Text, rhythm and metrical form in an Aboriginal song series

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Abstract
Setting words to (musical) rhythm is an attempt to match rhythmic positions and syllables in an aesthetically appealing manner. In English songs acceptability is based on two separate but interactive judgments: matching stress with metrically strong positions, and matching prosodic constituents with rhythmic constituents [1]. This paper investigates a genre of Aboriginal songs and finds that while prosodic and rhythmic constituents match, there is no requirement to match stress. Instead, the placement of syllables is conditioned by a caesura (word boundary rule) and a hierarchy whereby rhythmical units with fewer notes must not precede ones with more.1

Index Terms: metrics, poetics, Aboriginal songs, Australian languages

1. Introduction
This paper explains the set of phonological structures constituting a well-formed line in a genre of traditional Kaytetye songs of Central Australia known as Akwelye. The explanation goes beyond a description of different kinds of feet that combine in various ways to form a line by aiming to generate ‘correct’ rhythmic lines and account for why other rhythmic settings do not occur (and indeed are not permissible). In this way I draw upon the generative metrics tradition [2] and in particular, Bracketed Grid Theory [3].

Because rhythm and melody are independent in this song genre (as is the case in most Central Australian songs), no analysis of the relationship between melodic pitch and prosodic stress in the speech equivalents has been undertaken. That is, a rhythmic textline can be sung to different parts of the melodic line, so any given rhythmic text line does not have a single melodic pitch.

1.1. The material
The Akwelye songs making up this study were recorded by the author in 1999 and 2000. As well, previous recordings of Akwelye made in the 1970s and 1980s with mostly the same singers have been analysed by the author and the texts translated with the singers. Out of a total of seven performances of this song series there are 91 different text lines which form the basis of the analysis. There are also an additional 4 polyrhythmic text lines. However the text and beating accompaniment in these songs is vastly different to the 91 metrically aligned songs and so these are not considered here.

2. The metrical grid
Rhythm can be represented by a metrical grid embodying information about prominence, rhythmic length, grouping structure and places where a word boundary must occur (caesura). The bracketed grid in (1) is equivalent to that represented in standard musical notation as \[\begin{array}{c|c|c}
\hline
& x & x \\
\hline\end{array}\].

(1) \[\begin{array}{c|c|c|c}
\hline
& x & x & x \\
\hline
\end{array}\] Gridline 0

(2) \[\begin{array}{c|c|c}
\hline
& x & x \\
\hline
\end{array}\] Gridline 1

(3) \[\begin{array}{c|c|c|c}
\hline
& x & x & x \\
\hline
\end{array}\] Gridline 2 (foot)

In (1) the gridline 0 asterisk show four timing units of equal length. These form binary units, represented by a left parentheses ‘(’). The right-most timing unit of each group then ‘projects’ to gridline 1, which in turn projects to gridline 2. The bracketed grid embodies information about relative prominence of its terminal positions (the positions underlined). A gridline 0 terminal position is stronger than both a gridline 1 or 2 position. The gridline 1 position is the level of the tactus—where the beating accompaniment occurs. The vertical line at the right edge of the grid represents the only position where a word boundary can occur.

2.1. Matching syllables to the grid
A text is matched to the grid according to conditions in (2):

(2) (a) a syllable is matched to one or more gridline 0 asterisks
(b) a foot must contain at least 2 syllables
(c) only a syllable projecting to gridline 2 can match more than one gridline 0 asterisks

The possibility of a cell containing a single note \[\hat{\h}\] is excluded by (b), and (c) means that only the last syllable of a word can extend for more than one timing unit. (2) permits only the rhythmic in (3).

