Pitch Accent Distribution and Focus Structure in Taifi Arabic: A Production Study

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Abstract

Prosodic encoding of focus in Taifi Arabic is not yet fully understood. A recent production study found significant acoustic differences between syntactically identical sentences with information focus, contrastive focus and without focus. This paper presents results from a production experiment investigating whether information and contrastive focus have prosodic effects on the pitch-accent distributions. Using question-answer paradigms, 16 native speakers of Taifi Arabic were asked to read three target sentences in different focus conditions. Results reveal that every content word is pitch-accented in utterances with and without focus. However, there are very few cases (23.12%) in which the post-focus words are deaccented. The largest percentage of deaccentuation was observed in the utterances with initial contrastive focus. The results show that focus structures in Taifi Arabic show both deaccentuation and post-focus compression. Therefore, the prosodic realization of focus in Taifi Arabic is different from their counterparts in other Arabic dialects such as Egyptian and Lebanese Arabic. These findings have an important implication for both the prosodic typology and focus typology.

Keywords: accent distribution, deaccentuation, focus, post-focus compression, Taifi Arabic

1. Introduction

Information and contrastive focuses are two concepts of information structure (IS); that is, concepts relating to new and contrast information (Halliday, 1967; Chafe, 1976). Focus is divided based on two levels. On one level, it is divided into sentence sentence-focus structure and argument-focus structure (Lambrecht, 1994) (Note 1). In a sentence-focus structure, all information in the utterance is new to the discourse, and hence the utterance is considered to be under neutral focus (1a) (cf. Ladd, 2008). This neutral-focus utterance exhibits the default intonational pattern to which other marked intonational patterns (such as the intonational contour of an argument-focus structure) are compared (Bruce, 1982; Eady et al., 1986; Xu, 1999; Xu & Xu, 2005; Gussenhoven, 2007; Alzaidi et al., 2019). In an argument-focus structure, there is only one item in the structure that carries new (or new and contrastive/corrective) information in terms of the discourse, as exemplified in (1a, and 1b) below. On another level, focus is divided into information focus and contrastive focus (Halliday, 1967; Chafe, 1970; Kiss, 1998). That is, if one item in the utterance carries new information to the discourse, the element is under narrow information focus as illustrated in (1b) in which Peter is narrow information-focused. If one element carries new information and stands in a contrastive/corrective relationship with another element provoked in the discourse, the element is under narrow contrastive focus as in (1c) (i.e., Peter carries new information and stands in a contrastive/corrective relation to another element Sarah in the context). The item(s) under focus are between square brackets [ ], the subscript BF, NF and CF stand for neutral focus, information focus and contrastive/corrective focus respectively.

1) a. What happened? [Mary visited Peter]BF.       Neutral focus
   b. Whom did Mary visit? Mary visited [Peter]NF.       Narrow-information focus
   c. Whom did Mary visit? Sarah? Mary visite [Peter]CF.       Narrow-contrastive/corrective focus

The prosodic encoding of focus is different cross-linguistically and cross-dialectally (Ladd, 2008; Xu et al., 2012; Chahal & Hellmuth, 2014; Jun, 2014). A range of prosodic cues to focus has been identified, such as the presence and type of pitch accent, the peak F0 alignment, pitch range (excursion size), choice of boundary tone,
deaccenting (defined as the lack of pitch accent) and post-focus compression (defined as pitch-acecend compression in F0 and intensity) (Ladd, 2008; Xu, 2011; Féry, 2013; Jun, 2014).

To date, there are few studies investigating the prosodic realisation of focus in Arabic dialects. For example, Chahal (2001) investigates the prosodic realisation of information focus in Lebanese Arabic in accent distribution, F0, intensity, duration and F1/F2. Hellmuth (2006b) investigates the prosodic realisation of information focus and contrastive focus in Egyptian Arabic. Her analyses included accent distribution, pitch range and peak alignment. Alzaidi et al. (2019) investigate the acoustic cues to information and contrastive focus in Hijazi Arabic (Taifi Arabic) including the acoustic analyses of excursion size, maximum F0, mean F0, mean intensity and duration in on-focus, pre-focus and post-focus words. All of these studies show that focus in these Arabic dialects has prosodic effects in production.

In the current study, we collected a set of data that contains morpho-syntactically identical utterance expressing information-focus, contrastive/corrective-focus and neutral/sentence-focus structure. This makes it possible to confirm experimentally the variability of tunes in Taifi Arabic (TA), and determine the presence or absence of pitch accents on every content word in the utterance with and without focus with the purpose of finding the role of tunes. Therefore, we examine the full scale of focus structure in the language under investigation in pre-focus region (i.e., words occurring before the focused word), on-focus region (i.e., the word under focus) and post-focus region (i.e., words occurring after the focused word).

