The (absence of) prosodic reflexes of given/new information status in Egyptian Arabic.

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1   Introduction

This paper explores the phonetic detail of words uttered in two types of focus context in Egyptian Arabic, in order to quantify the nature of the prosodic reflexes (if any) of the distinction between given vs. new information status. The issue is of interest firstly because cross-linguistically languages vary as to whether or not the given/new distinction is prosodically marked by means of 'de-accenting' (Ladd 1996, Swerts et al 2002), and secondly because it has been shown that EA is a language which tends not to 'de-accent' content words in other contexts conducive to de-accenting (such as in fast or spontaneous speech, Hellmuth 2006b). Prior grammatical descriptions of EA suggest that there are categorical prosodic reflexes of 'focus' in EA, but this observation appears to conflict with the results of instrumental studies which suggest only gradient prosodic reflexes (in the form of expansion or reduction of the F0 excursion in accents). However, the notion of 'focus' is defined differently among the various studies, and it is not clear what type(s) of contexts result in either the categorical or gradient effects described. Discussion of this literature and the definitions of focus adopted in this paper are set out in Section 2 below.

The main body of this paper (Section 3) describes the methodology and results of an experimental study of F0 excursion in target words in a corpus of read speech, in which focus status was systematically varied, according to two definitions of focus: i) contrastive focus and ii) information focus (the given/new distinction). The aim was to determine whether categorical or gradient reflexes resulted from the given/new status of the word itself or its position *following* a contrastive focus (or both). The results suggest that there is no categorical de-accenting in EA whatsoever (in any condition) but that there are gradient prosodic reflexes of contrastive focus in the form of pitch range manipulation (all words are accented, but pitch accents on words in focus are produced in an expanded pitch range, and those on words following the focus, in a compressed pitch range).

In contrast, however, there appear to be neither categorical nor gradient prosodic reflexes of the given/new distinction in EA. This contrasts with the findings for Lebanese Arabic (Chahal 2001), for example, and suggests that EA should be classified typologically with languages which do not de-accent given items. Section 4 of this paper sets out additional evidence from non-experimental data in support of this classification, and discusses two possible explanations as to why the given/new distinction, which is routinely marked prosodically in other languages, might not be marked in EA: one explanation is rooted in a notion of functional complementarity among various modules of the grammar (if an information structure distinction can be expressed by syntactic means no prosodic reflex is required), and the other in the phonology of the language (prosodic words must obligatorily be accented in EA).

The study is framed within an autosegmental-metrical (AM) view of intonation (Ladd 1996), in which the intonation contour of an utterance is analysed as a series of high (H) or low (L) pitch targets. The alignment of pitch targets with the segmental string is determined according to their phonological association with prominent positions in metrical structure. *Pitch accents* (denoted with a * symbol) can be either monotonal (H*, L*) or maximally bitonal (e.g. L+H*) and associate with the stressed syllable of one or more words in an utterance. Boundary tones

and phrase tones associate with the edges of metrical constituents at different levels (such as the prosodic word, phonological phrase and intonational phrase).[1]

A terminological distinction is thus made throughout the paper made between *stress* which is a word-level property, and *accent*, which is (usually) a phrase-level property; in most intonation languages, whilst all words bear lexical stress not every word has its lexical stress realised by means of an accent. In English the distinction has different phonetic correlates: stressed syllables are produced with greater duration and intensity than unstressed syllables, whilst the stressed syllable of an accented word additionally bears a salient pitch movement (a 'pitch accent' or 'accent').[2]

2   Background to the study
2.1   Prosodic reflexes of given/new information status
In most Germanic languages, words which are discourse 'given' in context are routinely 'de-accented', in the sense that a content word which one would normally expect to be accented is realised without an accent (Ladd 1980). The consistency of this effect in Germanic languages has led to the widely held notion that intonational pitch accents are inherently focus-marking (e.g. Gussenhoven 2004). However, Ladd (1996) demonstrates convincingly that the contexts which in Germanic languages trigger de-accenting do not do so in other languages. The 'non-de-accenting' languages that he cites are largely (though not exclusively) of the Romance family. To illustrate, in English if a word is *repeated* from earlier in the discourse it fails to be accented, as shown in (1); here the word "German" in B's reply is realised without an accent because it is repeated from A's question (accented words in small capitals, Ladd 1996:175):

(1)   A: I found an article for you in a German journal.   *English*
       B: I don't READ German.

Halliday (1967) distinguishes between cases like this where a word is actually repeated from earlier in the discourse ('textually given') and cases where the concept that the word denotes is inferable from the context ('situationally given'). Ladd (1996) points out that in Germanic languages de-accenting is also observed on semantically weak items such as indefinite pronouns and generic terms. This pattern of not accenting low-information-content words, whether due to givenness or generic semantic weakness, is not found in all languages. For example, many Romance languages do not modify prominence patterns to reflect givenness (Ladd 1996:176):[3]

(2)   [… o să vedem] ce   AVETI   si   ce   nu AVETI   *Romanian*
       […we'll see]   what you.have and what not you.have
       'so let's see what you HAVE and what you don't HAVE'

One aim of the study described here is to classify EA according to Ladd's typology of languages, by determining whether given items in EA are realised with or without an accent.

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[1] For an AM analysis of colloquial EA see Hellmuth (2006b); for AM analyses of the EA pronunciation of Modern Standard Arabic see El Zarka (1997) and Rifaat (2004).
[2] Not to be confused with the notion of 'a pitch accent language' which denotes a language in which pitch plays a role in the lexical specification of some morphemes; see Yip (2002) for clarification of this terminology.
[3] Cruttenden (2006) also notes a lack of de-accenting in other Romance languages including Brazilian Portuguese and Chilean Spanish.

2.2   Defining focus

The distinction between given/new information status has been classified by many authors as a type of 'focus', a term which is itself however used to describe a wide range of different degrees of emphasis or highlighting (with much overlap of terminology between descriptions). One approach to the continuum of focus types is to think about it along two axes: the scope of the focus (how much of the sentence is highlighted) and the nature of the focus (what properties set the focus apart).

The *scope* of focus can be split into two categories: sentence focus and constituent focus, highlighting all of the sentence and some constituent part of it respectively (Moutouakil 1989:25-26). Ladd (1980, 1996) defines this scope distinction as broad vs. narrow focus: a broad focus utterance carries 'all new' information such that the whole sentence is in focus, but in a narrow focus utterance just some part is new or informative.[4] A parallel may also be drawn with the distinction between sentence focus and argument focus argued for by Sasse (1987) and Lambrecht (1994).

Turning to the *nature* of focus, Moutouakil (1989) notes that Modern Standard Arabic (MSA) makes a grammatical distinction between what he terms 'new focus' and 'contrastive focus'. A new focus highlights information *new* to the discourse whilst a contrastive focus highlights information which to some extent *contrasts* with information already available in the discourse. Moutouakil claims that in MSA a contrastively focussed item must obligatorily undergo syntactic movement, whereas only new information focus can be expressed in-situ (Moutouakil 1989:21; nuclear prominence marked in italics):

(4)   a.   *šaay-an*   šariba xaalid-un   contrastive focus
              tea-ACC   drank   Khalid-NOM
              "It was tea that Khalid drank"

       b.   šariba   xaalid-un   *šaay-an*   new focus
              drank   Khalid-NOM tea-ACC
              "Khalid drank tea."