(3) \[\begin{array}{c|c|c|c}
\hline
& x & \hat{\h} & x \\
\hline
\end{array}\] 0 Gridline

(4) \[\begin{array}{c|c|c|c}
\hline
& x & \hat{\h} & x \\
\hline
\end{array}\] 1 Gridline

(5) \[\begin{array}{c|c|c|c}
\hline
& x & x & \hat{\h} \\
\hline
\end{array}\] 2 Gridline

2.2. Generating a rhythmic text line
The conditions in (4) limit the number and order of feet in a well formed line:

(4) (a) a line must consist of at least two feet and a maximum of four
(b) a foot must have the same or one less note than that preceding it
(c) terminally heads can match a single Gridline 0 timing unit (i.e. be short) only in the first foot

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1 I thank Nigel Fabb for providing helpful comments on earlier drafts of this article.
(d) a hemistich must have one less syllable than that preceding it

Condition (4)(a) limits the length of a line and excludes lines from containing a single foot. Condition (b) limits the relative ordering of feet. It excludes the following sequences anywhere in the line:

\[(5) \begin{align*}
&* \quad \begin{array}{c}
\vdots \\
\vdots \\
\vdots
\end{array} \\
&* \quad \begin{array}{c}
\vdots \\
\vdots \\
\vdots
\end{array} \\
&* \quad \begin{array}{c}
\vdots \\
\vdots \\
\vdots
\end{array}
\end{align*}\]

Condition (c) limits the position of the four-syllable foot (iii) to the first position in a text line. Condition (d) defines a line with four feet as two near identical halves (hemistiches). (5) generate only the lines in Table 1.

<table>
<thead>
<tr>
<th>1st position of cell in line</th>
<th>2nd position of cell in line</th>
<th>3rd position of cell in line</th>
<th>4th position of cell in line</th>
<th>no. of rhythmic cells</th>
<th>no. of text lines</th>
</tr>
</thead>
<tbody>
<tr>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>i+i+i+i</td>
<td>1</td>
</tr>
<tr>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>i+i+i+i</td>
<td>1</td>
</tr>
<tr>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>i+i+i+i</td>
<td>1</td>
</tr>
<tr>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>i+i+i+i</td>
<td>1</td>
</tr>
<tr>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>i+i+i+i</td>
<td>1</td>
</tr>
<tr>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>i+i+i+i</td>
<td>1</td>
</tr>
<tr>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>i+i+i+i</td>
<td>1</td>
</tr>
<tr>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>i+i+i+i</td>
<td>1</td>
</tr>
<tr>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>i+i+i+i</td>
<td>1</td>
</tr>
<tr>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>i+i+i+i</td>
<td>1</td>
</tr>
<tr>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>i+i+i+i</td>
<td>1</td>
</tr>
<tr>
<td>Total number of text lines</td>
<td></td>
<td></td>
<td></td>
<td>1+1+1+1</td>
<td>91</td>
</tr>
</tbody>
</table>

Table 1 Akwelye rhythmic lines, showing the number of text lines set to each line

2.3. Syllable counting

To set syllables to the grid it is necessary to know how to count syllables, which requires knowledge of certain features of Kaytetye phonology.

In Kaytetye, all words end in schwa. Before a consonant initial word the schwa is pronounced, e.g. kwerrimpe kwerre [koriimbakura]. However before a vowel initial word the final vowel is not pronounced, e.g. awelye arrerne [awolara]. An additional feature is that the initial vowel, which is always unstressed, is optionally pronounced in many words. For example the word awelye can be pronounced [awol] or [wol]. This variation has lead to debates over the underlying syllable structure of Arandic languages as either CV or VC [4]. In Akwelye lines however, all syllables begin with a consonant.

For the purposes of text-setting, this means that the final schwa is counted but an initial vowel of a word is not counted. It is, however optionally counted if it occurs at the beginning of a line, e.g. arripe is counted as two syllables, and alème is counted as three syllables. These conditions are stated in (6)

(6) a word initial vowel is not counted unless it occurs at the beginning of a line, in which case it may be counted

If the initial vowel of a word is counted it becomes necessary to insert a consonant to make a well-formed CV syllable, as in (7) where arlángkwe becomes le+arlangkwe.

(7) \[
\text{arlángkwe errvénęe arrrème bloodwood_tree blossom put}
\]

Note that counting the initial vowel causes a stress mismatch as the stressed syllable in arlángkwe is set to a gridline 1 position instead of the tactus (gridline 0).