2. Background

2.1 Prosodic Focus

Focus has local prosodic effects, including the phonetic enhancement of the on-focus word, the deaccentuation of post-focus words, post-focus compression, whereas pre-focus words are largely intact (Ladd, 2008; Xu, 2011; Gussenhoven, 2004). The prosodic encoding is not universal, even within a single language (Gussenhoven, 2002; Swerts et al., 2002; Avesani & Vayra, 2005; Ladd, 2008; Chahal & Hellmuth, 2014). Due to space limit, our background section includes only those few studies on the effects of focus on accent distribution for being relevant to the scope of the current study.

Recent studies show a clear effect of focus on accent distribution. However, the effects are not similar cross-linguistically. For example, the connection between accent distribution and information status in Germanic languages such as English is stronger than that in Romance languages such as Italian and Romanian (Cruttenden, 1993; Ladd, 2008; Swerts et al., 2002; Avesani & Vayra, 2005). In Germanic languages, words following focus are deaccented (Ladd, 2008), whereas in Romance languages, they are not (Cruttenden, 1993; Ladd, 2008; Gussenhoven, 2004; Swerts et al., 2002; Avesani & Vayra, 2005).

Another prosodic cue to focus is a default pitch accent assigned to the item under focus (Selkirk, 2007). In American English, an information-focused item is assigned a high pitch accent, indicated as H* target within Autosegmental-Metrical approach (AM) (Pierrehumbre, 1980; Ladd, 2008). However, a contrastive-focused item carries a low pitch accent followed by a high pitch-accent target aligned to the stressed syllable of that item (L+H*) (Pierrehumbert & Hirschberg, 1990; Selkirk, 2002). Although these studies and similar studies found that information and contrastive/corrective focus might be associated with a specific pitch accent in a given language, there are high potentialities that both types of focus can be assigned with a similar pitch accent as found by Hedberg and Sosa (2007). Hedberg and Sosa (2007) find that information focus and contrastive/corrective focus are both can be realized with L+H* pitch accent in American English.

This discrepancies in accent distribution have also been reported to be observed cross-dialectally. Chahal (2001), for example, finds that pre-focus and post-focus words are deaccented in Lebanese Arabic, whereas their counterparts in Egyptian Arabic are compressed in F0 as found by Hellmuth (2006b). In both Arabic dialects, there were, however, no default pitch accents associated with either information focus or contrastive/corrective focus. For example, Hellmuth (2006b) finds that information and contrastive/corrective focus are realized with L+H* targets, similar to the utterance with items that also carry given information in the discourse.

The question of whether focus has an effect on accent distribution in Taifi Arabic is still not understood yet. Therefore, the current study aims to fill in this gap. In the following sub-section, a brief introduction to Taifi Arabic is presented.

2.2 Taifi Arabic

Taifi Arabic in this present paper refers to an (urban) Hijazi Arabic dialect, spoken in Taif city, located in the western region of Kingdom of Saudi Arabia. The number of population of Taif is about 993.8 thousand. Taifi Arabic shows similarities and differences, comparing with Standad Arabic and other Arabic dialects (see
El-Yasin, 1985 and references therein). For example, in Standard Arabic, the basic word order is assumed to be VSO word order. However, the basic word order in most Arabic dialects including Taifi Arabic is SVO (see Alotaibi, 2014). Another difference between Taifi Arabic and Standard Arabic is related to the structural case. That is, Standard Arabic marks structural case overtly, whereas Arabic dialects including Taifi Arabic do not. For example, nominative, accusative and genitive cases are overtly spelt out on nouns and some modifiers in Standard Arabic (see Bardeas, 2009; Aoun et al., 2009).

There are also similarities across Arabic dialects including Standard Arabic. Arabic dialects in general are stress-accent language (McCarthy, 1979; Watson, 2002). Stress is used at the lexical level in which one of the syllables is realized with higher F0, longer duration and stronger intensity (Mitchell, 1960; de Jong & Zawaydeh, 1999; Al-Ani, 1992; Hellmuth, 2006b). In addition, intonational pitch accent phonologically associate with the lexically stressed syllable (Hellmuth, 2006; Alzaidi et al., 2019).

Stress assignment is predictable in Arabic. It is determined based on (1) syllable weight and (2) syllable position in the lexical word. In ‘urban’ Hijazi Arabic, stress falls on a final syllable if it is superheavy (CVVC or CVCC), else on a heavy penultimate (CVV or CVC) (Abaalkhail, 1998). The stress assignment rules are summarized in Table 1 below.

Table 1. Word-level stress assignment in urban Hijazi Arabic. A diacritic “’” indicates the stress location, a dot indicates a syllable boundary and PL stands for plural.

