The Typology of Tone in Tibetan

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Abstract

This article contributes to Sino-Tibetan phonological typology by exploring tone in one principal member of this language family: Tibetan.

A survey of the variegated stages of tonality attested in modern Tibetan dialects serves as the backdrop for the paper. In the main presentation, the framework of autosegmental phonology is adopted which proves especially revealing for explicating tone representation and tonal processes in Tibetan. A recent autosegmental treatment of Tibetan tone is critically reviewed, followed by a more comprehensive reanalysis with some explicit claims for Lhasa and other tonal Tibetan dialects: (i) The fundamental tonal contrast is register-based, i.e. High vs. Low. (ii) The predictable high tone on non-initial syllables stems from tonal neutralization rather than from left-to-right tone spread. (iii) Tone-spreading rules should be reserved for authentic processes of tonal assimilation. Also discussed are two important related issues: the historical origin of the high tone as the default tone in Tibetan, and the derivational relation between syllable tone and word tone. The proposal for a typological distinction in Sino-Tibetan tonology between template word-tone systems (exemplified by Tibetan), and contourone ones (exemplified by New Shanghai Chinese) concludes the paper.

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I. Introduction

The study of tone has figured prominently in Sino-Tibetan linguistics, for a very good reason: the majority of the extant languages in this family\(^1\) make distinctive use of pitch-related phenomena of one type or another. Considerable progress has been made in recent phonological investigations into the tonology of Sinitic languages (see for example Yip 1980, Yue-Hashimoto 1987, Shih 1986, Bao 1990, and the relevant articles in Buszard-Welcher 1992). Comparable studies on the highly diversified and relatively under-explored Tibeto-Burman languages are however still scanty, with a few outstanding exceptions such as Mazaudon 1977, Michailovsky 1988, Weidert 1987, and Dai 1992. The present study intends to contribute to a better understanding of the typology of tone in Tibetan, one of the principal languages of the Tibeto-Burman family.

An overview of the attested types of tonality in modern Tibetan in §1 puts the paper in perspective; the particular tone system of Lhasa, representing a relatively advanced tonogenetic stage, is then briefly described. In §2 Tibetan tonology is explored from the vantage point of autosegmental phonology, a framework which holds special promise in elucidating tone in Tibetan. The particular autosegmental account of tonal phenomena in four Tibetan dialects given in Duanmu 1992 is critically examined in §2.1; a more comprehensive and explanatory reanalysis is offered in §2.2 which diverges from the foregoing with respect to (i) the representation of the underlying tones, (ii) the source of the high tone on non-initial syllables, and (iii) the role of tone-spreading in Tibetan tonology. Next, two issues involved in the proposed analysis are further explored, bearing respectively on the high tone as the 'default' tone in Tibetan (§3.1), and the problem of whether word-level melody is derived

\(^{1}\) The Sino-Tibetan language family contains at least two subfamilies, Sinitic (Chinese) and Tibeto-Burman. According to a more conservative view in the field, the Miao-Yao and Tai-Kadai languages are not genetically related to Sino-Tibetan.
from syllable tones through 'tone sandhi' (§ 3.2). Based on the findings of this paper, a typological distinction is suggested in the concluding section between template word-tone languages represented by Tibetan and Dongkou Chinese, and contoureme word-tone languages represented by Tamang and New Shanghai Chinese.

1.1. Tonality in Tibetan

Tonality is underdeveloped in Tibetan and some other Tibeto-Burman languages. It is generally held that Old Tibetan was not a tone language, in view of the complete absence of tone-marking in the traditional Tibetan script dating from the seventh century, and a fortiori in view of the existence of modern dialects which remain atonal to this day. Modern Tibetan, however, presents such a variegated scenario of tonal developments that the simple dichotomy of 'tonal' versus 'atonal' dialects seems insufficient. It would be more realistic to plot modern Tibetan dialects along a scale of increasing tonality, ranging from completely atonal to relatively highly tonal as exemplified in Table 1 below, based in part on Huang 1994:

<table>
<thead>
<tr>
<th>Tonality Scale</th>
<th>Description of Each Stage</th>
<th>Representative Dialects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atonal</td>
<td>no phonemic tone or redundant 'habitual' tone</td>
<td>Ndzorge; Ngaba</td>
</tr>
<tr>
<td></td>
<td>no phonemic tone; redundant 'habitual' tone</td>
<td>Labrang; Zhangla</td>
</tr>
<tr>
<td></td>
<td>tone phonemic in restricted environments only</td>
<td>Amdo Sherpa; Balti</td>
</tr>
<tr>
<td></td>
<td>tone generally phonemic; tone values unstable; non-contrastive in some syllable types</td>
<td>Derge; Chamdo</td>
</tr>
<tr>
<td></td>
<td>tone values stable; redundancy high</td>
<td>Lhasa; Gar</td>
</tr>
<tr>
<td></td>
<td>additional contrast between falling and level contours</td>
<td>Shigatse; Dzongkha</td>
</tr>
</tbody>
</table>

Table 1: The Tibetan Tonality Continuum

2. Chinese-like, or omnisyllabic (Matisoff 1991:491) tone systems where all syllables normally carry contrastive tone are lacking in many Tibeto-Burman branches, such as Tani, West Himalayish, Bodo-Garo, and Bodic (including Tibetan).
At one end of the above scale are found dialects in which all syllable types carry a high (falling) tone when uttered in isolation, whereas the initial syllable of polysyllabic words are predictably low-pitched. This is, of course, the completely atonal stage, represented by such Amdo dialects as Ndzerge (Written Tibetan: mDzod-dge; Sun 1986), Amchog (A-mchog; Wu 1982), and Ngaba (rNga-ba; Huang 1994); Old Tibetan, in all likelihood, also belonged to this type. The next stage is marked by the genesis of 'habitual tone' (Hu 1980: 31) or 'natural tone' (Huang 1994: 2), i.e., fixed redundant pitch patterns determined either by the voicing state of syllable initials such that voiced and voiceless initials respectively condition low and high pitch in such dialects as Labrang (bLa-brang; Hua 1980:72, Hu 1980: fn. 20) and Daofu (rTa’u; Huang 1994: 2), or by syllabic quantity such that long syllables with certain types of initials carry a redundant rising pitch in such dialects as Zhangla (lCang-la) and Qiuji (Chos-rje).3 Tone, however, did not become contrastive until the emergent-tone stage where a limited number of tonally distinguished minimal pairs began to enter the scene. Two subtypes of this stage can be identified; contrastive tones are either restricted to certain syllable types, such as those with nasal initials in the case of Amdo Sherpa (A-mdo Shar-pa; Nagano 1980), or apply only to disyllabic and trisyllabic nouns as is the case in Balti (sBal-ti; Sprigg 1966: 186-9).4 Such varieties of Khams Tibetan as Derge (sDe-dge; Qu 1979:121; Huang 1994: 3) and Chamdo (Chab-mdo; Liu 1984) embody the next stage of tone development, with