Distributional syntactic evidence of this kind from a number of languages leads Kiss (1998) to similarly distinguish 'informational focus' (given vs. new information) from 'identificational focus' (contrastive and/or exhaustive identification).[5]

The examples of de-accenting of given items (in section 2.1) above tend to involve cases of constituent focus placed early in the sentence, which attracts the main prominence or nucleus of the utterance, and 'post-nuclear' items are de-accented. The target utterances elicited in the empirical study described below therefore involve constituent focus. This observation highlights a potential confound: are the de-accented words in the examples in section 2.1 de-accented because they are themselves given or because they follow a constituent focus? The

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[4] Note that there is potential for ambiguity between a broad focus utterance (with 'default' sentence-final prominence) and an utterance with narrow focus on the sentence-final constituent, unless disambiguated by additional paralinguistic emphasis (cf. discussion in Ladd 1996:199ff.). 'Percolation' of focus from a sentence-final nucleus to the rest of the phrase has been analysed by means of focus projection from the focussed item to all other items within the syntactic constituent of which it is a part (Selkirk 1984, Selkirk 1995).

[5] Kiss (1998) notes that MSA requires an identificational focus to be both exhaustive *and* contrastive (after Ouhalla 1994); investigation of prosodic correlates of this further distinction are beyond the scope of this paper. Moutouakil notes however that MSA is cross-linguistically unusual in providing a means to express contrastive focus with sentence-wide scope (by use of particles such as [?inna] 'indeed/verily').

fact that items of low semantic weight can be de-accented independently of any contrastive focus (Ladd 1996), suggests that it is indeed givenness which conditions de-accenting. Indeed for English, Selkirk (2000:247,251) has argued that a word following a contrastive focus but which is itself new to the discourse is usually accented.

In order to avoid this potential confound, the targets in the present study (direct objects in a simple subject-verb-object (SVO) sentence) were elicited positioned after two types of constituent focus (contrastive focus and information focus) and with both given and new status themselves. The resulting four conditions are illustrated in the table in (6) below. Here and in other illustrations below the two types of focus are abbreviated to [±f] for information focus (+f indicates new status, -f indicates given status), and [±F]for contrastive focus (+F indicates an utterance which contains a contrastive focus, -F indicates an utterance which does not contain a contrastive focus). This fourway split permits potential prosodic reflexes of givenness to be investigated independently of potential prosodic reflexes of position relative to a constituent focus.

(5)   Overview of experimental design (avoiding a 'givenness'/'post-focal' confound)

status/position of target (=object in SVO sentence):	target follows constituent *contrastive* focus on the subject [+F]	target follows constituent *information* focus on the subject [-F]
target is itself new in discourse [+f]	$S_{contrasted}$ V O_{new} [+F+f]	S_{new} V O_{new} [-F+f]
target is itself given in discourse [-f]	$S_{contrasted}$ V O_{given} [+F-f]	S_{new} V O_{given} [-F-f]

The working criteria used to define and/or identify the two types of focus during design of the datasets were the notion of 'givenness' for information focus and 'contrast among alternatives' for contrastive focus.[6] The most robust context for an item to be considered 'given' was deemed to be one in which it had been previously uttered in the same discourse chunk (e.g. in the same or preceding sentence), that is 'textually given', as opposed to 'situationally given' (Halliday 1967:23).[7] The most robust context for an item to be considered contrastively focussed was deemed to be one in which the focussed item was picked out from a set of two overt alternatives, in the spirit of Face's (2002:4) definition: "explicit contrast between an extremely limited set of two discourse elements". This was achieved by overt prior mention of the alternative ('Y does something. X does not.').

Whilst previous studies on the prosodic effects of focus in Arabic dialects exist, none have systematically explored whether information and contrastive focus are prosodically distinct.

2.3   The prosodic reflexes of focus in EA
As described in section 2.2, a commonly described prosodic reflex of constituent focus is 'mobility' of the nucleus, or main prominence, in a sentence. The default position for sentence prominence in other Arabic dialects has been shown to be on the final content word (Benkirane 1998 for Moroccan Arabic (MA), Chahal 2001 for Lebanese Arabic (LA)), but in these dialects the nucleus can also be moved to a non-final content word in order to highlight

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[6] These relate to the semantic definitions of focus in Schwarzschild (1999) and Rooth (1996) respectively (though neither author makes a distinction between two different types of focus).
[7] Situationally given items may also be de-accented in English (Brown 1983, Cruttenden 2006).

that item (MA: Ouhalla 1999, LA: Chahal 2001). There are some reports in descriptive grammars of EA to suggest that this kind of 'nuclear mobility' is also observed in EA. For example, Mitchell (1993:230) states that: "[English & Arabic] share the possibility of locating the nucleus differently among an unchanged form of words". Although he is generalising across Arabic dialects in this statement, the first example he gives is from EA (reproduced in (6) below), in which he points out that, whilst a final nucleus on [maSri] 'Egyptian' is typical, locating the nucleus on either [?itneen] 'two' or [gineeh] 'pounds' is "perfectly possible and natural" (Mitchell 1993:230):

(6)   ?itnéen   ginéeeh   máSri
         two   pounds   Egyptian
         'Two Egyptian pounds"

Crucially however, Mitchell does not specify whether material following the early nucleus is de-accented or not.

Heliel (1977:125,132) also describes nuclear mobility in EA as in (7) below (nucleus in bold type), and, in the terms employed here, suggests that contrastive focus is expressible in-situ by prosodic means in EA: "the place of the tonic in Arabic is not fixed but varies meaningfully.. creating an independent set of choices":

(7)   a.   ?a xu:k   **saafir**   imbaariH   *interested in travelling*
            brother-your   travelling   yesterday

      b.   ?a**xu:k**   saafir   imbaariH   *interested in the traveller*

      c.   ?axu:k   saafir   im**baariH**   *interested in time of travel*
            'Your brother travelled yesterday.'.

The consensus from the descriptive literature then, is that it is possible to express constituent contrastive focus in-situ by means of nucleus placement. The evidence from instrumental studies however appears to conflict with this conclusion.

Norlin (1989) elicited parallel renditions of an SVO sentence, embedded in different frame paragraphs in order to elicit statements with either sentence focus or constituent focus (on subject, verb or object), with a single speaker of EA.[8] He describes the F0 properties of the neutral declaratives and then documents in what ways the F0 contour of non-neutral utterances vary. Norlin found in all cases that the pitch movement on a focussed constituent was realised in a greater pitch range (that is, with increased F0 excursion) than that of its unfocussed counterpart in a neutral sentence. In words following the focussed constituent, he found that *pitch movements were always preserved* but were produced in a compressed pitch range (that is, with decreased F0 excursion) as compared to their counterparts in a neutral sentence. Statements with sentence-final constituent focus shared had the same pitch range as neutral statements in the pre-focus part of the utterance.[9]

Norlin's results suggest that constituent focus is expressed in EA by expanding F0 excursion on the focussed item and then by compressing F0 on following items, rather than de-accenting

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[8] Norlin also elicited questions but these are not discussed here since the present study involved only statements.
[9] That is, the effects of focus were directional, affecting the focussed item and linearly *subsequent* items only.

them completely. Thus in EA the focus/post-focus distinction is achieved by manipulating the pitch range of the whole of the remainder of the sentence, not just the focussed part.