<table>
<thead>
<tr>
<th>Rule</th>
<th>TA</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stress on a final superheavy</td>
<td>‘ka:’bi:r</td>
<td>big</td>
</tr>
<tr>
<td>Stress on a heavy penult</td>
<td>‘mak.tab</td>
<td>an office</td>
</tr>
<tr>
<td>Stress on a heavy antepenult</td>
<td>‘sa:ba:kum</td>
<td>he left you (PL)</td>
</tr>
<tr>
<td>Stress on a light penult</td>
<td>‘sa:ma</td>
<td>sky</td>
</tr>
<tr>
<td>Stress on a light antipenult</td>
<td>‘qa:ma:ri</td>
<td>My moon</td>
</tr>
</tbody>
</table>

Another similarity between Arabic dialects including Standard Arabic is concerning the syntactic realization of information focus and contrastive focus. In syntax, Taifi Arabic similar to other Arabic dialects including Standard Arabic is not an obligatory focus marking language. There are cleft structures which might be used to encode focus, but not necessary (see Alzaidi et al., 2019; Hellmuth, 2010, for more details). An item carrying either Information focus or contrastive focus in a TA structure can be realized realized in-situ, as exemplified in (2 and 3) below.

2) a. Khaled qa:bal mi:n?
   Khaled met who?
   “Whom did Khaled meet?”
   b. Khaled qa:bal [Faisal]$_{NF}$.    Narrow-information focus

   Khaled met who? Rami?
   “Whom did Khaled meet? Rami?”
   b. Khaled qa:bal [Faisal]$_{CF}$.    Narrow-contrastive focus

In the examples (2) and (3), the information- and contrastive-focused item are realized in-situ, and hence, it may indicate that prosodic instruments can be used by the speakers of Taifi Arabic to encode focus. Alzaidi et al. (2019) made systematic comparisons across three focus conditions (neutral focus, information focus and contrastive focus) in excursion size, mean F0, maximum F0, mean intensity and duration. In their detailed acoustic analyses, they find the followings. (1) Information focus and contrastive focus were realized with an expanded excursion size and higher F0 than that of their counterparts under neutral-focus condition. (2) The word under contrastive focus was realized in more expanded excursion size, higher F0, stronger intensity and longer duration than its counterpart under information focus. (3) When focus is sentence-initial only, the post-focus words are compressed in F0. (4) No post-focus compression was detected when focus is sentence-penultimate. However, it is still not clear whether the analyses of each speakers show cases in which post-focus words are either deaccented or compressed in F0, similar to what is found in Lebanese (Chahal, 2001) and Egyptian Arabic (Hellmuth, 2006). Therefore, the present paper presents a detailed phonological analyses of the F0 contours of 1200 utterances produced by 16 native speakers of Taifi Arabic to determine the
pitch accent distribution in the focus structures with information focus, contrastive focus and without focus. This is to find whether focus as an IS aspect can affect the pitch accent distribution of the structures in this Arabic dialect. The following section presents the methodology adopted to conduct the production experiment.

3. Methodology

3.1 Test Materials

To elicit narrow information and contrastive focus, we used question-answer paradigms. Three target sentences, presented in (4), were embedded in five focus contexts: neutral-focus, initial information-focus, initial contrastive-focus, penultimate information-focus and penultimate contrastive-focus context, as illustrated in Table 2 below.

4) a. Ra:mi mar Li:na ʔams  
   Rami visited Lina yesterday

   b. Rana sawwat maryu:l li Manala
   Rana made school-dress for Manal

   c. Ra:mi Ha:jer li-landan al-ba:ri
   Rami emigrated to-London yesterday

Table 2. Target sentences with their translations. BF stands for neutral focus, NF stands for information focus and CF stands for contrastive focus.

<table>
<thead>
<tr>
<th>Prompt Question</th>
<th>Target Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waij s'ar?</td>
<td>[Ra:mi mar Li:na ʔams]_{BF}</td>
</tr>
<tr>
<td>‘What happened?’</td>
<td>‘Rami visited Lina yesterday’</td>
</tr>
<tr>
<td>man mar Li:na ʔams?</td>
<td>[Ra:mi]_{BF} mar Li:na ʔams</td>
</tr>
<tr>
<td>‘Who visited Lina yesterday?’</td>
<td>‘Rami visited Lina yesterday’</td>
</tr>
<tr>
<td>man mar Li:na ʔams? Marwa:n?</td>
<td>[Ra:mi]_{CF} mar Li:na ʔams</td>
</tr>
<tr>
<td>‘Who visited Lina yesterday? Marwan?’</td>
<td>‘Rami visited Lina yesterday’</td>
</tr>
<tr>
<td>man Ra:mi mar ʔams?</td>
<td>Ra:mi mar [Li:na]_{CF} ʔams</td>
</tr>
<tr>
<td>‘Who did Rami visit yesterday?’</td>
<td>‘Rami visited Lina yesterday’</td>
</tr>
<tr>
<td>man Ra:mi mar ʔams? Rana?</td>
<td>Ra:mi mar [Li:na]_{CF} ʔams</td>
</tr>
<tr>
<td>‘Who did Rami visit yesterday? Rana?’</td>
<td>‘Rami visited Lina yesterday’</td>
</tr>
</tbody>
</table>

