
SEGMENTATIVE FUNCTION OF PROSODY IN DISCOURSE

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Abstract

The central focus of this article is to present a description of the prosodic features manifested in Malay spoken discourse and the segmentative function they perform in their loci of occurrences. To attain this goal, the study relies on a detailed analysis of transcribed recordings of selected fragments of Malay broadcast interviews. By adopting a descriptive framework that recognises prosody as consisting of prosodic resources such as pitch, loudness, tempo and pause, I am able to present a formal characterisation of prosodic realisations in Malay spoken discourse. And by examining these prosodic cues in a segmentational system in the context of adjacency pairs, I am able to account for the relationship between prosodic manifestations and the segmentative function they fulfill in actual interaction. The article presents argument for segmenting discourse into units of speech whose boundaries are defined by audible phonetic cues. The conclusion is that this less restrictive framework enables the identification of the prosodic cues involved in segmentative work and the roles that the segmented chunks play in discourse development.

Prosodic resources for segmentation

The title of this article reflects an assumption that spoken discourse has some kind of internal structure and that prosody is involved in its structuring. The purpose of this study is to examine the issues of segmentation in continuous discourse and the prosodic resources available for segmentation. In order to describe how prosody is exploited as a cue to segmentation it is necessary to define what prosody is.

The first issue to be addressed here is the implication of the use of the term prosody instead of intonation in the title of this article. Some linguists view intonation as a synonym of prosody in general, while others restrict the use of the term intonation to linguistically functional pitch events only. The overlaps of the term make the dividing line between intonation and prosody unclear, and this is commented upon by Crystal as follows.

scholars in the field have been anxious to restrict the formal definition of intonation to pitch movement alone (although occasionally allowing in stress variation as well). (Crystal, 1969:195)

In his definition of intonation, Crystal (1969) includes not only the phenomenon of tone but also the prosodic features like pitch range, tempo, loudness and pause. This is somewhat similar to the definition of Boves, Tenhave and Vieregge (1984) who regard intonation as consisting of various prosodic features such as pitch, loudness and temporal organisation. This broad definition of intonation has resulted in a considerable overlap between intonation and prosody, with intonation being a realisation of several prosodic features, all of which co-occur simultaneously with segmental information on continually varying parameters.

Rather than adopting the term intonation, the article employs the term prosody which is taken to include not only pitch (which is the principal correlate of intonation) but also other prosodic features like tempo, loudness and pause which may be used for linguistic purposes individually or in combination. Couper Kuhlen (1986) equates prosody with a definition of intonation in its broadest sense. The use of the term prosody is considered to be more appropriate to our focus since the study does not only take into account pitch phenomena which strictly belong to prosody but also other prosodic resources such as tempo, loudness and pause.

Two assumptions must be stated as underlying the present approach. First, in examining a stretch of speech one can distinguish between aspects of phonetic continuum which affect the identification of particular words, and other phonetic aspects which are essentially variable in relation to them (Crystal, 1969). A given syllable, word or phrase may be uttered in a number of ways by varying its prosodic characteristics. In Malay, one can contrast the varia-

tions that can occur in respect of these prosodic features in uttering "bapa" (father) which are non-word identifying with the segmental features (bilabial voice plosion and bilabial voiceless plosion, for example) which are word identifying. Second, in describing the prosodic features of a given syllable, a basic distinction can be made between their relative norms and absolute values. Couper-Kuhlen (1986) argues that although the argument for prosodic relativity has come primarily from the area of intonation, the same point can also be made concerning other prosodic features.

In the context of utterance, the term prosody subsumes at least the following auditory aspects of speech. loudness, tempo, pitch and pause. In order to exhibit the range and gradation of linguistic contrastivity present in each of these prosodic features, they are grouped into systems on the basis of shared dominant phonetic parameters. Each system covers particular kind of variability that can be discussed independently of variations taking place elsewhere (Crystal, 1969). Although prosodic features may extend over longer stretches of speech, the smallest possible domain over which they extend is the syllable. Thus, in describing the prosody of a stretch of speech the concern is not with the pitch of a segment but the duration of a syllable, not the loudness of segments, but the loudness of syllables (Zuraidah Mohd Don, 1996).