The EA findings are paralleled in a study by Chahal (2001, 2003) of acoustic cues to focus in Lebanese Arabic (LA). Chahal elicited constituent focus in double-object sentences by means of a question-answer paradigm. She described potential categorical cues to focus such as insertion of a prosodic boundary and post-focal de-accenting, and measured four potential gradient cues: F0 (pitch), intensity (loudness), duration and F1/F2 values (vowel quality). whilst Chahal does record instances of categorical de-accenting and boundary insertion in LA, in addition she also found gradient cues to focus. All four correlates were *enhanced* in focussed words compared to their counterparts in a neutral sentence (F0 was higher, duration was longer, intensity was increased, and vowels were more dispersed) and *reduced* in non-focussed words compared to their counterparts in a neutral sentence (F0 was lower, duration was shorter, intensity was decreased, and vowels were more centralized).[10] She analyses these findings as 'hyperarticulation' of focussed words accompanied by under-articulation of non-focus words (Lindblom 1990).

Chahal's question-answer paradigm elicited exhaustive constituent focus on her primary target word, with other target words always given (repeated from the question). Unfortunately Norlin does not report the frame paragraphs he used, so we do not know what type of constituent focus was elicited, nor the given/new status of other elements in the sentence.

A key goal of the present study was thus to reproduce Norlin's results and clarify which type(s) of focus are marked by means of gradient pitch range manipulation in EA.

3   The empirical investigation
3.1   Methodology
To clarify the empirical facts of EA focus prosody, two lexically distinct SVO target sentences were each placed in four frame paragraphs designed to manipulate the focus structure of the target sentence. Both contrastive focus status (±F) of the subject of the sentence (referred to as the 'trigger') and information focus status (±f) of the direct object (the 'target') are varied, resulting in four possible F~f combinations between subject and object:

(8)   Four-way combination of FOCUS~focus conditions in target sentences.

	trigger (subject)	*target (object)*	
[+F+f]	+F ✓contrastive	+f new	Mum$_{[+F]}$ learns Greek$_{[+f]}$.
[-F+f]	-F no contrast	+f new	Mum$_{[-F]}$ learns Greek$_{[+f]}$.
[+F-f]	+F ✓contrastive	-f given	Mum$_{[+F]}$ learns Greek$_{[-f]}$.
[-F-f].	-F no contrast	-f given	Mum$_{[-F]}$ learns Greek$_{[-f]}$.

The two target sentences and the set of context paragraphs used in the experiment for each are shown in the tables in (9) and (10) below.[11] The working criteria used to create contexts eliciting information focus status and contrastive focus were as set out in section 2.2 above, namely: the 'target' object word was either mentioned for the first time in the target sentence

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[10] In contrast to Norlin, Chahal found that gradient acoustic cues were reduced on non-focal words both before *and* after a sentence-medial focussed constituent.
[11] The Arabic text of context paragraphs is provided in Hellmuth (2006b).

(+f) or uttered previously in the discourse (-f); the 'trigger' subject word was either overtly contrasted with another referent mentioned previously in the discourse (+F) or not (-F).[12]

The subject trigger word was designed to be new [+f] in all contexts, by alternating between the more formal [?ummi] 'my mother' and more colloquial [maama] 'mum'. The difference in register (formal vs. colloquial) between the two was deemed sufficient to prevent interpretation of [maama] as textually given. Although 'situational givenness' has been suggested to be sufficient to induce de-accenting in English (see footnote 7 above), crucially, in these 'trigger' words it is a contrastive focus distinction (±F) that is required for the purposes of the experiment. Repetition of the given object in -f contexts is slightly artificial, since the argument could be pronominalised as a clitic onto the verb, though not ungrammatical, and is required in order to allow comparison of segmentally parallel target words (but cf. discussion in section 4.2 below).

The sentence-final adverbial phrase [bil-layl] 'in the evenings/at night' was included in order to elicit a non-final pitch accent on the target word, since phrase-final pitch accents are known to be affected by their proximity to the phrase boundary (Chahal 2001). This final adverbial phrase was elicited as given in all paragraphs.

(9)   SVO sentences used in the focus experiment.

	⇓ trigger		⇓ target	
A	*mama*	*bitit9allim*	*yunaani*	*bil-layl*
	mum	learns	Greek	in-the-evening/night
	'Mum	is learning	Greek	in the evenings'
B	*mama*	*bitnayyim*	*in-nounou*	*bil-layl*
	mum	puts-to-bed	the-baby	in-the-evening/night
	'Mum	puts	the baby to bed	at night'

(10)   Context paragraphs used in the focus experiment.

A1	[+F+f]	'My colleague said they heard my dad went to university in the evenings but I told him no. *Mum is learning Greek in the evenings.* Dad sits at home and watches TV.'
A2	[-F+f]	'My mother loves learning new things. *Mum is learning Greek in the evenings* and she also studies history.'
A3	[+F-f]	'My colleague said they heard my dad was learning Greek in the evenings but I told him no. *Mum is learning Greek in the evenings.* Dad sits at home and watches TV.'
A4	[-F-f]	'My mother loves Greek. *Mum is learning Greek in the evenings* and she likes to watch films on Greek history.'
B1	[+F+f]	'My aunt said she heard my dad puts the kids to bed at night for my sister but I told him no. *Mum puts the baby to bed at night.* Dad reads a story to the girls.'
B2	[-F+f]	'My sister is ill at the moment so my mum helps her get the kids to bed at night. *Mum puts the baby to bed at night* and reads him a story.'
B3	[+F-f]	'My aunt said she heard my dad puts the baby to bed at night for my sister but I told him no. *Mum puts the baby to bed at night.* Dad reads him a story.'
B4	[-F-f]	'My sister is ill at the moment so my mum is helping her with the baby at night. *Mum puts the baby to bed at night* and reads him a story.'

[12] A reviewer points out that in all +F cases the contrasting referent ('Dad') is mentioned both before and after the trigger word, and thus that the origin of the contrast cannot be uniquely determined in the current dataset.

The full dataset of 8 'SVO' paragraphs (2 lexical sets x 4 focus contexts) were interspersed with filler paragraphs and pseudo-randomised; no two paragraphs from the same lexical set appeared on the same page. After reading a set of paragraphs speakers performed an unrelated task to break up the recording session and facilitate interpretation of each paragraph from its own internal structure, rather than in comparison with paragraphs in other sets.
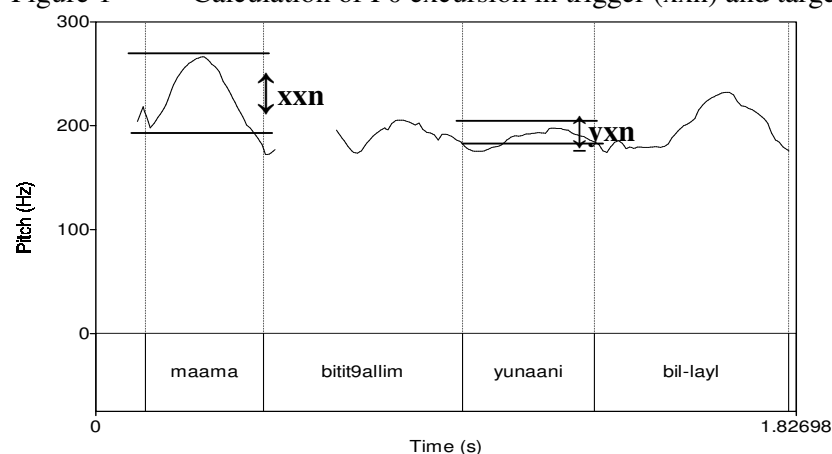
Each paragraph was read 3 times by 6 speakers of EA, yielding 18 x 8 = 144 tokens for analysis. Digital recordings were made using ProTools 6.0 on MBox at 44.1 KHz 16 bit, resampled to 22.05 KHz 16 bit for analysis. Two investigations were carried out on the resulting recordings with reference to F0 and spectrogram using Praat 4.2 (Boersma & Weenink 2004):

i) qualitative analysis (categorical presence/absence of pitch accents on targets), and
ii) quantitative analysis (gradient variation in F0 excursion in triggers and/or targets).