To create appropriate contexts in the subject’s mind, each question-answer pair was preceded by an anecdote written in Taifi Arabic. The subjects were asked to read this short anecdote silently. When they finished, they moved on to see the question-answer pair on a different slide, and then were asked to read the answer to the question in a natural way. A sample anecdote is shown in (6) (see Appendix A for all the scenarios used). Each subject (16 participants) repeated each target sentence in each focus condition five times. The total number of utterances produced by the 16 participants are 1200 sentence (3 target sentence x 5 foci x 16 participants x 5 repetitions = 1200 sentences). REFP stands for reflexive pronoun, and NEG for negative form.

5) a. A sample of the type of ‘anecdotes’ in Taifi Arabic.
   أمس رامي راح جده وم لينا هناك. لهم فترة طويلة ما زارو بعض رامي و لينا آخوان. رامي عاش في الطائف ولينا عاش في جدة.

   b. Glossing:
   Ra:mi w Li:na ʔakhwa:n Ra:mi ʕa:ish fi ʔal-ťa:if w Li:na
   Rami and Lina brothers Rami lives in the-Taifi and Lina

   ʕa:ishah fi Jeddah lahum fatrah ʕa:wi:lah ma za:ru baʕad
   lives in Jeddah since period Long not visit each-other

   ʔams R:mi ra: h Jeddah w mar Li:na hinak
   yesterday Rami went Jeddah and visited Lina there

   ‘Rami and Lina are brothers. Rami has lived in Taifi and Lina has lived in Jeddah. They had not visited each other for a long time. Yesterday, Rami went to Jeddah and visited Lina there.’
3.2 Participants
Eight females and eight males (= 16 participants) participated in the experiment (mean age = 28.06, SD = 4.85 years). All participants were born in Taif.

3.3 Recording Procedures
The recordings were made in a quiet room in the homes of the participants. A Zoom H2 recorder with 44.1 kHz sampling frequency, a 16-bit resolution, and at distance of 0.5 meter from the speaker’s mouth was used. The entire set of data were saved as WAV files and transferred immediately to a MacBook Pro laptop for analysis. Materials were presented in slides, with one short anecdote per slide. After reading the projected anecdote, a question on a factual point in the anecdote with its answer were presented on another slide. Participants were asked to read a target sentence as an answer to a prompt question asked by the researcher. The test materials were presented in random order, and a different order was used for each subject. Only one question–answer pair was projected at a time. We added 35 mini–dialogues as fillers to prevent order effects.

3.4 Annotation
All utterances of the target sentences were analyzed and transcribed. The accent distributions were determined by the researcher who is a native speaker of Taifi Arabic. All the utterances were labelled with their relevant pitch accents based on the auditory impression (Veilleux, Shattuck-Hufnagel, & Brugos, 2006). In order to avoid labeller bias, we used ProsodyPro script (Xu, 2013) to extract the values of the local F0 maximum of every syllable of every word in the utterances. Following Hellmuth (2006a), deaccenting is indicated by the absence of an F0 maximum (i.e., its F0 maximum would be as same as the F0 value realized as the start of the words). This step was to support our labelling that was based on the auditory impression.

In our description of F0 contours, we use phonological targets L(ow) and H(igh) tone in Autosegmental-Metrical framework (Pierrehumbert, 1980; Ladd, 2008). Within this framework, an intonational contour is analyzed in terms of these targets that are aligned with specific location in the segmental string. Taifi Arabic has not received any AM analyses. Our description of the data in AM is broadly to describe the general prosodic patterns observed in the TA in terms of pitch accents (H*, L+H*) and phrase and boundary tone (L- and L%). These are defined in (6) below.

6) a. L+H*: F0 starts from a very low point in the speaker’s range to the high point.
   b. H*: F0 starts from a mid-point in the speaker’s range to a high point.
   c. L*: F0 is absent (i.e., no F0 peak).
   d. L-L%: represents a fall to the lowest part of the speaker’s pitch range. It is typical of neutral declarative statements.