Segmentation and continuous speech

The prosodic cues which contribute to the realisation of segmented chunks may bound a unit containing a prominent lexical item whose realisation as such is brought about by the presence of a single most prominent point commonly referred to as the nucleus. The lexical item containing the nucleus is indicated in the data by capitalisation. At times due to planning or production problems, the speaker pauses or changes the tempo of his speech by decelerating or prolonging a syllable before reaching the most prominent point, thereby resulting in intonationally incomplete speech units. In spite of this, the break in the prosodic flow is important pragmatically as it allows the speaker time to find the word he wants or to marshal the information he wishes to present.

Prosodically bound units, which are the consequence of non-fluent speech (e.g. slips of the tongue, abandoned chunks, false starts, incomplete syntactic constructions), are usually intonationally insignificant in the sense that they lack a nucleus. Often the boundaries between speech units do not neatly coincide with the boundaries between syntactic constituents. In natural spoken discourse, speakers group together what they feel needs to be grouped together for the purpose of the moment, a purpose which is constrained in part by language and in part by context.

Methodology

The genre examined below comes from a two-party broadcast interview where only two participants are involved, the interviewer and the interviewee. The choice is deemed appropriate for an investigation of this nature because broadcast interviews fulfil the requirement of what is referred to as discourse. Such a choice is also based on the belief that the examination of prosody in discourse should begin with a less complex interaction, with a type of spoken discourse which has much more overt structure where participants have specified roles and where one participant has acknowledged responsibility for selecting the next speaker and initiating and ending topics.

The segmentative function of prosody will be examined within the context of question and answer sequences. The purpose of analysing authentic data is to discover how the speaker segments a stretch of speech into prosodically demarcated portions while at the same time indicate that they belong together. The present study attempts to go beyond the traditional framework by not restricting the description to individual segmented units. The examination of the segmented parts presupposes a considerable length of stretches of speech larger than the segmented units themselves. Such an examination necessitates one to regard the sequences of speech segments as a *gestalt*, i.e. as an organised whole which is made up of segmented portions whose boundaries are audibly marked by prosodic cues. Although the examination shall proceed by identifying individual segmented parts and the prosodic features involved in such realisations, the identified segments will not be considered as isolated segments but as part of a whole. This will enable us to understand not only the reasons why that particular stretch of speech is segmented but also more importantly what each segmented part plays in discourse development.

Segmentation into divisible units will be done auditorily at first, and will be presented using the notational conventions set up in the Appendix. The pitch contour was captured by an instrumental analysis using Mac Speech Lab II for the purpose of determining the end pitch of the prior segmented portion and the beginning pitch of the subsequent one. Listening to the data auditorily is important as it enables the analyst to hear where the break in the prosodic flow of an utterance occurs, particularly when the break is brought about by a change in tempo. Van Leeuwen (1992, 236) who supports the use of auditory analysis states that the analysis of a prosodic break (which he calls *juncture*) "based as it is on perceptual subjective phenomenon, needs to be auditory". The duration of the segmented parts, pauses and length of the final syllable in the selected speech units were measured using Mac Speech Lab II.

The selected fragments for analysis are presented textually in terms of prosodic-oriented transcription which is essentially an orthographic transcrip-

tion of selected data. After transcribing the data orthographically, the prosodic information was then added to the transcription (see the transcription conventions in the appendix). A phonetic transcription was avoided. The transcription generally follows the conventions established in the Conversational Analysis literature (see for example, Schegloff, 1982). Recognisable "words" uttered were transcribed using the conventional spelling of the items, regardless of the pronunciation. A certain degree of liberty was taken in transcribing certain brief responses in the data which are in the form of noises such as *mhm*, *oh*, *ah* and *eh*. In the analytic comments, prosodic information is indicated only as far as it is relevant for the argument being developed.

Analysis of data

The portions of discourse selected for examination are adjacency pairs of question-answer type. Adjacency pairs allow the examination of how the speaker segments speech within a turn as well as across turn boundaries. This will enable the researcher to examine the hearer's response particularly with regard to the presentation of his answer, i.e. whether it is presented as an uninterrupted stretch of speech or as being made up of prosodically identifiable chunks. Let us now examine *Extract 1* in this regard.