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3. Written Tibetan (hereafter WT) forms in this paper will be given in the standard system of transliteration proposed in Wylie 1959.
4. Hence the popular slogan 消音消影 'High-pitched if the initial is voiceless; low-pitched if the initial is voiced.' It is often implied that this slogan can be applied to all Amdo dialects (Hu 1980: 31; fn. 20; Hua: 1980:72-3), and even to Old Tibetan also (Hu 1980: 31). One of the important contributions of Huang 1994 is to dismiss this misconception by pointing to the existence of such Amdo dialects as Ngaba where the above slogan does not hold. See also §3.1 below.
5. Zhangla (昌遐, Mayi Village, Shuijiang Township, Zhangla District, Songpan County) and especially Qiuji (求吉, Mazang Village, Qiuji District, Ruqerqai County) are aberrant forms of Amdo Tibetan. Data were recorded by the author in western Sichuan during two recent field trips.
6. Huang 1994:2-3 reports a few minimal pairs on monosyllables also in her Balti consultant's speech.
distinctive tones on most syllable types but variable and hence non-distinctive pitch patterns on others (see §3.1 below). Then came the stage represented by Lhasa as well as many other varieties of tonal Tibetan where contrastive tones have permeated all syllable types, nevertheless with a high degree of redundancy, being multiply realized by such features as phonation type, final glottality, tensity, and syllable quantity, as well as pitch. The most advanced tonogenetic stage in Tibetan is reached by such dialects as Shigatse and Dzongkha (rDzong-skad; Mazaudon and Michailovsky 1988), where a new distinctive (steep) falling pitch arises in compensation for the ?-coda apocope in the case of Shigatse (Qu 1981a: 186-7; Huang 1994: 4) or sonorant-coda apocope as well as syllable contraction in the case of Dzongkha, making it necessary to recognize both a register (high vs. low) and an intersecting contour (falling vs. level) contrast.

One of the most important generalizations on Tibetan tone, even in its most advanced state, is that the primary register contrast is realized only on the initial syllable of a phonological word; all other syllables are predictably high-registered. The drastic neutralization of tone in polysyllabic domains results in at most one contrastive tone per (phonological) word in Tibetan regardless of the number of constituent syllables, hence the growing consensus that the Tibetan tone system is word-based rather than syllable-based (Sprigg 1954; Mazaudon 1977; Ossorio 1982:2.5.6; Shih 1986: §4.5).

1.2. Tone in Lhasa Tibetan

Although Lhasa is the best-known variety of modern Tibetan, some areas in Lhasa phonology, in particular its tone system, remain controversial. A number of factors are responsible for this lack of consensus. First, not all sources on alleged 'Lhasa Tibetan' represent genuine samples of the native speech of the Lhasa city. Second, elicitation methods

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7. Also to be included in this type are such other varieties of Central Tibetan as Langkazi (SNang-dkar-rtsis) (Qu 1981a), and Shap (Ossorio 1982).
8. Except unstressed elicitic syllables (see §2.2) and a minor case to be discussed in §3.2.2.
which make no provision for the pronounced stylistic differences in Tibetan may yield dubious results (Sprigg 1993). Moreover, how one should properly handle multiple phonetic realizations of tone and tonal neutralization in non-initial syllables mentioned above contributes further to divergent interpretations of Lhasa tonology (Tan 1982; Hu 1980).

Examine now the following table of the citation pitch patterns of Lhasa monosyllables reported in Hu 1980 and Hu et al. 1982, based on an instrumental study of the colloquial-style pronunciation of three native speakers.9

<table>
<thead>
<tr>
<th>Register</th>
<th>WT Form</th>
<th>Lhasa Form</th>
<th>Pitch Pattern</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGH</td>
<td>bka'</td>
<td>'ka'</td>
<td>high (slight) falling</td>
<td>'decrease'</td>
</tr>
<tr>
<td></td>
<td>ka-ba</td>
<td>ka'</td>
<td>high level</td>
<td>'pillar'</td>
</tr>
<tr>
<td></td>
<td>bkag</td>
<td>ka?</td>
<td>high (steep) falling</td>
<td>'hinder'</td>
</tr>
<tr>
<td></td>
<td>skam</td>
<td>ka.m</td>
<td>high level</td>
<td>'be dry'</td>
</tr>
<tr>
<td></td>
<td>bskams</td>
<td>kam?</td>
<td>high (steep) falling</td>
<td>'make dry (perfective=pl)'</td>
</tr>
<tr>
<td>LOW</td>
<td>sga</td>
<td>'ka'</td>
<td>low (slight) rising</td>
<td>'saddle'</td>
</tr>
<tr>
<td></td>
<td>bsgar</td>
<td>ka'?</td>
<td>low level-rising</td>
<td>'fasten'</td>
</tr>
<tr>
<td></td>
<td>'gag</td>
<td>ka'?</td>
<td>low rising-falling</td>
<td>'be clogged'</td>
</tr>
<tr>
<td></td>
<td>gam</td>
<td>ka.m'</td>
<td>low level-rising</td>
<td>'box'</td>
</tr>
<tr>
<td></td>
<td>'gams</td>
<td>kam?</td>
<td>low rising-falling</td>
<td>'put in mouth (pl)'</td>
</tr>
</tbody>
</table>

Table 2. Lhasa Monosyllabic Citation Pitches

9. Pitch patterns are given in the familiar numerical tone notation (highest pitch level = 5; lowest pitch level = 1). See also the instrumental study reported in Kjellin 1977, which yielded comparable results. However, Sprigg 1993 argues against the citation-form approach, warning that literate Tibetans may give spelling-style pronunciations when uttering syllables in isolation. However, I have had quite different personal experiences working with my literate Amdo Tibetan consultant, who, keen on the stylistic differences, has no difficulty whatsoever enunciating citation forms in the colloquial style on demand (see Sun 1986: Chapter 4). It would be only fair to point out that the linguists conducting the experimental study reported in Hu et al. 1982 were also fully aware of stylistic distinctions in Lhasa Tibetan, and explicitly state: 'this experiment was based entirely on the colloquial pronunciation ... as natural in fluency and tempo as in normal daily conversation as possible...' (Hu et al. 1982:22; translation mine).
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Several observations can be made about the preceding data:

1. High-register syllables are characterized by a fall in pitch, and low-register syllables by a rise in pitch.
2. On long syllables, pitch movements are flattened.
3. The glottal stop coda -? induces a drop in pitch.
4. There is at most a two-way register contrast, high versus low, on any of the five rhyme types in Lhasa (-V, -VV, -VP, -VM, and -VMP; where V = vocalic nucleus; P = stop coda, including the glottal stop -?; M = sonorant coda).