4. Results and Discussion
Table 3 reveals the results of the distributional analysis of the data collected from the production experiment. The data reveals five observations. First, the data reveals a clear trend: in neutral-focus utterances, all the content words are produced with a pitch accent (100%). Second, it also shows that every content word is pitch-accented in the utterances with and without focus (= 1026 out of 1200 sentence (88.5%)). This indicates that deaccentuation is not a common strategy used by speakers of Taifi Arabic to mark focus, as the case in Lebanese Arabic (Chahal, 2001). Third, when focus is sentence-initial, 111 out of 480 utterances (23.12%) display deaccenting of the post-focus words. It shows that deaccentuation of the post-focus words were observed in the data more in the utterances with narrow contrastive focus than in the utterances with narrow information focus (47 (19.58%) vs. 64 (26.67%)) Fourth, the table reveals that the two-pointed hat pattern was found in the data when the focused word is sentence-penultimate (27 out of 480 utterances = 5.62%). It shows that the two pointed-hat patterns were observed more with contrastive focus than with information focus (10 utterances (4.17%) vs. 17 utterances (7.08%)). This pattern has not been observed in either Egyptian (Hellmuth, 2006b) or Lebanese Arabic (Chahal, 2001). Finally, Table 3 shows that there were no utterances in which the pitch accents of the pre-focus words were deaccented due to the prosodic focus. This is unlike to what is observed in Lebanese Arabic; in which the pre-focus words are deaccented (Chahal, 2001). As found by Hellmuth (2006b), focus does not deaccent pre-focus words in Egyptian Arabic. Therefore, Egyptian and Taifi Arabic are different from Lebanese Arabic in terms of the deaccentuation of pre-focus words.
Table 3. Accent distribution for the target sentences in all three focus conditions: neutral-focus, information-focus and contrastive-focus conditions at two sentential positions: initial and penultimate. Accented words are printed in uppercase. The maximum number is 80 (= the total number of utterances produced by 16 speakers per condition). Neu, Info and Con stands for neutral, information and contrastive focus respectively.

<table>
<thead>
<tr>
<th>Sentence Focus Conditions</th>
<th>Neutral</th>
<th>Initial Focus</th>
<th>Penultimate Focus</th>
</tr>
</thead>
<tbody>
<tr>
<td>RA:MI MAR LI:NA ?AMS</td>
<td>80</td>
<td>73</td>
<td>59</td>
</tr>
<tr>
<td>RA:MI mar li:na ?ams</td>
<td>0</td>
<td>7</td>
<td>21</td>
</tr>
<tr>
<td>RA:MI mar LI:NA ?ams</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>ra:mi mar LI:NA ?ams</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>RANA SAWWAT MARYU: L LI MANAL</td>
<td>80</td>
<td>55</td>
<td>57</td>
</tr>
<tr>
<td>RANA sawwat MARYU: L li manal</td>
<td>0</td>
<td>25</td>
<td>23</td>
</tr>
<tr>
<td>RANA sawwat MARYU: L li manal</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>rana sawwar MARYU: L li manal</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>RA:MI HA:JAR LI LANDAN AL-BARIH</td>
<td>80</td>
<td>65</td>
<td>60</td>
</tr>
<tr>
<td>RA:MI ha:jar li landan al-barih</td>
<td>0</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>RA:MI ha:jar li LANDAN al-barih</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>ra:mi ha:jar li LANDAN al-barih</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

To provide an idea of the kinds of intonation patterns the speakers of Taifi Arabic produced, Figures 1, 2, 3 and 4 present the F0 contours for utterances elicited with and without focus. Those speakers are selected based on the F0 patterns observed in Table 3. The figures below display several tunes produced by TA speakers.

Starting with neutral-focus utterance, there are two F0 patterns. First, a pattern with three F0 maxima can be recognized in the data, a fall on the sentence-initial words, followed by a second fall on the verb, then followed by a third fall on the penultimate content word. The peak of the final fall on the sentence-penultimate word has lower scaling compared to the first and the second one. That pattern was produced by all speakers apart from speaker coded P2 (see Figure 1a, 1d, 1g, 3d, 3h, 4g). Speaker P2 produced neutral-focus utterances with three F0 maxima in which the final F0 peak is the highest, as seen in Figure 2a, 2d, and 2g. This pattern is also observed in the F0 contour shown in Figure 4a, produced by speaker P4.

The F0 contours of the utterances with narrow focus reveal different types of tunes produced by the speakers. First, we observe that when focus is sentence-initial, all the content words are pitch-accented in which the highest pitch accent is placed on the stressed syllable of the focused word. This is seen in Figure 1b, 1f, 1h, 1i, 2b, 2e, 2f, 2h, 2i, 3b, 3c, 3e, 3f, 3h, 3i, 4b, 4f, 4h and 4i. In all these figures, it is noticed that the pitch accents of the post-focus words are more compressed than their counterparts under neutral-focus condition. Second, information and contrastive focus condition enable optional deaccentuation of post-focus words. The F0 starts declining at about the offset of the stressed syllable of the word under focus till it reaches the lowest F0 at the end of the utterance. This pattern is known as a pointed-hat pattern (t’Hart et al., 1990). This is visible in Figure 1c, 1e, 2c, 4c and 4e. As shown in Table 3 above, 23.12% of the utterances with focus were produced with deaccentuation of post-focus words.