Extract 1 is a good example of fluent speech. The absence of hesitation could be attributed to the kind of topic talked about (i.e. road condition) and the type of question asked, i.e. a tag question which requires a brief answer. Each segmented chunk corresponds with a syntactic constituent, and its boundary is demarcated by prosodic cues such as a pitch shift, or a pause or both or a latched response from the co-participant. The development of topic moves from talking about the road condition which is not congested to the reason why the road is clear.

Segments 1A1 and 1A2 are parts of a tag question: *Jalan tak jem* ("The road is not congested") is the stem, and *ya doktor* ("yes doctor") is the tag. In writing, the tag and the stem are separated by a comma: *Jalan tak jem, ya doktor*. Although in this instance, the speaker does not separate the main statement from its tag by a pause, which is the usual case, he indicates separation by a pitch change. The statement *jalan tak jem* is marked by a pitch obstruction, i.e. a low fall on *jem*, and this followed by a step up in pitch in the production of *ya*, the initial syllable of the tag. The presence of these pitch characteristics made the speech units hearable as separate chunks. This is clearly reflected in the pitch contour display of *jalan tak jem* whereby *ya* is uttered at about 120

Extract 1

1A1	a: jalan tak `JEM <H H> < > CRES <>(0.73) < >(0.48)	1A1 The road is not congested A2 yes doctor
A2	# ya `DOKTOR <H><L H> < >(0.42)	2B1 This morning it looks B2 good 3A1 Good eh today?
2B1	(0.32) a: # `NAMPAK pagi ni: <H>< f > <L> (0.60)< > < >(0.54)	4B1 Probably because today is Saturday 5A1 Saturday
B2	# BAGUS= <f f> < >(0.36)	
3A1	= BAGUS eh hari ni < H > < f > < DEC > < >(0.91)	
4B1	# MUNGKIN kerana hari `SABTU= < >f <DEC > (0.79)< >	
5A1	=hari `SABTU < >L < f > < >(0.61) <>(0.2)	

Hz while the end pitch of *jam* is at about 80 Hz, i.e. a jump of about 40 Hz. After uttering *ya* the speaker produces an address form *doktor* which is uttered relatively high in his pitch range. The end pitch rises slightly to contextualise the utterance as a request for confirmation.

B's delayed response (see 2B1) contextualised as so by an initial pause of 320 msec and a filler of 600 msec gives the impression that the speaker is planning ahead his answer to the question. Thus when *nampak pagi ni* is produced, it is presented as one segment without any prosodic break, and the end is marked by a level pitch on *ni* (this), a reference word referring to *pagi* (morning). The change in pitch direction on *bagus* (good), A's comment about the road condition, makes it hearable as a separate chunk. The transition from a relatively low endpitch to a step up on *Bagus* is a cue to a break. Thus, even

in the absence of a pause, the break is fairly well cued by intonation to help demarcate the two as prosodically different segments. *Bagus* (see 2B2) uttered with a falling tone is bounded by A's latched question *Bagus eh hari ni* ("A good day today, eh") which seeks confirmation about the information produced in the prior talk.

The tag question (see 3A1) prompts B to supply the possible reason for the clear road. B makes his contribution before the completion of A's question. Information-wise *hari ini* ("today") does not contribute any information because B already knows that A is referring to "the road condition today". Prosodically, the decrescendo loudness, relatively fast tempo and low pitch of *hari ini* communicate that A is approaching the end of his utterance and does not want to continue. The overlapping of A's *hari ini* and B's *mungkin kerana hari Sabtu* (Probably because today is Saturday) results in a no clear turn boundary. *Mungkin kerana hari Sabtu* is uttered low with relatively fast tempo, i. e. 790 msec. A's latched response marks the end of the topic with no additional information but merely echoes B's final phrase *hari Sabtu*. This fading away at a lexical level is reflected prosodically by dropping low in the speaker's pitch range and fading away in amplitude.

