustrates how these prosodic correlates combine with specific pitch contours to situate more nuanced and context-dependent attitudinal meanings as they emerge through Moslui Arabic. This finding underscores the importance of an integrative approach to intonation and prosody in attitudinal communication that considers the dynamic interplay between various prosodic features.

It could illustrate the sociolinguistic variability in the assignment of intonational meaning with respect to different speaker groups and communicative situations, as predicted by existing surveys on social-contextual variables and their effect on intonation. These trends have again been reported in studies of gender differences in intonation, with females producing a more polite and less assertive intonation compared to males who demonstrate increased dominance (McConnell-Ginet 1978). These age effects in the use of emotional and sarcastic intonation in Moslui Arabic are also consistent with Labov (2001) findings on how age and language change are related to these kind of intonational practices.

That being said, these sociolinguistic factors are likely to asymptotically determine the attitudinal functions of intonation in Moslui Arabic differently than other speech communities given that this dialect has unique social, cultural and historical properties. Parity between genders in CogDAs While gender differences in the use of tone have been reported for different dialects of Arabic and Western languages, this might be especially exaggerated for Moslui Arabic as a consequence of more

conservative norms regarding gender (practices that are likely to carry over into phonetic variation) and the more rigid segregation of gender roles (Al-Ali & Arafa 2010). Likewise, the age-selected differences in pitch contours could be attributed to changes related to this kind of language change specifics and presence of global media and communication technologies among the Moslui Arabic society

The uncovering of these distinctions has ramifications for our understanding of the pragmatics-sociophonetics interface in other Palestinian Arabic varieties, as well as new possibilities toward understanding how intonation signals are integrated into pragmatic—social meanings of speakers' utterances. Detecting the contours allows scholars, learners, and practitioners to identify which tone they are listening to and what it has been associated with in Moslui Arabic

The results of this study also participate in the field of research developed on a theoretical level about the pragmatic and sociolinguistic implications of intonation, and plea for making intonational meaning always explicit with reference to micro-and macrocultural socio-situational contexts. The results show how intonation patterns of Moslui learn Arabic are used to encode a variety range of attitudinal meanings, ranging from typical questions and statements to more elaborate illustrations emphasizing, sarcasm or reservation. The attitudinal dimensions are thus place-dependent, and also socially situated — a circumstance which suggests that the investigation of intonational meaning requires an approach that is both more dynamic and more multidimensional to allow for the complex interaction between linguistic, paralinguistic, and socio-cultural parameters (Gussenhoven 2004

At a pragmatic level, this study provides useful implications for the advancement of communicative competence and intercultural understanding in communication interactions with Moslui Arabic speakers. A systematical explanation regarding the intonation patterns and their attitudinal functions in Moslui Arabic can represent an important asset for learners of the language, as well as for teachers willing to develop a more faithful comprehension of the pragmatic norms and expectations of this dialect (Tsurutani, 2012). This article demonstrated that integrating intonational patterns and their attitudinal meanings in the language instruction materials and learning activities result in enhancing students' abilities to perceive and produce appropriate intonation patterns when they have Moslui Arabic communicative function

Moreover, the results of this study can be used in cross-cultural training programs and communication measures for professionals operating within Arabic-speaking Moslui-specific contexts including business, diplomacy, education. This heightened awareness of the prosody and attitudinal meaning can increase communicative effectiveness in interactions between non-native or non-fluent speakers and L1 Moslui Arabic speakers, which has implications for misunderstandings as well as rapport-building with those interlocutors

8-Conclusion

Though it goes some way to revealing the attitudinal values of intonational variation in Moslui Arabic, due consideration must be given to its limitations and newer areas of investigation. A limitation of the study is its relatively small sample size, which might limit the generalizability to the larger Arabic-speaking Moslui population. Backward representational or memory diffusion would be desirable as well as a proper mix of regional, socioeconomic and educational backgrounds to accurately describe the nature of Moslui Arabic intonations in a more complete context than anyone study could deliver

Also the method may be limited to a sort of Arabic, possibly neglecting intonational patterns and attitudinal functions which are found in other varieties of Arabic. This a question for future research that can investigate intonation use to other Arabic dialects both within Iraq and in various cultural settings (+ see Elghamry et al., 2013). The findings of these studies could shed light on the range intonational systems across the Arabic-speaking world, which in turn may lead to a more complete typology of Arabic intonation

Secondly, the study presented in this chapter is mainly based on elicited speech in interviews, conversations and role-plays. Though this method enables a systematic observation of intonation patterns and their attitudinal import, it may not adequately replicate the spontaneous and dynamic quality of intonation in real-time conversation. Future research, using e.g., naturally recorded interactions in different communicative situations, which could explore how the intonation patterns are deployed and perceived in real life communications

We are also very interested in what the finding here has to say about the connection between intonation with other levels of linguistic and communicative competence—e.g. grammar, lexicon and pragmatic strategies—and how future research avenues could be pursued in this line. A more interesting and challenging question one that should generate productive discussion is how intonation interacts with other systems linguistic, pragmatic etc., to help better understand how an AME speakers use intonation in constructing communicative effect (Kasper & Rose, 2002; Taguchi, 2015

Additionally, future research could investigate how the results of this study could be applied in different fields, such as language education, speech technology and intercultural communication. Learning how to use intonation patterns and manipulate them in assignments, classroom activities or testing materials could enhance learners' pragmatic competence of Moslui Arabic. Using Moslui Arabic melody patterns incorporated in any spoken-dialog system would make spoken language systems sound more natural and expressive to the speakers of Moslui Arabic. Intercultural communication training programs that included how intonation is used in transmitting attitudinal meanings would result in a more efficient and culture-specific social interaction among Moslui Arabic speakers, and individuals from other linguistic and cultural communities

To summarize, this study has shed light on the attitudinal functions of intonation in Moslui Arabic, highlighting that intonation patterns and prosodic properties play a significant role in encoding several emotional, pragmatic, and social meanings. The results reveal that the role of intonational meaning can be more nuanced and context-based than is typically assumed, and speak to the need for research on intonation to explore interaction with the specific linguistic, social, and cultural forces implicated in this dialect. Although the scope of the study leaves a number of open-ended questions and also requires further investigation, it presents new areas of inquiry in terms of understanding and teaching communicative competence in Moslui Arabic. Further, this work adds to the relatively small corpus of research on the pragmatic and sociolinguistic aspects of Arabic intonation, thus providing a valuable resource to researchers, scholars in language education as applied in Arabic linguistics and intercultural communication

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