Another F0 pattern observed in the data is the pointed-hat contour with two accents (t’Hart et al., 1990). This pattern is observed only in the utterances with penultimate contrastive focus, as in Figure 1k, 1l, 1m and 1k. In Dutch, this pattern represents one of the intonational contours of the neutral-focus utterance (t’Hart et al., 1990).

The final tune shape observed in the data is observed in the utterances with sentence-penultimate focus. This pattern is characterized by a noticeable compression of the pitch accents of the pre-focus words, as visibly clear in Figure 1o, 2l and 3m.
Figure 1. Male participant (coded P1).
Figure 2. Female participant (coded P2).
Figure 3. Male participant (coded P3).
The analyses of pitch accent distribution in the present study reveal two interesting findings. First, we found that an item under information and contrastive focus are always accented. This is not uncommon cross-linguistically, as observed in many intonational languages such as Danish and English (Nooteboom & Kruyt, 1987; Nooteboom & Terken, 1982; Terken, 1984; Terken & Nooteboom, 1987) and cross-dialectally as found in Egyptian (Hellmuth, 2006b) and Lebanese Arabic (Chahal, 2001). In TA, the differences between information
and contrastive focus mainly in terms of phonetic enhancement of on-focus region, as examined by Alzaidi et al. (2019). This is because the word under focus is either as H* or L+H*, as shown in Figures 1, 2, 3 and 4. This finding is not unexpected. Unlike English, Arabic dialects include Egyptian and Lebanese Arabic do not place a special type of pitch accent on the focused words. That is, the focused word is found to be associated with either H* or L+H* in Lebanese Arabic (Chahal, 2001), and with L+H* in Egyptian Arabic similar to other content words in the same utterance (Hellmuth, 2006b).

Second, our analyses of accent distribution confirm experimentally that speakers of Taifi Arabic make a choice between different possible contours to express their attitudes, similar to what is observed, for example, in Dutch by (‘t Hart & Collier, 1975). The choices available to the speakers of Taifi Arabic are more than the choices available to either speakers of Egyptian Arabic or Lebanese Arabic, reported by Chahal and Hellmuth (2014). For example, in Egyptian Arabic the most common intonational pattern of neutral declarative is an overall falling pattern, with a pitch accent on each content word, and typically ending with falling pitch, analyzed as a L-L% phrase-boundary-tone sequence (Hellmuth, 2006b). This pattern is one of the two patterns available to TA speakers to express neutral declarative. Furthermore, a typical contour of neutral declarative in Lebanese Arabic is a flat-hat pattern, in which there is an accent-lending rise on the first target word and an accent-lending fall on the final word in the utterance (Chahal, 2001). The flat-hat pattern was not found in TA (as discussed in §5.3.1 above) and also was not found in Egyptian Arabic by Hellmuth (2006b). Interestingly, the present study found that there is a resemblance between TA and Lebanese Arabic in the intonational contours of the utterance with narrow initial focus. That is the ‘pointed-hat’ pattern, in which the focused word is realized with a pitch accent (H* of L+H*) and the words following focus are deaccented. However, the deaccenting tune in Taifi Arabic is very rare (23.12%), as shown in Table 4 summarized the pitch accent distribution presented in §5.3.1. This percentage is slightly similar to what it is observed in English (20–25%) analyzed by Bard and Aylett (1999). However, it is more than what is observed in Italian (6.5%) analyzed by Avesani and Vayra (2005). Unlike Lebanese Arabic, the pre-focus words are not deaccented in TA.

Table 4. Pitch-accent distribution in percentage.

<table>
<thead>
<tr>
<th>Focus region</th>
<th>Focus conditions</th>
<th>Information focus</th>
<th>Contrastive focus</th>
</tr>
</thead>
<tbody>
<tr>
<td>On-focus</td>
<td>Pitch-accented</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Post-focus</td>
<td>Pitch-accented</td>
<td>80.42%</td>
<td>73.33%</td>
</tr>
<tr>
<td></td>
<td>Deaccented</td>
<td>19.58%</td>
<td>26.67%</td>
</tr>
<tr>
<td>Pre-focus</td>
<td>Pitch-accented</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Deaccented</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Based on the findings of the present studies and recent Chahal’s (2001) and Hellmuth’s (2006b) findings, Table 5 lists the similarities and differences in tunes in Egyptian, Taifi and Arabic dialects.