In contrast to *Extract 1*, *Extract 2* contains a type of speech which presents grave difficulties to the analyst. It is an example of nonfluent speech which is replete with hesitation phenomena such as pauses, fillers, syllable lengthening, the occurrence of which disrupts the organisation of syntax and intonation. The speaker is obviously facing difficulty in producing what he wants to say, and this is reflected in the inappropriate positioning of the pauses which divides close knit syntactic constituents into two. For example in 2B1 below, the speaker pauses after a preposition *di* (in) separating *di* from its noun *Shah Alam*. In 6B1 *dalam* (in) is separated from *sepuluh minit* (ten minutes), its noun. This nonfluent speech has the features of spontaneous speech which, e in 2B1 below the speaker pauses after a preposition *di* (in) separating *di* from its noun *Shah Alam*. In 5B1 *dalam* is separated from *sepuluh minit*, its noun. This nonfluent speech has the features of spontaneous speech which

is normally not free from errors and often contains slips of the tongue
It is also nearly always far from completely continuous, almost invariably containing a variety of hesitation signals, such as pauses, repetitions, and vocalizations of "er", ah:, and uhm"

(Laver, 197: 45)

Let us now examine *Extract 2* in more detail:

Extract 2

<p>1A1 #dokter tinggal `MANA <al al > < >(0.45)</p> <p>2B1 (0.42) saya `TINGGAL di:. < >DC < >creaky < >LL < >(0.43) < >(0.51)</p> <p>B2: #*SHAH ALAM sebenarnya= < >f< DEC > <al al>(0.38) < >(0.34)</p> <p>3A1=ah: tak tak tak tak `SESAK <L L> < >(0.85) <l l>(0.85)</p> <p>A2 di `JALAN eh < >(0.44)</p> <p>4B1 (0.50) ah: BIASANYA. < >creaky <>(0.24) < >(0.45) [</p> <p>5A1 ya `LEBUHRAYA < >L < >creaky</p> <p>5B1 #dala:m < >creaky <L> <l>(0.85)</p> <p>B2 # sepuluh `MINIT je daripada: < F>< DEC > - < >creaky < >(0.28) < >(0.87) <>(0.63)</p> <p>B3 `RUMAH ke pejabatlah= <L L> < >creaky < >(0.71)</p> <p>7A =ya: <f> <L> < >(0.44)</p>	<p>A Where do you live B I live in Shah Alam, actually.</p> <p>A Yes B The road is not usually congested is it? A Highway B It takes only ten minutes from the house to the office A Yes B because the office is in Shah Alam</p>
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8B1	pasa:l	
	< >ral	
	< >(0.29)	
	< >(0.40)	
B2	(0.34) pejabat PU:N	
	< >(0.45)	
B3	di Shah ALAM juga	
	< >DEC	
	< >L	
	< >(0.50)	
	< >al (0.24)	
9A1	(0.19) `YA	
A2	(0.32) `HARI ni:	
	< >(0.50)	

A initiates the discourse by asking a wh question *doktor tinggal mana* ("Where do you live doctor?", marked 1A1) which is intonationally, syntactically and semantically wellformed. It is uttered fast with a duration of 450 msec and presented as one continuous stream of speech. The beginning is appropriately marked by a relatively high pitch (i. e. 180 Hz), and the post-positioned question word *mana* which is the most prominent word is marked by a falling pitch. The fall is followed by a pause of 420 msec which clearly demarcates the end of utterance. Although the utterance is a question, the presence of a wh-word *mana* is a marker of question already marks it as a question, and thus need not be indicated as such by a rising pitch. Being a syntactically marked position for a question word, *mana* is made prosodically prominent by a combination of falling pitch and forte loudness. Although A's question is not a demanding one, B does not reply immediately but pauses for about 420 msec. This prepositioned pause indicates that the speaker is planning ahead the subsequent speech. Despite this, B's answer *Saya tinggal di Shah Alam sebenarnya* ("I live in Shah Alam, actually") is not uttered as a smooth unbroken stream of speech. It is broken up into two separate units. 2B1 and 2B2 by tempo and pitch parameters. The change from *lento* tempo on *di* to a relatively *allegro* tempo on *Shah Alam* are cues to division. Syntactic discontinuity indicated by the separation of *di* from its noun *Shah Alam*, and the pitch characteristic of *di* which neither falls nor rises are clues to a nonfinal break. Pragmatically, a lengthening of non-final syllable between close-knit constituents clearly indicates that the speaker has not yet finished his utterance.