The criterion used during categorical analysis was whether or not a local F0 maximum occurred on or near the stressed syllable of each target word (and thus whether or not target words were ever 'de-accented').[13] Absence of an F0 maximum on or near the stressed syllable of a target would be interpreted as an instance of de-accenting. Since Norlin (1989) did not observe focus related de-accenting no categorical effects were anticipated in the present study.

The gradient analysis used F0 excursion as the dependent variable to determine whether there are gradient effects of focus on F0 in both target and trigger words. The position of the minimum (L) and maximum (H) F0 turning points associated with the stressed syllable of the trigger and target words in each token was labelled by hand (using the automatic pitch minima/maxima function within Praat 4.2 as a guide). The F0 value at each of these four points was extracted in semitones and F0 excursion calculated within each word: 'xn' = F0max- F0min (illustrated schematically in Figure 1 below). The expectation is that F0 excursion will vary between focussed and non-focussed words as a result of pitch range manipulation, as observed by Norlin (1989).

Figure 1   Calculation of F0 excursion in trigger (xxn) and target (yxn) words..

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[13] The target word in each token was labelled by hand as an interval using Praat 4.2 and the automatic pitch maximum identification function was used as a guide in deciding whether a local F0 maximum occurs on or near to the stressed syllable of a target word. When this method is used on unaccented function words the local maximum is usually identified as being at the start of the word, because pitch simply falls steadily throughout the word, rather than word-medially or word-finally (that is, on or near the stressed syllable).

If pitch range manipulation in EA reflects the presence of a contrastive focus then we expect expansion of pitch range on focussed items (F0 excursion in trigger words ('xxn') will be greater in +F contexts than in -F contexts) and pitch range compression on post-focal items (F0 excursion in target words 'yxn' will be smaller in +F contexts than in -F contexts). If, instead, pitch range manipulation in EA reflects given/new information focus status, we expect expansion of pitch range on new items as compared with given items and thus F0 excursion in target words ('yxn') will be greater in +f contexts than in -f contexts.[14] If pitch range manipulation reflects *both* types of focus to some extent, then the resulting F0 excursion properties are harder to predict, but may reveal in what ways the two types of focus are marked.

3.2   Results
3.2.1   Results of categorical analysis (presence or absence of pitch accents)
Categorical analysis of target words in the dataset reveals that in all 144 tokens there is a local F0 maximum on or near the target word, which is taken to be a pitch accent associated with the word. There is thus no categorical de-accenting of target words in the EA data, regardless of the given/new information focus status of the target or the contrastive focus status of the trigger.

Four typical pitch tracks from one speaker are illustrated in Figure 2 below, showing target words with new information status in [+F+f] and [-F+f], and targets with given information status in [+F-f] and [-F-f]. In Figure 2c, illustrating a given target following a contrastive focus, it is visually clear that there is a pitch movement on the target word [yunaani] 'Greek', but it is also clear that the degree of F0 excursion varies in the different words, suggesting that gradient manipulation of pitch range is likely to be relevant in EA.

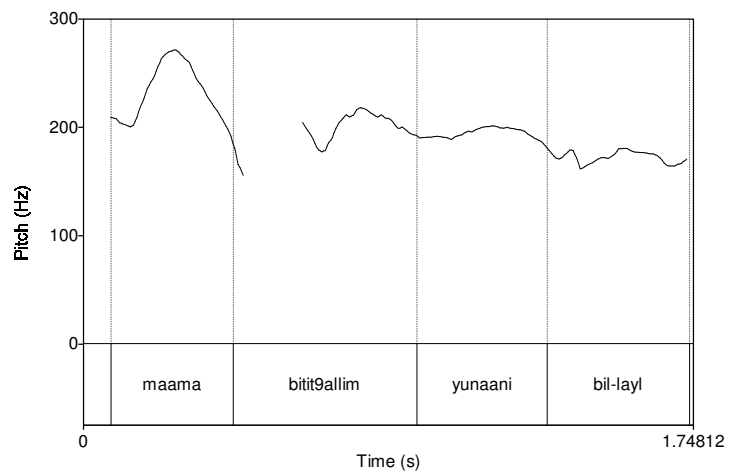### 3.2.2   Results of gradient analysis (F0 excursion)
Looking first at F0 excursion in trigger words (xxn), this can only be expected to vary with contrastive focus status (since all context paragraphs elicited trigger words as new in context). To reproduce Norlin's (1989) result, F0 excursion in trigger words (xxn) should be greater in +F contexts than -F contexts.

Figure 3 displays mean values of xxn by individual focus condition and by speaker. The patterns of F0 excursion produced by female speakers pattern as expected, with greater mean F0 excursion in +F than -F contexts, whilst the male speakers exhibit considerably more variation;[15] this variation among speakers leads to a non-significant result when mean values of xxn in +F vs -F condition are compared across all speakers (Tamhane's test N.S). Analysis of female speakers' data only (oneway ANOVA, xxn by focus condition), shows that the differences in mean values of F0 excursion in trigger words among female speakers are significant (p<0.001), and a post-hoc test (Tukey HSD) shows that the distinctions reflect contrastive focus status ([+F+f] vs.[-F+f]: p=0.046; [+F-f] vs. [-F-f]: p=0.025; $\alpha = 0.05$).
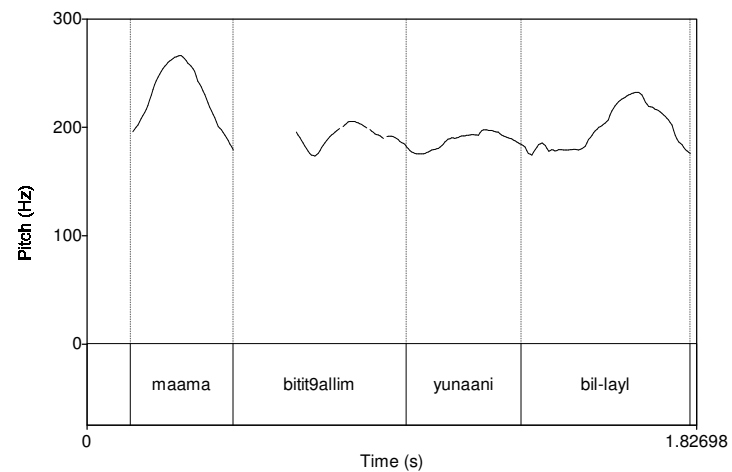
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[14] There will be no effect of given/new information focus status on trigger words, since all are new in context.
[15] Speaker *mns* patterns as expected in [+F+f] vs [-F+f], but unexpectedly increases F0 excursion in the (-F) trigger word in [-F-f] condition; in contrast speaker *meh* patterns as expected though to a lesser degree in [+F-f] vs. [-F-f], but unexpectedly increases F0 excursion in the -F trigger word in [-F+f] condition. The remaining male speaker (*miz*) has consistently higher F0 excursion in -F triggers than in +F triggers.
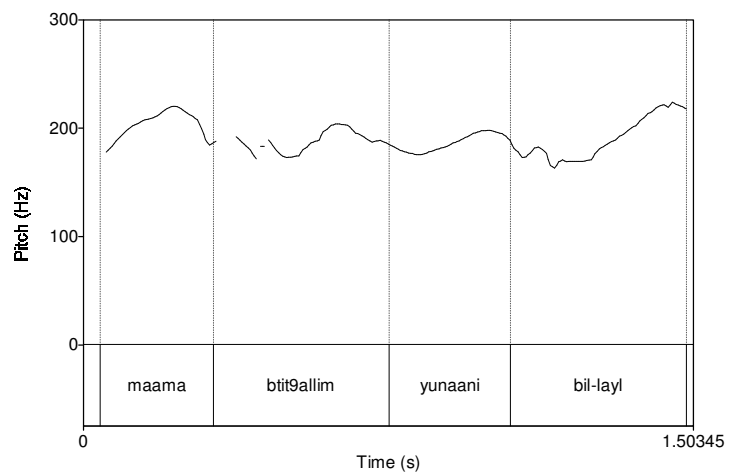
Figure 2   Sample pitch tracks of:
a) +F+f condition (*121faa1*).