The complementarily distributed pitch patterns in Lhasa, therefore, leave much room for different tonemic interpretations, four, of which are summarized below (cf. Hu 1980:23-4):

(2) Four-tone analysis A: This system, employed by Tibetologists affiliated with the Chinese Academy of Social Sciences, marks glottal stop but regards syllable quantity differences as inherent features of tone, yielding four tones: 'high short tone' ³⁹, 'low short tone' ³⁵ vs. 'high long tone' ³⁶ and 'low long tone' ³⁶:

ka³⁴ → ka³⁵ 'decrees'  ka¹² → ka¹³ 'saddle'
ka³² → ka³³ 'hinder'  ka³¹² → ka³¹³ 'be clogged'
kam³² → kam³¹ 'make dry (pf)'  kam³¹² → kam³¹³ 'put into mouth (pf)'
ka³³ → ka³² 'pillar'  ka¹² → ka¹¹ 'fasten'
kam³³ → kam³⁵ 'be dry'  kam¹² → kam¹¹ 'box'

(3) Four-tone analysis B: This system, devised and used by Tibetologists from the Central University of Nationalities in Beijing, represents

10. Thus, the statement that 'Lhasa Tibetan has six citation tones' (Shih 1986: 19) is valid only at the phonetic level.
11. Kitamura and Nagano 1990 adopts a similar transcription system for Lhasa Tibetan which, however, is word-based.
syllable quantity segmentally (quantity in syllables closed by sonorant codas are not marked) and gives falling pitch tonemic status, yielding four tones: -f = high level; -h = high falling; -v = low rising; -w = low falling:

\[ \text{ka}^{12} \rightarrow \text{gaf} \quad \text{'decree'} \quad \text{ka}^{12} \rightarrow \text{gav} \quad \text{'saddle'} \\
\text{ka}^{13} \rightarrow \text{gaaf} \quad \text{'pillar'} \quad \text{ka}^{112} \rightarrow \text{gaav} \quad \text{'fasten'} \\
\text{ka}^{12} \rightarrow \text{gah} \quad \text{'hinder'} \quad \text{ka}^{112} \rightarrow \text{gaw} \quad \text{'be clogged'} \\
\text{ka:m}^{12} \rightarrow \text{gamf} \quad \text{'be dry'} \quad \text{ka:m}^{12} \rightarrow \text{gmv} \quad \text{'box'} \\
\text{ka:m}^{12} \rightarrow \text{gamh} \quad \text{'make dry (pf)'} \quad \text{ka:m}^{12} \rightarrow \text{gmv} \quad \text{'put into mouth (pf)'} \\
\]

(4) Four-tone analysis C: This system, proposed by Chang Kuin and Betty Shefts Chang (Chang and Shefts Chang 1964; Chang and Chang 1978) and adopted in a number of influential teaching materials on Lhasa Tibetan by John Goldstein, has become by far the best-known system in use outside of China. Length is represented segmentally while falling pitch acquires tonemic status. Unlike analysis B, where the two falling tones are marked distinctly (i.e., high falling = -h; low falling = -w), this system recognizes only two register tones on short syllables, but posits for long syllables an additional falling pitch in combination with the two registers, yielding four tones: high-high, low-low, high-falling, and low-falling:

\[ \text{ka}^{14} \rightarrow \text{q} \quad \text{'decree'} \quad \text{ka}^{12} \rightarrow \text{q} \quad \text{'saddle'} \\
\text{ka}^{13} \rightarrow \text{qaa} \quad \text{'pillar'} \quad \text{ka}^{113} \rightarrow \text{qaa} \quad \text{'fasten'} \\
\text{ka}^{12} \rightarrow \text{qaa} \quad \text{'hinder'} \quad \text{ka}^{112} \rightarrow \text{qaa} \quad \text{'be clogged'} \\
\text{ka:m}^{12} \rightarrow \text{qam} \quad \text{'be dry'} \quad \text{ka:m}^{12} \rightarrow \text{qam} \quad \text{'box'} \\
\text{ka:m}^{12} \rightarrow \text{qam} \quad \text{'make dry (pf)'} \quad \text{ka:m}^{12} \rightarrow \text{qam} \quad \text{'put into mouth (pf)'} \\
\]

12. Syllables with the glottal stop coda are represented in this system as long syllables. This has to do with the fact that -VV is often realized as -VV in the first syllable of multisyllabic words in Lhasa (Qu 1981a:191·2). Moreover, according to Hu 1980: fn. 13, some Lhasa speakers pronounce all glottal-coda syllables as long open ones (Rinzin Wangpo, R. K. Sprigg’s main Lhasa Tibetan consultant, is one such speaker).
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(5) Two-tone analysis: This is the tonemic system of Lhasa advocated in this paper. Both glottality and quantity are marked segmentally, leaving pitch register as the only relevant tonal feature:

\[
\begin{align*}
\text{ka}^{34} & \rightarrow \text{kā} \quad \text{`decree'} & \text{ka}^{12} & \rightarrow \text{kā} \quad \text{`saddle'} \\
\text{ka}^{33} & \rightarrow \text{kāā} \quad \text{`pillar'} & \text{ka}^{113} & \rightarrow \text{kāā} \quad \text{`fasten'} \\
\text{ka}^{32} & \rightarrow \text{kā?} \quad \text{`hinder'} & \text{ka}^{113} & \rightarrow \text{kā?} \quad \text{`be clogged'} \\
\text{kam}^{38} & \rightarrow \text{kām} \quad \text{`be dry'} & \text{kam}^{112} & \rightarrow \text{kām} \quad \text{`box'} \\
\text{kam}^{35} & \rightarrow \text{kām?} \quad \text{`make dry (pf)} & \text{kam}^{122} & \rightarrow \text{kām?} \quad \text{`put into mouth (pf)}
\end{align*}
\]

Most phonologically defined words in Lhasa Tibetan are more than one syllable long. They include, in the main, nominal and verbal stems with their respective clitics and affixes, and disyllabic (and sometimes trisyllabic) compounds. Phonological words are characterized by a number of internal sandhi phenomena such as the presence of certain medial intrusive consonants, vowel harmony, deaspiration of stop/affricate initials, voicing of second-syllable voiceless sonorant initials, and above all, tonal modulations. Table 3 below lists the six surface pitch patterns pronounced in isolation and the respective modulated pitch shapes when these occur in the initial, medial, and final syllables of polysyllabic words (based on Hu 1980): 13

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13. These are the remnants of Old Tibetan consonant clusters, e.g. in the Lhasa word mentā 'firearm' (< mṛt 'fire' + tā 'arrow'), the medial nasal -n- is a reflex of the nasal preradical m- of the second morpheme tā (< WT māṅ). See Ossorio 1982 5.1.4 and Sun 1986: 4.4 for more details.
14. These are the phonetic exponents of the interverb junction (i.e. close juncture) prosody (Sprigg 1954: 146-9). For a different set of sandhi devices in the atonal Ndzorge Shāme Xara dialect, see Sun 1986: Chapters 3 & 4.
15. Polysyllabic words in Tibetan are at most three syllables long. Quadrasyllabic expressions in Tibetan behave tonally as combinations of two disyllabic words (Qu 1981b: 21). In the Lhasa system, the pitch of a long second syllable is rising rather than level if the first syllable contains a low tone in polysyllabic words. Moreover, unstressed syllables also behave differently (see §2.2 below).
Table 3. Lhasa Pitch Patterns in Polysyllabic Words

<table>
<thead>
<tr>
<th>Monosyllabic Tone Value</th>
<th>Tone Value in Polysyllabic Words</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Initial Syllable</td>
</tr>
<tr>
<td>54</td>
<td>55</td>
</tr>
<tr>
<td>55</td>
<td>55</td>
</tr>
<tr>
<td>52</td>
<td>55</td>
</tr>
<tr>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td>113</td>
<td>11</td>
</tr>
<tr>
<td>132</td>
<td>11</td>
</tr>
</tbody>
</table>

(6) a. In the first syllable, the characteristic fall and rise in pitch associated respectively with high- and low-register syllables are not observed; the attested pitches are level in both cases (high level 55 and low level 11).

b. In the medial syllable, if any, the pitch is always high level 55. 

c. In the final syllable, only high-register pitch patterns are found.