When B breaks the prosodic flow of his utterance by lengthening *di* (see 2B1), it is unlikely that he needs time to think of *Shah Alam* the place where he lives. It is assumed that this is done for rhetorical effect, presumably with the intention of increasing its impact when it is uttered. After the lengthening, B rushes off to produce *Shah Alam* which is produced noticeably faster than *di*, i.e. at a rate of 380 msec. *sebenarnya*, an adverbial which describes how the

speaker views the preceding talk is uttered low with decrescendo loudness to signal the relinquishing of a turn by the current speaker (see 2B2).

Speaker A (see 2A1) takes the floor immediately. His hasty entry (see 2A1) may have contributed to the difficulty which he faces in formulating his question *tak tak tak tak essak di jalan eh* ("No congestion on the road, eh?") The repetition of *tak* ("no") is a surface indication of production difficulties. The utterance is divided into two segmented units by pitch parameters. The first segment ends with a fall on accented *sesak* (congested); the change in pitch direction on *di* demarcates a boundary which separates *sesak* from the latter. *di jalan, eh* ("on the road, eh") has a peak prominence on *lan* which has a high rising tone. The rising terminal of *eh* contextualises it as a request for confirmation. In writing, *di jalan* (a prepositional phrase) belongs with *tak sesak* the adjective that describes the road condition to form the stem of the tag and *eh* the tag is separated from the stem by a comma. However, in this instance *tak tak tak tak sesak* and *dijalan eh* are heard as separate units.

B's answer, which is replete with hesitation phenomena such as pauses and syllable lengthening, is segmented into chunks which defy syntactic cohesion. The utterance (see 4B1) begins with a frequency adverb *biasanya* ("usually") whose marked lengthened end syllable marks it hearable as not belonging with *dalam*. A's interruptive *lebuhraya* ("highway"; marked 5A1) sets it off from the other segments of the utterance. Likewise, a fluctuation in rate also marks division between *dalam* and *sepuluh minit* a group of words which belongs together syntactically and semantically. After the deceleration on *dalam*, B accelerates on *sepuluh* as if he cannot wait to get to the subsequent group of words, i.e. *minit je daripada* (see 6B2), that provides information on how long the journey is. It is likely that the lengthening of *lam* which causes the prosodic break is produced for effect in order to stress the fact that he does not face the problem of congestion. The boundary is also cued by a change in pitch direction in the production of *sepuluh* "ten" (see 6B2). *daripada* (from), the last word in the prior unit is heard as separated from *rumah* because of the noticeably slow tempo of *daripada* whose final syllable is lengthened to 630 msec and accompanied by creakiness. The change in pitch direction on *rumah* ("house") the subsequent word is another reliable cue to separation. Speaker B presents *rumah ke pejabatlah* (see 6B3) as one segment whose boundary is demarcated by a pause of 130 msec following which is A's low pitched *ya* which prompts B to continue.

Subsequent to A's *ya*, B (see 8B1-B3) gives a reason for the assertion he makes in his prior talk whose function as such is lexically marked by a marker of cause and effect, *pasal* (because). The utterance *pasal pejabat pun di Shah Alam juga* is heard as being broken up into three segments: *pasal, pejabat pun* and *di Shah Alam juga* ("because the office is in Shah Alam too") *pasal* is realised as a separate segment by a pause of 340 msec, a fluctuation in tempo

from *lento* on *pasal* to relatively *allegro* on *pejabat* and by virtue of a slight step up in pitch to the beginning of *pejabat*. Auditorily, the break in the prosodic flow is well cued by the marked change in tempo and a pause. The momentary slowing down of pitch on *pasal* gives the speaker time to marshall the information he wants to present. The subsequent quickening rate on *pejabat* makes it heard as belonging with *pun di Shah Alam juga*, which contains the content message and whose boundary is demarcated by a pause of 190 msec. The speaker signals the end of topic by a prosodic fade away which is realised by low pitch and decrescendo loudness on *juga*.