Table 5. Patterns observed in Arabic dialects studies far: Egyptian, Taifi and Lebanese Arabic.

<table>
<thead>
<tr>
<th>Arabic dialects</th>
<th>Tunes/Patterns</th>
<th>Declination/Overall falling</th>
<th>Hat pattern</th>
<th>A pointed-hat</th>
<th>A Two-pointed hat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egyptian (Hellmuth, 2006b)</td>
<td>✓</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>✓</td>
</tr>
<tr>
<td>Taifi</td>
<td>✓</td>
<td>x</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Lebanese (Chahal, 2001)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
<td></td>
</tr>
</tbody>
</table>

5. Conclusion

The present findings showed that there is variability in tunes in focus intonation in TA. Although there is a family resemblance between Egyptian, Taifi and Lebanese Arabic, there are differences, in particular, in the pitch accent distribution in the utterances with non-final focus. For example, certain prosodic patterns in TA were not found in either Egyptian or Lebanese Arabic, such as a two-pointed hat pattern observed in utterances with penultimate focus. Second, the present study showed that focus had a statistically significant effect on the F0 peak alignment and the F0 peak location only in the post-focus region, similar to what is found in Egyptian Arabic by (Hellmuth, 2006a). Finally, the results of the perception experiment presented in the present study demonstrated the effectiveness of PFC in focus perception; i.e., its presence in initial focus lead to over 93%
focus recognition, whereas the lack of it in penultimate focus lead to less than 83%.

These findings, when considered in conjunction with other recent findings, suggest that (1) there are variations in the accent distribution between Arabic dialects that need to be taken into account in an overall intonational model of Arabic dialects, (2) information focus and contrastive focus in Arabic dialects studied so far are not distinguished based on the type of pitch accents. We hope that this paper shed light on the differences in accent distribution across few Arabic dialects, which future studies on Arabic dialects, that have not investigated yet, will be able to explore more the accent distribution accent and also examine the perception of focus to verify the importance of prosodic cues to focus found in the recent production experiments.

References


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Appendix A

Test Materials

A.1. Neutral Focus

Scenario 1:

أمس رامي راح جده و ماري لينا هناك. لهم فترة طويلة ما زارو بعض رامي و لينا أخوان. رامي عاش في الطائف و لينا عاش في جدة.

Rami and Lina are brothers. Rami lives in Taifi and Lina lives in Jeddah. They had not visited each other for a long time. Yesterday, Rami went to Jeddah and visited Lina there.

Target sentence:

(1) Rami mar Lina ?ams

Rami visited Lina yesterday

‘Rami visited Lina yesterday.’
Scenario 2:

Rana and Manal are sisters. Rana is older than Manal. Their father died and their mother is ill and she is in hospital. Because of being poor, Rana dropped out of school and works as a tailor in order to have money. Manal has just enrolled in school. The school requires a specific school dress. Therefore, Rana made a school dress for Manal.

Target sentence:

(2) **Rana sawwat maryu:l li-Mana:l**

“Rana made a school dress for Manal.”

A.2. Information focus (sentence-initial word)

Scenario 1:

Rami, Rana and Lina are brothers. Rami lives in Taifi. Lina and Rana live in Jeddah and each one of them lives in a separate house. Rami likes Rana a lot. But Lina, Rami does not like. So when Rami visits Jeddah, he never visits Lina. Rami and Rana visit each other and contact each other continuously. But yesterday, without anyone expected, Rami went to Jeddah, visited and spent time with Lina there.

Target sentence:

(1) **Rami mar Li:na ?ams**

‘Rami visited Lina yesterday.’

Scenario 2:

Rana is a clever tailor. A lot of people ask her to make dresses for the. Manal is a secondary school student. Before the school year started, she went to Rana and asked her to make a school dress for her. Rana made a school dress for her.

Target sentence:

(1) **Rana sawwat maryu:l li-Mana:l**

Rana made school-dress for-Manal

1. “Rana made a school dress for Manal.”

Scenario 3:

Rami was living in Egypt. He was working there. His job was good and he got good salary. But one month ago, he quit his job. He emigrated to London yesterday.

Target sentence:

(3) **Rami ha:jer li-lan.dan al-ba:.rih**

‘Rami emigrated to London yesterday.’
Rami and Marwan are brothers. All of them were teachers of Arabic language in Egypt. Rami quit his job and emigrated to London yesterday. As for Rami, he quit his job and works in a factory.

Target sentence:
(1) Ra:mi ha:jer li-lan.dan al-ba:.ri
Rami emigrated to-London yesterday
‘Rami emigrated to London yesterday.’