Thus, polysyllabic words in Lhasa, as in most other tonal dialects, carry a two-way contrast only in the first syllable; all subsequent syllables are predictably high-pitched.

2. Autosegmental Analyses of Tibetan Tonology

Autosegmental phonology, an offshoot of non-linear phonology

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16. An important exception is the process of Low Tone Assimilation; see (7e) and (16b) below.
developed by John Goldsmith and others (Goldsmith 1979, 1990; Yip 1980), is the descriptive model adopted in a recent article by Duanmu San on the analysis of tone in modern Tibetan (Duanmu 1992), where it is contended that an autosegmental approach to Tibetan tone can bring out insights missed by the traditional, syllable-based approach.

Indeed, autosegmental phonology seems a particularly fitting framework for the insightful treatment of tone in Tibetan, given the characteristics of Tibetan tone mentioned above. First, it is the contrast in (high vs. low) pitch register that is fundamental in Tibetan, whereas pitch contours are often redundantly associated with particular syllable types. Thus, a high tone in Lhasa falls slightly, stays level, or falls steeply depending on whether the tone-bearing syllable is short, long, or checked/glottalized. Dialects also differ significantly with respect to how surface pitch contours are realized (see Table 5 below). As has been amply demonstrated in previous work on African tone languages, the autosegmental approach is particularly suited for the representation of register-tone systems. Moreover, autosegmental phonology allows both general and localized tone processes in Tibetan to be characterized in a revealing way. Consider for example the pervasive reduction of tone in Tibetan non-initial syllables, resulting in highly restricted tone patterns in polysyllabic words. Instead of exhaustively listing individual pairs of citation tones and the respective 'sandhi tones' as is done in the traditional approach (see for example Qu 1981b), an autosegmental analysis can reflect the simplicity of the underlying tonal neutralization process by formulating a simple unitary tone rule which nullifies the underlying tones on non-initial syllables, leaving only the initial tone to bear the tonal contrast of the entire word (see §2.1 and §2.2 below).

Concurring with Duanmu's general points on the usefulness of the autosegmental model in representing tonal oppositions and processes in Tibetan, we nevertheless hold rather different views regarding what constitutes an adequate autosegmental treatment of Tibetan tone, for

17. Subsequent reference to this source will be by data-set number and page number only.
reasons we shall see below.

2.1. Duanmu's Analysis

In Duanmu 1992, tonal variations in monosyllabic and polysyllabic expressions in four Tibetan dialects, Lhasa, Zedang (rTsed-thang), Gar (sGar) and Gaize (sGer-rtse), are examined in order to show that tone in Tibetan behaves in ways similar to tone in other parts of the world, such as Africa and east China (the Wu dialects of Sinitic), in that (i) contour tones are made of level tones, and (ii) tones lie on an independent tier and may spread across segments.

For Duanmu, all four varieties of Tibetan have the same system of high (H) and rising (LH) underlying syllable-tones, differing from each other mainly in the tone-mapping rules. The set of tone rules proposed by Duanmu for Lhasa are given in (7) below:

(7) a. Delete tones from non-initial syllables.
    b. Associate tone to syllables one-to-one, left to right.
    c. If there are more syllables, spread the last tone to excess syllables.
    d. If there are more tones, link excess tones to the last syllable.
    e. If a L precedes a final long syllable with a H, spread L to the latter.

The relations between the underlying tones and their realizations in different syllable types are given in Table 4 below (adapted from Duanmu 1992: 75):

18. Lhasa, Zedang, and Gar are dBus-gTsang or Central dialects, whereas Gaize belongs to the heterogeneous Khams dialect group, according to Qu and Tan 1983.
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<table>
<thead>
<tr>
<th>Underlying Tone</th>
<th>Syllable Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>-V (open syllable)</td>
</tr>
<tr>
<td>LH</td>
<td>-VV/-VM (long syllables, including long open syllables and closed unchecked syllables)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Realization</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>54</td>
<td>12</td>
</tr>
<tr>
<td>55</td>
<td>113</td>
</tr>
<tr>
<td>52</td>
<td>132</td>
</tr>
</tbody>
</table>

Table 4. Lhasa Surface Pitch Patterns and Underlying Tones in Duanmu's Analysis

Consider now the sample derivations of the monosyllable ka:113 'fasten; install', and the disyllabic compound me:11-po:113 'coal-pan' (composed of me:12 'fire' and po:113 'bowl').

(8) 7b 7d
    \[ \text{ka:} \xrightarrow{+} \text{ka:} \xrightarrow{+} \text{ka:}^{113} \]
    \[
    \begin{array}{c}
    \text{LH} \\
    \text{LH} \\
    \text{LH}
    \end{array}
    \]

(9) 7a 7b 7e
    \[ \text{me-po:} \xrightarrow{+} \text{me-po:} \xrightarrow{+} \text{me-po:} \xrightarrow{+} \text{me}^{11}-\text{po:}^{113} \]
    \[
    \begin{array}{c}
    \text{LH} \\
    \text{H} \\
    \text{LH} \\
    \text{LH} \\
    \text{LH}
    \end{array}
    \]

Only two aspects of the polysyllabic tone patterns in the three non-Lhasa tone systems, where they diverge from the Lhasa system, are treated

---

19. Not mentioned is the rhyme type -VM? which, in contrast with -VM, behaves tonally as a short checked syllable.
20. Actually, the pitch value on the second syllable of this compound should be $^4$ rather than $^{11}$. We will return to this important fact later in this section.
by Duanmu. For one thing, Gar and Gaize, unlike Lhasa, lack the tone-spread rule 7e. Contrast (9) above with (10) below, showing the derivation of the compound for 'coal-pan' in Gar:

(10) 7a 7b
me-po: r me-po: r me1-po: r
LH H LH L H

The second divergent pattern pertains to trisyllabic compounds in Zedang, where the medial tone, rather than being invariably high-toned as in the other dialects, becomes low if the tone of the first syllable is low. This fundamentally assimilatory process is accounted for by appealing to 'edge-in association', expressed as (b) and (c) of the following Zedang tone rules (p. 83):

(11) a. Delete tones from non-initial syllables.
    b. Associate the first tone to the first syllable, and the last tone to the last syllable.
    c. If there are free tones in between, spread the first tone to them.

Consider the sample derivation for the compound word for 'cadre' below:

(12) 11a 11b 11c
le-toe-pa le-toe-pa le-toe-pa le1-toe11-pa
L H H LH LH L H H

Ingenious as it may seem, Duanmu's analysis of Tibetan tone falls short of being completely satisfactory. On the one hand, what he advocates for Tibetan is a typologically odd system of underlying tones. Given a two-tone system, it is in principle far more natural to have a simple contrast of high vs. low registers than a mixed system of level (H)
The Typology of Tone in Tibetan

vs. contour (LH) tones, especially in view of the high variability of pitch contours in tonal Tibetan (Sprigg 1993).