c) +F-f condition (*123faa1*).

b) -F+f condition (*122faa1*).
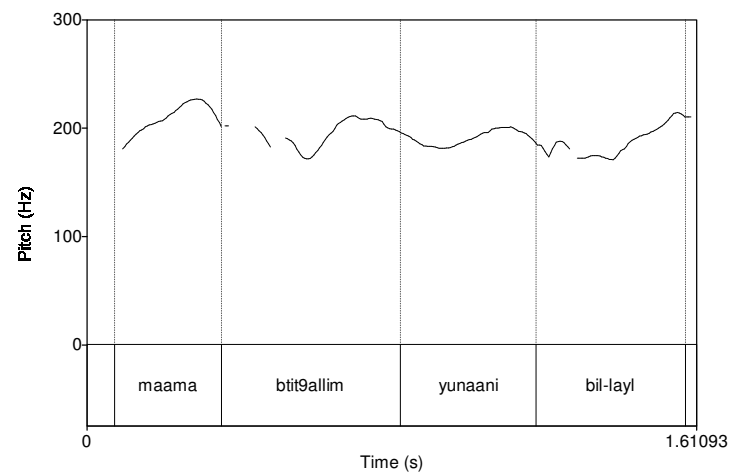
d) -F-f condition (*123faa1*).

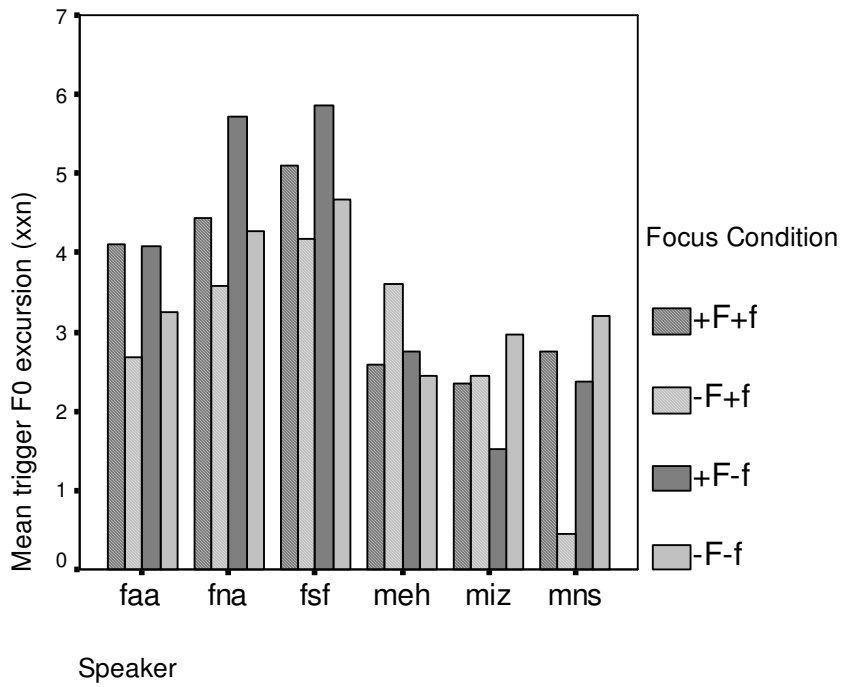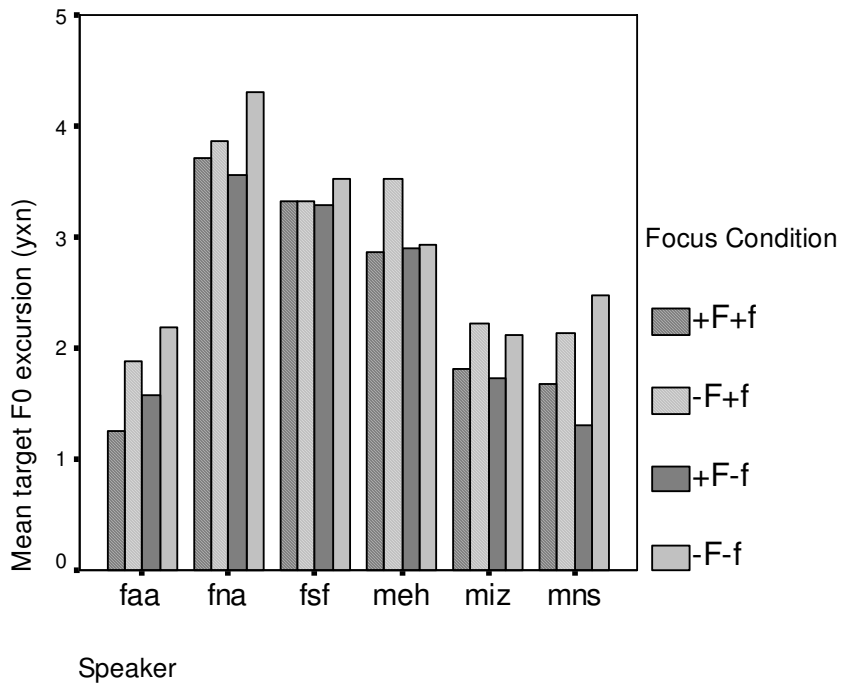Figure 3   Mean trigger F0 excursion (xxn) by focus condition & by speaker.