Summary and conclusion

In this paper an attempt has been made to deal with issues pertaining to the actual realisation of prosody in Malay connected discourse and how speakers exploit the available prosodic resources to segment their utterances. I have aimed at a realistic and insightful definition of Malay prosody, i.e. the manifestations of prosodic cues in actual discourse and the segmentative function they perform in their domains of occurrences. The findings show the advantages of examining real data. Many of the observations and findings described here would never have been noticed without the use of a sample of natural spoken Malay. Unlike the analysis of constructed sentences divorced of context, the analysis of connected discourse would not have been possible without an auditory analysis of the material. The observations made auditorily are corroborated by instrumental analysis.

The difficulties encountered when trying to analyse Malay using a definition of the nucleus and its domain which was finely tuned for English have led to the abandonment of dividing stretches of speech into tone groups. The study adopts a less restrictive approach to segmentation, division into segmented parts is based on the presence of prosodic cues which cause a break in the prosodic flow of the utterances (cf Zuraidah Mohd Don, 2003).

The two prosodic cues which have been identified as crucial in marking the boundaries in the flow of speech are pitch and timing. The perception of coherence in timing is influenced by such parameters as tempo fluctuations, final syllable lengthening, anacrustic syllable and pausing between segmented units of speech. The perception of a break or discontinuity in pitch, which contributes to perceived unity among groups of words belonging together, is brought about by a slight change in pitch height and/or direction on an accented syllable. Often, the movement of pitch on an accented syllable is followed by a pause. The presence of these cues is sufficient to cause a prosodic break in the stretches of Malay speech examined and contributes to perceived prosodic coherence among groups of words which belong together as one speech unit.

Prosodic segmentation is a potential correlate of almost any syntactic unit and can be employed by the speaker in accordance with his encoding strategy. The study shows that Malay speakers segment utterances into segmented chunks of various grammatical units, each playing its role in the development of the discourse, however small or insignificant. Utterance chunking or phrasing is dependent on speaker choice such that it is the speaker who determines where to segment by pausing, decelerating and accelerating and changing pitch height at speech and unit boundaries. Whether the speaker is expressing his opinion, making an assertion or comment, or supporting his previous assertion, he is presenting information in chunks to suit his purpose.

One significant finding is the marked fluctuation of speech rate which interrupts the rhythmic flow of talk, and thereby causing the realisations of separate chunks. The deceleration on the last lexical item caused by final syllable lengthening and the acceleration on the section immediately following it identified the former as the end of the previous talk and the latter the beginning. The prolongation of the final syllable may function to mark off the last lexical item as prominent and may serve as exponents of other systems, e.g. hesitation. In Malay, the prosodic break be it by virtue of syllable lengthening, syllable shortening caused by a sequence of anacrustic syllables, a pause or change in tempo is a reliable and sufficient criterion for marking boundaries.

Appendix

Transcription conventions

- [] Square brackets indicate overlapping talk; the left hand bracket marks the beginning of the overlap; the right hand bracket marks the end of the overlap.
- :: Colons indicate a lengthening of the sound just preceding them, proportional to the number of colons.
- ... Three dots indicate an incomplete utterance.
- A hyphen at the end of a pre-interrupted talk indicates that a continuation of the talk comes after the interruption.
- A hyphen at the beginning of a post-interrupted talk indicates that a continuation of the pre-interrupted talk.
- (0.53) Numbers in parentheses indicate durations of silence, in hundredths of seconds.
- ITU Capitalisation indicates prominence
- == An equal sign indicates “latching”; there is no perceivable interval between the end of a prior turn and the start of a next turn.
- <f> Placed below a given syllable or sequence of syllables indicates that it is produced louder than the neighbouring syllable.
- <p> Placed below a given syllable or sequence of syllables indicates that it is produced softer than the neighbouring syllables.
- <CRES> Placed below a given syllable or sequence of syllables indicates that it is produced with increasing loudness.
- <DEC> Placed below a given syllable or sequence of syllables indicates that it is produced with decreasing loudness.
- <al> Placed below a given syllable or sequence of syllables indicates that it is pronounced more quickly than the surrounding syllables.
- <sl> Placed below a given syllable or sequence of syllables indicates that it is pronounced more slowly than the surrounding syllables.
- <H> Placed below a given syllable or sequence of syllables indicates that it is uttered with a higher pitch than the surrounding syllables.
- <L> Placed below a given syllable or sequence of syllables indicates that it is uttered with a lower pitch than the surrounding syllables.

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