We noted earlier that in Lhasa, as well as in many other Central Tibetan dialects, high-register syllables are characterized by a fall in pitch, and low-register syllables by a rise in pitch when uttered in isolation. To accord the pitch rise associated with the low tone underlying status, i.e. LH, while relegating the pitch fall associated with the high tone to 'domain-final intonation', representing it simply as H, seems rather contrived. The correlation between underlying and surface tones would be much more consistent if both the pitch fall (with high-register syllables) and the pitch rise (with low-register syllables) were regarded as low-level domain-final phenomena, to be dealt with uniformly by language-specific allotonic rules.

In fact, this heterogeneous system of underlying tones is extended by Duanmu not only to Zedang and Gar, whose surface tonal phonetics are akin to those of Lhasa, but even to Gaize, which has the entirely disparate monosyllabic pitch patterns shown below:

<table>
<thead>
<tr>
<th></th>
<th>H</th>
<th>LH</th>
<th>Syllable Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>53</td>
<td>31</td>
<td>short</td>
</tr>
<tr>
<td>2</td>
<td>51</td>
<td>22</td>
<td>long</td>
</tr>
</tbody>
</table>

Table 5. Gaize Underlying and Surface Tones in Duanmu's Analysis

In Table 5, the high tone on long syllables is a steep falling tone while

21 R. K. Sprigg has repeatedly underscored the fact that Tibetan is a register tone system (see for example Sprigg 1990, 1993). Y. R. Chao also recognized the two Lhasa tones as a basic contrast of high vs. low registers, even though he described their actual citation values as contour tones (respectively high falling and low rise-fall) (Chao and Yu 1960:9-12). Other Tibeto-Burman languages with similar two-term register tone systems include PaTani (Saxena 1991), Apatani (Weidert 1987: 56.2), Manipuri (= Meritei: Chelliah 1992), and certain languages of Eastern Nepal, such as Sunwar and Khaling (Michailovsky 1988: 23-9).
the low tones do not rise at all in Gaize, contrary to what the proposed underlying tones H and LH indicate. The obvious mismatch between the underlying and surface tones is dealt with by Duanmu by adding a patch-up rule which tags a L to the right of monosyllables ((38d), p. 81), and, in the case of the low-toned syllables, stipulating that a H tone sandwiched between two L's may 'stay unlinked'; for instance ((39 b.), p. 81):

$$
\text{Tone Association} \quad \text{L-insertion}
$$

$$
\text{LH} \quad \text{LH} \quad \text{L(H)L}
$$

It should be evident by now that Duanmu pays a high cost in descriptive naturalness and plausibility for treating the Tibetan low-register tone as underlyingly LH. This decision is presumably motivated by an important fact related to tonal phonotactics in Tibetan, which, we recall, is that in non-initial syllables of polysyllabic words the tonal contrast is neutralized to a relatively high-pitch tone in all tonal dialects of Tibetan so far recorded. Under Duanmu's analysis, this state of affairs is accounted for by attributing the non-initial high-tone to a H emanated from both underlying tones on the initial syllable through left-to-right tone-spreading.

There are, however, indications that this conception of the origin of the non-initial high tone is misguided. First, the requirement that all underlying tones have a H on the right edge demands in effect that all varieties of tonal Tibetan have only two kinds of underlying tones, high level (H) and rising (LH). This stipulation flies in the face of such surface pitch patterns as falling (HL) in the high-register as well as level (L) and falling (HL) in the low register actually attested in many modern dialects (Qu 1988: 327). We have seen in the above how much Procrustean stretching has to be exercised in order to fit the data into Duanmu's theory of underlying tones in the case of Gaize; even more ad-hoc manipulation will have to be performed if other dialects are taken into consideration.

-300-
Second, treating the low-register tone as LH misses the underlying unity of certain tonal processes. Consider again the pitch patterns me\textsuperscript{11}-po\textsuperscript{113} 'coal-pan' in Lhasa and le\textsuperscript{11}-tee\textsuperscript{11}-pa\textsuperscript{51} 'cadre' in Zedang, where the second syllables become respectively rising and low level when abutting a low-register tone in the first syllable. Intuitively, what is clearly at work here is the low pitch of the initial syllable permeating, to different degrees, the neighboring syllable. The underlying uniformity of the two tonal processes will be directly captured by representing the low-register tones simply as L (see below). Contrast this with Duanmu's approach discussed above (see (10) and (12)), which obscures the relatedness between these two instances of low-tone assimilation by positing distinct tone-association rules. Furthermore, the representation of the low tone as underlyingly LH predicts tonal outputs directly contradicted by actual tone patterns. Observe, for example, the following representations of the morpheme \textit{maq} 'butter' (<WT \textit{mar}) both in isolation and in the compound \textit{tsh\textsuperscript{a}-maa} 'tea and butter' (<WT \textit{ja-mar}) under Duanmu's analysis:

\begin{verbatim}
(14)  ma:       tsh\textsuperscript{a}-ma:
   \ /
  \ /
LH   L   H
\end{verbatim}

Since both occurrences of \textit{maq} 'butter' bear the same LH tones, the prediction is that their surface tones should also be identical. On the contrary, the instrumental research conducted by Hu et al. (1982: 34) reveals that the morpheme for 'butter' has a higher general pitch (\textsuperscript{24}) in the compound 'tea and butter' than its citation pitch (\textsuperscript{13}). If the underlying citation tone of 'butter' is posited simply as L, then the two occurrences of 'butter' will have distinct tone structures, L vs. LH:

\begin{verbatim}
(15)  ma:       tsh\textsuperscript{a}-ma:
  \ /
 |   \ /
L   L   H
\end{verbatim}
Crucially, the presence of a H tone in the non-initial occurrence of the morpheme for 'butter' (on the provenance of this H tone, see below) provides a natural explanation for the heightened pitch in this particular environment. This constitutes further, and in our opinion clinching, evidence that the underlying low-register tone in Tibetan should be no more complex than L, and that the high pitch of non-initial syllables in Tibetan is by no means inherited from the initial syllable.

2.2. Alternative Analysis

The above arguments, as well as insights distilled from a long tradition of Tibetan tonal research (Jäschke 1881: xiii-xxi, Chao and Yu 1930, Miller 1953, Mazaudon: 1977: §3.1.; Sprigg 1954 through 1993), make it clear that the underlying tonal representations in Tibetan should be none other than H(igh) vs. L(ow) registers.22 The observed pitch contours which appear on the last syllable of phonological words differ from dialect to dialect and may vary from one phonological or sociolinguistic context to another even within the same dialect (Sprigg 1993). Such largely predictable domain-final contours, rather than being represented underlyingly, should be generated by dialect-specific detail rules. Thus, there are distinct allotonic rules for Lhasa and Gaize Tibetan to the effect that, for instance, the underlying low tone tends to be realized in short open syllables with a slight rising pitch in the former dialect but with a slight falling pitch in the latter.