Figure 4   Mean target F0 excursion (yxn) by focus condition & by speaker.
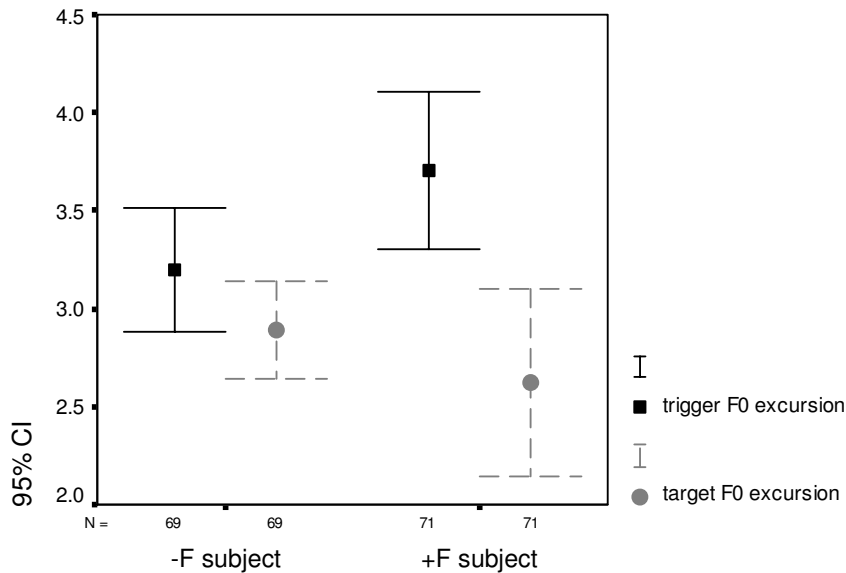
Turning to F0 excursion in target words (*yxn*), this could be expected to vary either according to whether or not the target word follows a contrastive focus, or according to the given/new information focus status of the target itself (or to reflect both types of focus in some way). If the post-focal F0 compression effects reported in Norlin (1989) are due to the fact of an item falling *after* a contrastive focus, then F0 excursion in target words (yxn) will be *smaller* in +F conditions than in -F conditions. If, however, post-focal F0 compression effects in fact reflect the given/new information focus status of target words themselves then yxn will be *greater* in +f conditions than in -f conditions.

Figure 4 above shows mean values of target F0 excursion (yxn) by focus condition and by speaker. These data show more homogeneity in the general trend across all speakers than seen in trigger word F0 excursion, and the trend observed is in the direction expected if F0 compression marks the post-contrastive focus status of the target, rather than the information focus status of the target itself: mean target F0 excursion is generally smaller in +F conditions (indicating F0 compression in targets) than in parallel -F conditions. A oneway ANOVA (yxn by focus condition) comparing differences in mean value of target F0 excursion indicates a marginal effect between focus conditions (p=0.073). A more revealing test is a two-way comparison of mean differences in F0 target excursion across each *type* of focus condition.[16] A pair of oneway ANOVAs (yxn by ±*F* status and yxn by ±*f* status) reveals that the difference target F0 excursion between grouped +F vs. -F conditions is significant (p=0.009), compared to a non-significant difference between mean values of target F0 excursion in grouped +f vs.-f conditions (p=0.898).

In summary then, examination of F0 excursion in trigger and target words suggests quite strongly that in EA manipulation of pitch range is a reflex not of given/new information focus status but of contrastive focus, and that this is manifested both as expansion of pitch range on items bearing contrastive focus (here, trigger words) and as compression of items which follow the contrastive focus (here, target words). The results are summarised in Figure 5 below, which shows 95% confidence intervals around mean values of F0 excursion in trigger words (xxn, in the subject of the sentence, indicated with a solid line) and target words (yxn, in the object of the sentence, indicated with a dashed line), grouped by presence vs. absence of a contrastive focus in the sentence. F0 excursion in trigger words is larger when they bear contrastive focus (+F) than when they don't (-F), and F0 excursion in target words is smaller when they follow a contrastive focus (+F) than when they don't (-F).

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[16] [+F+f] and [+F-f] values are grouped together as a '+F' set, for comparison with a '-F' set comprising [-F+f] and [-F-f] values; to assess information focus status effects [+F+f] and [-F+f] values are grouped as a '+f' set, for comparison with a '-f' set comprising [+F-f] and [-F-f] values.

Figure 5   95% confidence intervals around mean values of F0 excursion (xxn and yxn) in semitones, grouped by contrastive focus status of the subject.

3.2.3   Summary of results

The results of the experimental investigation of the prosodic reflexes of contrastive focus and information focus status in EA show that there is no categorical 'de-accenting' of words in any context, even if the target word is given in context (-f) and occurs after a contrastive focus (positioned after a +F trigger word). This latter context is thought to be the most conducive to de-accenting of words in Germanic languages such as English (cf. Selkirk 2000), and yet does not condition de-accenting in EA.

As for gradient reflexes, the results indicate that pitch range manipulation is used in EA to enhance the contrast between a contrastively focussed item, on which pitch range is expanded, and following items, on which pitch range is compressed. These findings match those of Norlin (1989) and serve also to disambiguate which type of focus must have been at issue in the earlier study, namely a contrastive or exhaustive focus.

There appear to be neither categorical nor gradient prosodic reflexes of given/new information focus status in EA, which suggests that EA should be characterised as a non-de-accenting language, in the typology discussed in section 2.1. This classification is discussed in detail in section 4 below.

3.3   Interim discussion: the prosodic reflexes of *contrastive focus* in EA

The experimental results indicate that gradient pitch range manipulation is used in EA to mark items which bear contrastive focus, and similar effects have been observed in other languages. Ladd (1994) proposes a categorical analysis of similar effects in English (as either a [raised peak] feature or a separate 'H^{+}' pitch accent) to reflect the fact that in these cases pitch range manipulation generates a consistent linguistically distinct interpretation. Hayes (1994) argues however that emphasis can be expressed on a word bearing any tonal event (not just a high peak): whatever the tonal specification of the word, under focus its properties

are enhanced, with the proviso that phonologically relevant distinctions are preserved. Hayes characterises this effect as linguistic but gradient and terms it 'gestural reinforcement'.

Hayes' (1994) proposal is similar to the notion of 'hyperarticulation' of focussed items adopted by Chahal (2001) for LA (see section 2.3). De Jong and Zawaydeh (2002) have similarly argued for a non-categorical analysis of focus effects in a study on vowel duration and F1 values in Jordanian Arabic (JA). Whilst word-stress effects were comparable across all speakers, constituent focus effects varied across speakers; they suggest this indicates focus effects are not fully conventionalised but only implemented when needed: "speakers are aware.. of how particular contrasts are expressed and can enhance them specifically in a way which might not be what other speakers do" (de Jong & Zawaydeh 2002:72).

Analysis of gradient pitch range manipulation effects as non-conventionalised 'gestural reinforcement' seems to be plausible for EA then, by analogy with these other results, and on the basis of the results reported above. Additional evidence to support this characterization of contrastive focus effects in EA comes from two sources.

Firstly, in a separate study on the dataset presented here, of the alignment of pitch peaks (Hellmuth 2006a), significant effects on peak alignment were observed only on target words *following* a contrastive focus, whereas alignment in contrastively focussed words themselves was unaffected. This is consistent with Hayes' notion of 'gestural reinforcement': the phonologically relevant alignment properties of contrastively focussed items are preserved, whilst those of post-focal items are less accurately conveyed.