2.4. The caesura

The caesura mark '|' in (1) shows that words and metrical feet must align to make a well-formed line. That the rule applies to phonological words and not lexical words can be seen in the setting of the text consisting of two lexemes aylérnantharre ikngwérre-sleye

In (8) initial vowels are not counted and both verbal elements of the compound verb form separate phonological units which are set to separate metrical feet. (The quality of final vowels is determined by a pattern of alliteration operating at the level of the quatrain.)

Reduplications are similarly set to two metrical feet, so arratye becomes arrätaye-arratye which is two phonological words and so set to two metrical units: narratya + rratya.

The word boundary rule is sensitive to monosyllabic suffixes, i.e. -(V)V, meaning that the foot may align with the root alone. In such cases the suffix becomes the onset of a following vowel initial word and the final schwa is elided, as in (10).

(9) \[
\text{kwerrimpe-le ątyę arrrème}
\]

In (9) the noun alone, excluding its suffix aligns with the metrical unit. This appears to be permissible only with a monosyllabic suffix -(V)CV. Note that this causes a stress mismatch with the following word.

CV syllable structure, the grid and matching rules account for the underlying rhythmic structure of nearly all

1 This condition is difficult to confirm with only two textlines containing the foot.

2 It is not clear whether the stress on the second part of this word is as strong as that on the first part of this word; thus ikngwérre-sleye is possible. However it is not secondary word stress, which occurs in every alternate syllable after primary stress (See Henderson 2002).
3. Optional phonological rule

The optional phonological rule is stated in (10):

(10) A glide initial syllable projecting to gridline 1 may be elided

Elision of a glide-vowel sequence to a single long vowel also occurs in speech, e.g. *aherrke* can be pronounced [aʊʔarko] or [ɑrko]. In *Akwelye* the elision forces the preceding syllable to match more than one gridline 0 asterisks, as in the first word in (11).

(11) [ar ke arkela tyarantlya]  

\[
\begin{array}{cccc}
\ast & \ast & \ast & \ast \\
\ast & \ast & \ast & \ast \\
\ast & \ast & \ast & \ast \\
\ast & \ast & \ast & \ast \\
\end{array}
\]

*ahe*rk-aherrke-le *arrt*erne-nty*le*  

sun-sun-LOC shine-TNS

The matching rules in (2) and (4) apply before the optional phonological rule (10). Any CV sequence which matches a crotchet (\(\bullet\)) at the beginning of a foot (i.e. projects to gridline 1 and matches two gridline 0 positions) is actually a two syllable sequence at the point at which the rhythmic matching rules apply, and is in fact an example of the foot in (3ii) \(\\bullet\bullet\\) as far as the matching rules are concerned.

The optional elision of a glide+vowel sequence of the one text line, at the same performance provides further evidence that this a separate process to that of rhythmic text-setting. The line in (12) was performed as (a) twice, and then later on three times as (b):

(12) (a) [lu la wi yo li]  

(b) [lu la wi li]

\[
\begin{array}{cccc}
\ast & \ast & \ast & \ast \\
\ast & \ast & \ast & \ast \\
\ast & \ast & \ast & \ast \\
\ast & \ast & \ast & \ast \\
\end{array}
\]

*l+awere we*le*re*  

sun-sun-SUN throw-TNS(?)

4. Conclusion

A well-formed *Akwelye* line requires matching textual and rhythmic constituents: phonological words and rhythmic feet. Stress appears to play no role in well-formedness, as both stressed and unstressed syllables align with the tactus (gridline 0).

The rhythmic text lines can be explained by a metrical template with conditions on the length and order of rhythmic units, and rules specifying how syllables should be matched. Fundamental to explaining meter is knowing how syllables are counted; in this case a CV analysis seems better able to account for the rhythmic settings.

Analysing the rhythmic setting of glide-vowel sequences such as (11) and (12) as a result of a subsequent optional phonological rule applied to an underlying foot (3ii) is a more concise account than if four different rhythmic settings were recognised. Furthermore, the optional phonological rule supports the psychological reality of phonemes, as without reference to the phonological structure of these sequences it would be difficult to explain the rhythmic setting of text in *Akwelye* songs.

5. References