Also at variance with Duanmu’s analysis is our account of the predictable high register on non-initial syllables in Tibetan polysyllabic words. We contend, following a well-known principle in markedness

22. At least for those dialects (e.g. Lhasa) where the (steep) falling pitch can be consistently derived from the presence of the glottal-stop coda by an automatic allotonic process. Only in such dialects as Shigatse (Qu 1981a, 1988, Huang 1994) where the loss of the glottal stop makes the steep pitch fall no longer predictable from the segmental structure, is it justified to recognize both a register (high vs. low) and a contour (level vs. falling) distinction (for an autosegmental representation of tone in such dialects, see §4 below).
theory, that the high register is the unmarked register in Tibetan since this is the value found in contexts of neutralization (Greenberg 1966: 13-24). The high tone in Tibetan non-initial syllables, in other words, results not from assimilation to a H in the initial syllable but rather from phonological neutralization reducing the original tonal contrast to a non-distinctive high register. In our analysis, this generalization is conveyed by a tone-deletion rule which cancels (neutralizes) the original lexical tones on non-initial tone-bearing syllables, and a default-tone rule which fills the empty tone slots with the default value H. Our proposed tone rules for Lhasa Tibetan can be tentatively given as (16) below:

(16) a. **Tone Association (TA):** equivalent to Duanmu's tone rules (7b), (7c), and (7d) cited above.

b. **Low Tone Assimilation (LTA):** If the tone of the initial syllable is L and the second syllable is long, spread L to the latter.

c. **Tone Neutralization (TN):** equivalent to Duanmu's tone rule (7a).

d. **Default Tone Assignment (DTA):** Fill unspecified tone slots with the default high tone (symbolized herein as boldfaced H).

At this juncture, some remarks are in order concerning two areas of Lhasa tonology not touched upon in Duanmu 1992. First, many grammatical elements such as case markers, verbal endings, and sentence-final illocutionary particles behave as unstressed **toneless** enclitics in Tibetan (Qu 1981b: 20; Wang 1984). Such enclitics, for example the perfective marker -pa-, are **extrametrical** in that the host syllables they are attached to are characterized by domain-final contours, as if the enclitics do not count as part of the tonal domain (Qu 1981b: 20; Mazaudon 1977:82-3; Durand 1990:211-5). Furthermore, TN and DTA apply.

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23. Yip (1993: 257) attributes the default high register on the second syllable in Tibetan compounds rather to the deletion of the laryngeal node (and also the sub- dinate feature [murmur]) on that syllable.
vacuously to toneless syllables for these do not possess corresponding slots on the tone tier to serve as landing sites of the default high tone. Second, toneless syllables are to be distinguished from cases like the high-toned imperfective aspect marker -kî- in Lhasa which, being bound morphemes, never occur by themselves in natural speech and therefore are lexically unspecified for tone. Unlike toneless syllables, however, such bound forms do hold places on the tone tier (hence the slot-holding underline below) and are entitled to receive the default tone.

In the sample derivations of (17) below, contrast the underlying tonal representations of the two phonological words aî-ki-re 'will die' and aî-pa-re 'died', consisting of the verb root aî 'to die', the enclitics =-pa- and =-kî- and the (optionally) toneless auxiliary rî (<WT red 'copula').

\[
\begin{align*}
\text{(17)} & \quad \text{TA} & \quad \text{TN} & \quad \text{DTA} \\
\text{Segmental tier: aî-ki-re} & \quad aî-ki-re & \quad aî-ki-re & \quad aî-ki-re \\
\text{Tone tier} & \quad H & \quad H & \quad H & \quad H & \quad H \\
\text{TA, TN, DTA (non-applicable)} & \quad \text{Segmental tier: aî-pa-re} & \quad aî-pa-re & \quad aî-pa-re \\
\text{Tone tier:} & \quad H & \quad H & \quad H \\
\end{align*}
\]

We turn now to the input conditions of Low Tone Assimilation above, which require that the second syllable be long, consisting either of an

24. There are as yet no experimental studies devoted specifically to the surface pitch shapes of toneless syllables. Wang (1983: 89) observes that such syllables are usually spoken at an indistinct mid pitch, but when the preceding domain-final contour is falling, the fall is normally spread to the toneless syllable. For example, the surface pitch contour of the word tag-la 'then; afterwards' (<WT rjes-la) is toneless.

25. Although this copula is normally weakened to a toneless clitic, it can also be pronounced as a low-toned full syllable rî in deliberate speech (Wang 1985: 86-3).
open syllable with a geminate vowel or diphthong or a syllable closed by
a sonorant coda. Experimental studies on Lhasa Tibetan have shown that
the duration of such syllables is roughly double that of short syllables
(Hu et al. 1982), and in the case of closed unchecked (i.e. sonorant-coda)
syllables, the length of the coda equals that of the preceding nuclear
vowel (Tan and Jiang 1991). Evidently then, long syllables in Tibetan are
bimoraic where the second vowel in the case of long open syllables or the
sonorant coda in the case of closed syllables occupies a separate mora.26
Also, the LTA rule in Lhasa and elsewhere27 must be made sensitive to
moraic structure, otherwise its restriction to long (bimoraic) syllables
would be unexplained. This furnishes direct evidence that the tone-bearing
unit in Tibetan is the mora rather than the rhyme or the syllable.28
Hence, LTA is to be reformulated as (18):

(18) LTA (revised): If the tone of the initial syllable is L and the
second syllable is bimoraic, spread L to the latter, causing the origi-
nally associated tone on the first mora to delink.

Consider now the revised derivation of the same compound mei11-po:24
(phonemicized herein as me-pô) 'coal·pan':

26. Checked syllables in Lhasa Tibetan, including those with a nasal coda followed
by the glottal stop -ʔ are shorter in duration even than short open syllables (Tan
and Jiang 1991). Such syllables are clearly monomoraic.
27. Other dialects that have similar low-tone spreading rules include varieties of
dBus Tibetan spoken near Lhasa city and in Sannan (IHo-kha) District further
to the south, plus a few varieties of Khams Tibetan spoken in Dqing (bDe-chên)
Prefecture in northwestern Yunnan (Tan 1984: 637-9).
28. The same conclusion is reached by Yip (1993: 257) based on different Tibetan
data. Hyman (1993: 77) claims that the tone-bearing unit is universally the mora.
Another case of low tone spreading is presented by Zedang Tibetan where the medial syllable in trisyllabic compounds; rather than bearing the default high tone as in the other dialects, becomes low-toned if the tone of the initial syllable is low. As argued above, this particular type of low-tone spreading obviously involves the same underlying process as LTA and therefore should not be treated by distinct mapping mechanisms. Instead, we propose that Zedang Tibetan adds a late dialect-specific tone rule which spreads an initial low tone to the word-medial syllable. In contrast with LTA, also attested in this dialect, where the spreading L reaches only an adjacent mora, this additional minor rule is more thoroughgoing in causing the entire medial syllable to be assimilated to L. Following are the Zedang tone rules:

(20) a. Tone Association (TA): = (16a)
b. Low-Tone Assimilation (LTA, revised): = (18)
c. Tone Neutralization (TN): = (16b)
d. Default Tone Assignment (DTA): = (16c)
e. Trisyllabic Low-Tone Assimilation (TLTA): In a trisyllabic phonological word, if the tone of the initial syllable is L, spread L to the medial syllable and delink the originally associated tone.
Consider the derivation in (21) for the compound \(\text{le-\text{tse}-pa}\) 'cadre' in Zedang:

(21) \[ TA \quad TN \quad DTA \]

\[
\begin{array}{c}
\text{le-\text{tse}-pa} \\
\uparrow \\
\text{L L L L L} \\
\end{array}
\]

TLTA

\[
\begin{array}{c}
\text{le-\text{tse}-pa} \\
\uparrow \\
\text{L H H L H H} \\
\end{array}
\]

Thus, although we do not ascribe the non-initial high tone to a H spread from the first syllable, tone-spreading rules do have a role to play in our analysis; namely, they are reserved for cases of genuine processes of tonal assimilation such as LTA and TLTA.