Secondly, Mughazy (2003) has described salient but *optional* use of 'contrastive intonation'. The distinction between truth-functional negation and metalinguistic negation is syntactically unambiguous in EA,[17] and in addition in metalinguistic contexts the continuous negative particle is usually prosodically prominent. Nonetheless Mughazy notes that speakers can create ambiguity for ironic effect in by *failing* to implement the contrastive intonation pattern. The fact that speakers can use or not use contrastive intonation in this way suggests that contrastive-focus-related F0 expansion in EA is not categorical or fully conventionalized, but instead gradient and under the pragmatic control of EA speakers.

4   Discussion
4.1   Classification of EA as a non-de-accenting language.
The facts of EA suggest that it should be grouped with the 'Romance-type' languages, since it resists de-accenting of textually-given items. There is also support for classification of EA as a 'non-de-accenting' language from data collected in less controlled contexts. In a small study of the interaction between focus structure and pitch accent distribution in EA, Hellmuth (2005) elicited short semi-spontaneous scripted phrase-sized utterances produced during a card game, with cards manipulated so that items were either new, contrasted, or given.[18] Among 36 tokens containing given targets, either before or after a contrast, there was only a single instance of de-accenting.

Similarly, Hellmuth (2006b) reports on pitch accent distribution in recordings of a colloquial narrative folk story read and then retold from memory[19]. The story involves bargaining over

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[17] Use of the continuous form [miš] of the (usually discontinuous) negation marker [ma- -š] indicates that a metalinguistic negation interpretation is intended.
[18] Following the methodology of Swerts et al. (2002).
[19] The folk tale was taken from Abdel Massih (1975) was presented in Egyptian Arabic orthography.

prices and thus much repetition of phrases involving the unit of currency [saaG] 'piastre'[20], along the lines of 'you said six piastres, not three piastres'. In a Germanic language the tendency would be to omit the repeated currency unit completely ('you said six piastres not three'), or if the word is overt to de-accent it. In the read narratives, since speakers were reading from a script, the currency unit was always overt and was accented by all speakers. In the retold versions of the narratives, which speakers were asked to produce from memory, there was variation with some speakers omitting the currency unit and some pronouncing it; again, where overt the word [saaG] was invariably accented. Pitch tracks of two sample sentences (read and retold) are provided in Figures 6-7 below.[21]

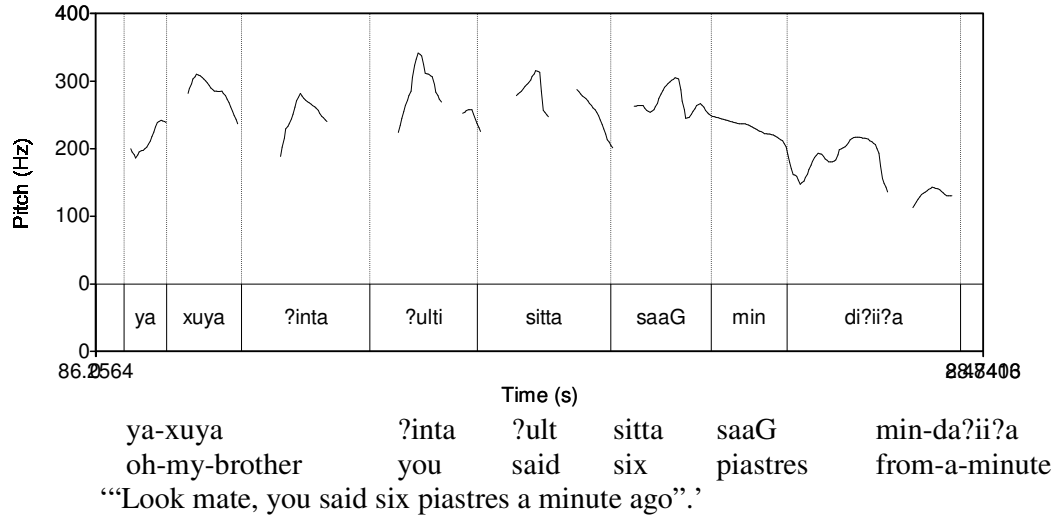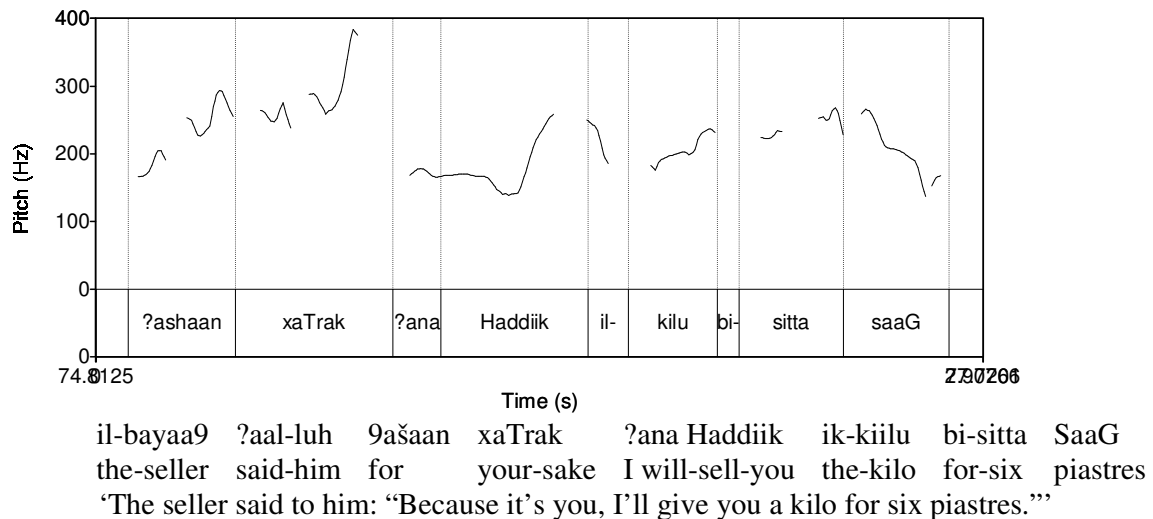Figure 6   Accenting of repeated [saaG] in a read rendition of sentence C (*fsf2*).

| ya | xuya | ?inta | ?ulti | sitta | saaG | min | di?ii?a |

ya-xuya	?inta	?ult	sitta	saaG	min-da?ii?a
oh-my-brother	you	said	six	piastres	from-a-minute

'"Look mate, you said six piastres a minute ago".'

Figure 7   Accenting of repeated [saaG] in a retold rendition of sentence C (*fsf4*).

| ?ashaan | xaTrak | ?ana | Haddiik | il- | kilu | bi- | sitta | saaG |

il-bayaa9	?aal-luh	9ašaan	xaTrak	?ana Haddiik	ik-kiilu	bi-sitta	SaaG
the-seller	said-him	for	your-sake	I will-sell-you	the-kilo	for-six	piastres

'The seller said to him: "Because it's you, I'll give you a kilo for six piastres."'

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[20] There are one hundred piastres ([saaG] or [?irš]) in one Egyptian pound ([gineeh]).
[21] Compare also the findings of El Zarka (this volume): "il-9arabiyya BAYZA 9ašaan il-faraamil BAYZA" (The car is broken because the brakes are broken).