A.3. Information focus (sentence-penultimate word)

Scenario 1:
لهم فترة طولية ما يتواصلوا مع بعض. أمس رامي راح جده و مر لينا . رامي عايش في الطائف و لينا عايشة في جد.رامي عايش في جد. رامي أعطى لينا اسمها لينا هناك.
Rami has one sister whose name is Lina. Rami lives in Taifi and Lina lives in Jeddah. They had not visited each other for a long time. Yesterday, Rami went to Jeddah and visited Lina there.

Target sentence:
(2) Ra:mi mar Li:na ?ams
Rami visited Lina yesterday
‘Rami visited Lina yesterday.’

Scenario 2:
رنا خياطة ماهره. وناس كثير تطلب منها تسويع فساتين. مثل طالبة ثانوية قبل ما تبدأ المدرسة طلبت من رنا تسويع فساتين. وبنالها رنا صوت مريح لمنال.
Rana is a clever tailor. A lot of people ask her to make dresses for them. Manal is a secondary school student. Before the school year started, Manal asked Rana to make a school dress for her. Therefore, Rana made a school dress for Manal.

Target sentence:
(2) Rana sawwat maryuu:l li-Mana:l
Rana made school-dress for-Manal
“Rana made a school dress for Manal.”

Scenario 3:
رامي كان عايش في مصر. كان شغل مدرسة عربية. وكان رايته حلو. لكن قبل شهر رامي فصل من وظيفته و هاجر للندن امرار.
Rami was living in Egypt. He was a teacher of Arabic language. A month ago, he quit his job and he emigrated to London yesterday.

Target sentence:
(2) Ra:mi ha:jer li-lan.dan al-ba:.ri
Rami emigrated to-London yesterday
‘Rami emigrated to London yesterday.’

A.4. Contrastive focus (sentence-initial word)

Scenario 1:
رامي يحب رنا كثير. ليس لينا رامي و رنا و لينا أخوان. رامي عايش في الطائف و لينا و رنا عايشين في جد. كل وحدهم في بيت مستقل.
Rami, Rana and Lina are brothers. Rami lives in Taifi. Lina and Rana live in Jeddah and each one of them lives in a separate house. Rami likes Rana a lot. But Lina, Rami does not like. So when Rami visits Jeddah, he never visits Lina. Rami and Rana visit each other and contact each other continuously. But yesterday, without anyone expected, Rami went to Jeddah, visited and spent time with Lina there.

Target sentence:
(3) Ra:mi mar Li:na ?ams
Rami visited Lina yesterday
‘Rami visited Lina yesterday.’

Scenario 2:
Lina and Manal are sisters. All of them are secondary school students. Each one of them went to a tailor to make a school dress. Lina went to Nawal to make her a school dress. As for Manal, she went to Rana to make a school dress for her.

Target sentence:
(3) Rana sawwat maryū:l li-Mana:l
2. Rana made school-dress for-Manal
3. “Rana made a school dress for Manal.”

Scenario 3:
Rami and Marwan were working in Egypt. Their salary was good. But after the revolution, They quitted from their job. Therefore, Rami emigrated to London yesterday and Marwan to Saudi.

Target sentence:
(3) Ra:mi ha:jer li-lan.dan al-ba:.ri
Rami emigrated to-London yesterday
‘Rami emigrated to London yesterday.’

A.5. Contrastive focus (sentence-penultimate word)

Scenario 1:
Rami and Marwan exchanged visits. But Rami does not visit Lina because Lina makes troubles a lot. Due to that, Rami does not visit her when we goes to Jeddah. But yesterday and without one’s knowledge, Rami went to Jeddah and visited Lina and spent time with her there.

Target sentence:
(3) Ra:mi mar Li:na ?ams
Rami visited Lina yesterday
‘Rami visited Lina yesterday.’

Scenario 2:
Manal is a secondary school student. She asked her mother for the tailor Rana to make a school dress and an apron for her. Her mother accepted that Rana made a school dress for her but she refused to let Rana to make an apron for Manal. Therefore, Rana made a school dress for Manal only.

Target sentence:
(4) Rana sawwat maryū:l li-Mana:l
4. Rana made school-dress for-Manal
5. “Rana made a school dress for Manal.”
Rami and Marwan were working in Egypt. Their salary was good. But one month ago, they quit their job. Therefore, Rami emigrated to London yesterday and Marwan to Saudi.

Target sentence:

(4) Ra:mi  ḥa:jer   li-lan.  dan  al-ba:.rh
   Rami  emigrated to-London yesterday
   ‘Rami emigrated to London yesterday.’

Notes
Note 1. There is another focus structure termed predicate-focus structure in which the structure is divided into topic-comment division. This type of structure is outside the scope of the present study since our experimental tests materials did not contain that type of structure. It is widely assumed that the prosodic patterns of predicate-focus structure are similar to sentence-focus structure in many languages including the language under investigation (see Alzaidi, 2014, Section 6.3.1).

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