3. Related Issues

The foregoing analysis of Tibetan tone hinges on, among other things, the existence of the default high tone and tonal processes that derive word tones from syllable tones. In what follows, additional data will be brought in to further elucidate these descriptive devices.

3.1. Why is the Default Register High in Tibetan?

It will be recalled from §2.2 that the postulation of the high register as the unmarked or default register value in Tibetan stems strictly from marking phenomena observed in synchronic Tibetan phonology. In order to understand this particular skewed distribution of the high vs. the low

---

29. The underlying tone of the bound agentive morpheme -\(\text{pa}\) 'the one who...' is unspecified in our analysis.
register, it is necessary to venture beyond synchrony and consider the paths along which contrastive tone arose in Tibetan. Comparative evidence presented in §1.1 suggests that Tibetan originally must have been in a state where, the effects of stress and intonation aside, all syllables were normally produced in the high register. The postulation of an atonal par excellence proto-stage on the Tibetan tonality continuum seems well-motivated, for this stage is still attested in many modern dialects, as indicated above. The first significant change altering this incipient state was the emergence of the non-contrastive low register in Amdo Tibetan conditioned either by voiced initials or by syllable quantity, depending on dialect (see §1.1 above). It should be emphasized that in this dialect the phonetically conditioned ‘register split’ is limited only to the initial syllable, whereas all non-initial syllables are still high-registered, much as in the tonal dialects (Hua 1980: 72, Hu 1980: fn. 20). The next diachronic step is taken when, as a result of phonological attrition of syllable initials, the low register came to be minimally distinguished from the high register in certain environments, as in the case of Amdo Sherpa mentioned above (Nagano 1980). At this juncture, the interactions of the two pitch registers in many Khams dialects seem highly suggestive. In Derge and Batang (‘Ba’-thang), for instance, syllables which bore voiced obstruent initials in Old Tibetan became low-registered if the original initial underwent devoicing, but stay high-registered where devoicing has not happened, as shown in these Derge examples: ko ‘hear’ < WT go; gu ‘nine’ < WT dgu (Qu 1988:323). Furthermore, register on syllables with synchronically voiced obstruent initials show variation in register which is apparently random in some dialects (e.g. Derge; Huang 1994:3; Chamdo; Liu 1984) or apparently conditioned by the articulatory positions of the

30. This stage, where the low register permeates the entire syllable, is to be carefully distinguished from the universal phonetic tendency for voiced syllable initials to induce a lower onset pitch.

31. The resulting state is the exact inverse of the situation portrayed in the slogan ‘High-pitched if the initial is voiceless; low-pitched if the initial is voiced’ seen above.
root initials in others (e.g. Batang: ndz, êê 'rice' < WT 'bras: ndz, êê 'present' < WT 'gras'; Gesang 1985: 24). The Khams data above would be hard to explain if the phonetically conditioned low pitch is assumed to be always present on voiced-initial syllables (e.g. Hu 1980:51). If, instead, we assume a uniform high-register starting point for Tibetan, then the scenario of tonogenesis in this language can be conceived of as the emergence of the distinctive low register which has encroached gradually on the territory of the high register. The unmarked register in modern Tibetan is high simply because this was the original state of the ancestral language ubiquitously retained in the modern dialects. Thus, granting the non-initial high register default status not only is well-motivated synchronically, but also expresses an important generalization in Tibetan phonological diachrony.

3.2. Is There 'Tone Sandhi' in Tibetan?

As indicated above, the proper domain for tone in Tibetan is the (phonological) word where, regardless of the number of constituent syllables, contrastive pitch register is borne by the word-initial syllable. Since most morphemes in Tibetan are tone-bearing monosyllables (hence the apt term 'morphosyllables' proposed by Light 1978), the question arises as to how, given a polysyllabic word, the word tone should be related to the underlying tones of the constituent morphosyllables. Sprigg 1975:179 argues explicitly against deriving the latter from the former:

I... find it structurally misleading to describe the lexical items sgam 'box', ja 'tea', and ye (g) 'letter' that occur in the first-syllable place of the words sgam-chung, ja-ldong, and ye-ge with contrastive low pitch as having changed tone from low tone to high tone in the words leangs-sgam, gsoi-ja, and lam-yig simply

---

32. The effects of the low register invading non-initial syllables can also be witnessed in the various rules of Low Tone Assimilation discussed in this paper (see 25b, 28d, in 22.2 and 27 in 33.2 below).
because, in these last three words, those lexical items have a high pitch, the non-contrastive high pitch appropriate to the second-syllable place in those words...

Ossorio 1982: 57; 114, sharing Sprigg's conviction, denies in even stronger terms the existence of 'tone changes' in Tibetan not only diachronically (and we agree, see §4 below), but also synchronically:

There is no evidence that the restricted tonal patterns of polysyllabic words ever developed through sandhi changes of the tones carried by the monosyllabes involved... Using the word as the domain of tone there are no tones to be raised on non-initial syllables; never, at any stage in the derivation, do such syllables carry low tone.

These claims, however, must be modified in view of the counter-evidence to be presented in the following sections.

3.2.1. Low Tone Assimilation (LTA) in Purang

In §2.2 we inspected in detail a case of tonal assimilation, LTA, attested in many Tibetan dialects. An interesting variant of LTA is reported in the Purang dialect where the initial low tone spreads to the right when the second syllable is originally low-toned, but unlike in the ordinary LTA, tone-spreading does not occur if the second syllable is originally high-toned (Tan 1984:633-5). The Purang version of Low Tone Assimilation (LTA') can be stated as (22) (tone rules in Purang are otherwise identical to those in Lhasa):

(22) LTA': If the tone of the initial syllable is L and if the second syllable is low-toned and bimoraic, spread L to the latter and delink the originally associated tone on the first mora.

Contrast the derivations in (23-24) of the compounds ལོ་གྱིི་-བིགྱིི་ིི་
'serf' (phonemicized herein as \( \text{aig-tshen} < \text{WT zhing} \ 'field' + \text{bran} \ 'slave') and \( \text{mi}^{11}-\text{maog}^{55} \) 'populace' (phonemicized herein as \( \text{mi-maog} < \text{WT mi} \ 'human' + \text{dmangs} \ 'multitude, vulgar'): 

\[
\begin{array}{c|c|c|c|c|c|c|c}
\text{TA} & \text{LTA'} & \text{TN} \\
\hline
\text{aig-tshen} & \text{aig-tshen} & \text{aig-tshen} & \text{aig-tshen} \\
\mu & \mu & \mu & \mu \\
L & L & L & L \\
\end{array}
\]

\[\text{DTA} \rightarrow \text{aig-tshen}^{14}\]

\[
\begin{array}{c|c|c}
\text{L} & \text{H} & \end{array}
\]

\[
\begin{array}{c|c|c|c|c|c|c|c}
\text{TA} & (\text{LTA'}: \text{non-applicable}) & \text{TN} \\
\hline
\text{mi-maog} & \text{mi-maog} & \text{mi-maog} \\
\mu & \mu & \mu & \mu \\
L & H & L & H \\
\end{array}
\]

\[\text{DTA} \rightarrow \text{mi-maog}^{55}\]

\[
\begin{array}{c|c|c}
\text{L} & \text{H} & \end{array}
\]