4.2   The apparent lack of prosodic reflexes of the given/new distinction in EA
The claim of this paper so far is that there is no prosodic reflex of given/new information status in EA and that this places EA typologically alongside Italian and other Romance languages (Ladd 1996, Swerts et al 2002). It has been noted, however, that there are *non-prosodic* reflexes of given/new information status available in the Romance languages, typically involved changes in word order. Ladd (1996:179) cites the Italian example in (11) in which a given item moves to a sentence-final 'tag' position where it is produced in a low pitch range, which he suggests is a plausible functional equivalent of de-accenting. The English parallel would be (11b), but the equivalent in Italian, in which "bagnetto" is de-accented, is less acceptable (Ladd 1996:179; capitals indicate contrastive focus).[22]

(11)   Right-dislocation of given item in Italian

      a.   Adesso   faccio   scorrere   il   TUO,   di   bagnetto.
                    now   I make   run   the   yours,   of   bath.dim

      b.   "Now I'll run YOUR bath"

      c.   ??Adesso faccio scorrere il TUO bagnetto.

The question arises whether EA similarly has non-prosodic strategies for expressing information status, and indeed a syntactic strategy has been reported for marking the given/new distinction in EA.

Jelinek (2002) argues that expression of given/new information status distinction is partly grammaticalised in EA. She identifies two syntactic strategies available to express given/new status (which she terms 'backgrounding of arguments'): the option to have a null subject ('pro-drop') and the option to incorporate an object pronoun into the verb ('object cliticisation').[23] In EA definite subjects can be 'pro-dropped' and are in this way "maximally backgrounded in the discourse" (Jelinek 2002:71); likewise object clitics are argued to have a similarly backgrounded status.

Jelinek notes that an overt subject pronoun in EA always introduces a discourse element which is "new or contrastive in the context" (bearing either information or contrastive constituent focus, in the terms used here), and usually receives "added stress or a higher intonation peak"; a 'dropped' subject is always "old information that is topical and maximally backgrounded" (Jelinek 2002:94). In (12a), the pronoun [hiyya] 'she' is optional; in (12b) the pronoun is obligatory (Jelinek 2002:94; 'higher intonation' indicated in capitals).

(12)   a.   (hiyya)   waSalit
               (she)   arrive-perf.3fs
               'She arrived.'

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[22] This is de-accenting of a given item in post-contrastive-focus position, and it could be the need to assign main prominence to the +*F* item "tuo" (your) which conditions right-dislocation, rather than the need to express the given status of "bagnetto" (bath). Vallduví (1991) describes languages where the position of accents in a phrase is fixed as 'non-plastic', in which changes to word order are used to shift constituents into locations where they will appear with or without accent as needed. This Italian example could be analysed as movement of "tuo" to phrase-final position where it receives main prominence (c.f. Zubizaretta 1998, Frascarelli 2000).

[23] Jelinek uses this description, but other authors argue that object pronouns in Arabic are not in fact clitics but are fully incorporated into the verbal complex (Shlonsky 1997).

	b.	HIYYA	waSalit	muš	huwwa
		she	arrive-perf.3fs	not	he

'It was SHE who arrived, not he.'[24]

The availability of a syntactic strategy for expressing given/new information status in EA could explain the absence of a prosodic reflex of this status, under the view that there is functional complementarity among information structure strategies. Engdahl & Vallduvi (1994) and Van Valin (1999) independently argue for information structure specific constraints, to explain why different languages employ strategies from different areas of grammar (syntax, phonology or morphology) to express a single information structure category. Under this type of argument, we might hypothesise that EA has no prosodic strategy to express given/new information status *because* it has a syntactic strategy available to express the same notion (a given subject is dropped and a given object cliticised). A less complex explanation straightforwardly ascribes the lack of prosodic reflexes of given/new status in EA to some property of EA phonology.[25] This latter argument would match the claim made in Hellmuth (2006), on the basis of the rich distribution of intonational pitch accents in EA, that there is a purely phonological constraint requiring every Prosodic Word in EA to bear a pitch accent. The remainder of this section sets out preliminary arguments in favour of a phonological explanation for the lack of a prosodic reflex of given/new information status in EA.

One argument comes from examination of subjects which are given in context but which are not 'dropped' due to grammatical restrictions (the subject of a nominal sentence cannot be dropped in EA, Jelinek 2002:72). If there is a link between the lack of de-accenting in EA and the availability of a syntactic strategy, then we might expect the subject of a nominal sentence that is given in context to be de-accented. However Hellmuth (2006) reports a case where a repeated, and thus given, subject of a nominal sentence is accented, suggesting that even when a word is obligatorily overt, yet given, it is accented in EA. Quantitative experimental investigation is needed to test whether gradient prosodic reflexes of given/new status emerge in EA in contexts where syntactic backgrounding of arguments is not possible.

A more general argument suggests that a purely complementary approach to information structure is perhaps too simplistic. Although all English dialects share the property of not allowing subject drop, this is not in itself a reliable predictor of availability or otherwise of de-accenting. Whilst 'standard' British and American English routinely de-accent given items as discussed in section 2.1 above, other dialects of English do not allow de-accenting (Cruttenden 2006):

(14)   a.   A: You just weren't LISTENING.   *Indian English*
           B: I was LISTENING.

      b.   I went to the shop to buy SWEETS,   *Singapore English*
           but they had totally run out of SWEETS.

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[24] Jelinek translates this with a cleft in English, although there is no cleft or pseudocleft construction in the EA.
[25] A solution of this kind this does not reject the notion of functional complementarity entirely, but reverses the direction of the causal relationship inferred to hold between availability of syntactic and prosodic strategies. Rather than saying EA has no prosodic reflex of information status *because* it has an available syntactic reflex, instead one could say that EA employs a syntactic strategy in this information structure context because no alternative prosodic strategy is available (for grammatical reasons particular to the phonology of EA).

Potentially conclusive evidence could therefore come from investigation of the prosodic reflexes of given/new information status in other spoken Arabic dialects. Since all Arabic dialects share the property of allowing null subjects and object cliticisation, a functional complementarity argument would predict there to be no need for a prosodic reflex of given/new status in any Arabic dialect. In the data available to date however, this prediction is not borne out, since as noted already Chahal (2001) reports complete de-accenting of post-focal given items in LA (although her study did not investigate information focus and contrastive focus separately).

Finally, the apparent lack of a prosodic reflex of given/new information status in EA is argued here on the basis of examination of only one potential phonetic correlate of givenness, namely F0 effects. Even if the phonology of EA prohibits realisation of a Prosodic Word without a pitch accent, it is possible that givenness could be expressed by means of reduction of other word-prominence phonetic correlates such as intensity, vowel quality or duration. Intensity as a reflex of focus has been observed in the related Afro-Asiatic language Beja (p.c. Martine Vanhove) and an investigation of intensity in the present dataset is thus envisaged.[26]

In summary then, we propose that the lack of any F0 reflex of given/new information status in EA most probably arises due to properties in the phonology of EA (the requirement that every Prosodic Word bear a pitch accent). Where grammatical conditions apply and discourse conditions allow,[27] given information status can be expressed by alternative grammatical means (subject drop or object cliticisation). Identification of additional possible grammatical expressions of given/new information status in EA would be a potentially revealing topic for future research.

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[26] The possibility of alternate prosodic correlates as reflexes of givenness in EA is also suggested by El Zarka (this volume).

[27] Cf. Eid (1983).

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