Thus it is clear that LTA', a tonal process which shapes the tonal melodies of polysyllabic words, can access the underlying tones of the compo-
3.1.2. The Negator ma- in Lhasa

Another revealing example of the interactions between syllable and word tones is furnished by the negator morpheme ma- in Lhasa Tibetan, which is used both with the perfective aspect (cf. the low-toned imperfective-aspect negator mi-) and in prohibitive commands. One unusual property of ma-, which always forms a single phonological word with the verb stem onto which it is tagged, is that its tone is always identical to the underlying tone of the verb stem, although owing to its non-initial position the latter itself always ends up bearing the default high tone. Since the inherent tone of the bound morpheme ma- cannot be ascertained (barring recourse to spelling pronunciation), we suggest that it is lexically unspecified for tone (i.e. bearing only a place-holder _ on the tone tier), and that its surface tone is automatically received from the verb stem by applying ordinary tone association (especially 7c above). The underlying tone on the verb stem is then nullified and reassigned with the default high tone under DTA. Consider the sample derivations of the negative forms of the perfective verb stems tê? 'saw' (<WT litas) and tsì? 'wrote' (<WT bris), respectively mā-tê? 'did not see' and mā-tsì? 'did not write' below (Qu 1981a:24):

(25) TA TN DTA

\[
\begin{array}{cccc}
\text{ma-tê?} & \text{mā-tê?} & \text{mā-te?} & \text{mā\textsuperscript{tsi}-tê?} \\
\text{H} & \text{H} & \text{H} & \text{H}
\end{array}
\]

33. Incidentally, the Purang data (as well as the data concerning the prefix ma- in Lhasa, see below) cause embarrassment to Duunmu's analysis, as all non-initial underlying tones are deleted from the tone tier at the start of the derivation, making it impossible for other tone rules to refer to them later.

34. The imperfective negator mi- in Purang Tibetan shows the same tonal behavior (Tan 1984: 637).
(26) T A T N D T A
ma-tṣi? ma-tṣi? ma-tṣi? ma''tṣi?
L L L L H

Since here the original syllable tone of the verb stem is inherited by the ma- morpheme on its left rather than completely obliterated by tone neutralization, a purely distributional approach to the problem at hand (such as Sprigg's prosodic analysis) will fail to give a principled account of the fact that ma- is high-toned in one case but low-toned in the other.

The preceding data present strong empirical evidence that, in synchronic word-formation at least, derivational relations do exist in Tibetan between tones of the constituent syllables and the melody of the polysyllabic word as a whole, and that, consequently, an adequate description of Tibetan tonology cannot do without 'tone sandhi' rules.

4. Concluding Remarks

We have witnessed in modern Tibetan a continuum of increasing tonality, reflecting various stages of the gradual emergence of lexically distinctive pitch. A typical tone system in Tibetan differs in two important respects from a typical Sinitic tone system: (i) the basic tonal contrast is that of simple pitch registers: high vs. low; (ii) the register contrast is realized only on the first syllable of a given phonological word.35 This type of tone system is so restricted that tone in polysyllabic Tibetan words may be viewed as adhering by and large to a simple tone template (where \( \omega \) = phonological word; \( \sigma \) = syllable; \( H \) = default high register):

35. Furthermore, word-tone can be completely obliterated by the overriding post-emphasis intonation at least in Lhasa Tibetan (see for example Sprigg 1981:36-7).
As indicated above (§1.1), some tonal dialects seem to be undergoing change in the direction of adding an intersecting dimension of contour contrast, level vs. falling, on the final syllable. One straightforward way of expressing this target of sound change in autosegmental phonology is to add a L to the right of the basic contrast of H vs. L, yielding four distinctive monosyllabic tone patterns: H, HL, L, and LL. The realizations of these four underlying tones in the Shigatse dialect is given in Table 6 below (Qu 1981a:189).38

<table>
<thead>
<tr>
<th>Realization</th>
<th>H</th>
<th>HL</th>
<th>L</th>
<th>LL</th>
<th>Syllable Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>53</td>
<td>51</td>
<td>12</td>
<td>131</td>
<td></td>
<td>short</td>
</tr>
<tr>
<td>55</td>
<td></td>
<td>113</td>
<td></td>
<td></td>
<td>long</td>
</tr>
</tbody>
</table>

Table 6. Shigatse Underlying and Surface Tones

To account for the fact that the contour contrast is limited to the last syllable in a polysyllabic word, we need only posit a simple rule which realizes (i.e. associates to the segmental tier) the second half of composite tones only at word-final position. The innovative tone template may then be represented as (28):

38. The level/fall contrast is restricted to short rather than long syllables in all three dBus-gsang dialects discussed in Qu 1981a. This is contrary to what is found in one variety of Lhasa where the rhyme gets compensatorily lengthened with the apocope of the glottal stop, resulting in the contour contrast being carried by long syllables (Kjellin 1977). Note that this means the contour distinction may not necessarily depend on bimoraic syllable structure, contra Yip 1992: §3.2.
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(28)

\[ \omega \]

\[ \sigma \] \quad (\sigma) \quad \sigma \]

\{ H \quad (H) \}

\{ L \}

\{ H \}

\{ HL \}

It is to be noted that in (28) the secondary contour distinction is superimposed on the basic tone template of (27), such that the final syllable, like all non-initial syllables, still bears the default high register.

In Sino-Tibetan, tone systems that are closest to the Tibetan one are those found in such dialects/languages as Dongkou (Xiang; Yue-Hashimoto 1987: §2.1) and New Shanghai (Northern Wu; Duanmu 1992) in Sinitic, and PaTani (West Himalayish, Saxena 1991), Tamang (Tamang-Gurung-Thakali-Manang; Mazaudon 1977: 54-7; Weidert 1987: §7.1.4; Sprigg 1990), and Konyak (Northern Naga; Weidert 1987: 215-6; 414-5) in Tibeto-Burman. All of these systems are characterized by initial-dominance (Yue-Hashimoto 1987: §2.1; Duanmu 1992:68), whereby in a polysyllabic domain the pitch pattern of the entire domain is borne solely by the initial syllable with the sweeping reduction of tonal contrast elsewhere. The tone systems of Dongkou Chinese and Tibetan differ from the other systems with respect to the behavior of tone on non-initial syllables. In the former systems, non-initial tones are largely independent of the initial tone, abiding by a more or less constant tonal template such as the ones shown in (27-28) for Tibetan. In the latter systems, however, the tonal melody of the initial syllable is mapped onto the entire polysyllabic tonal domain. Two distinct types of Sino-Tibetan word-tone systems, therefore, can be distinguished: template word-tone systems represented by Tibetan and Dongkou Chinese,\textsuperscript{17} and (adopting the terminology in Wei-

\textsuperscript{17} Template word-tone systems resemble some restricted tone systems labeled 'pitch accent' in the literature in their use of constraint rules to meet the 'one tone per phonological word' requirement. Unlike more typical 'pitch accent' systems such as standard Tokyo Japanese, however, template word tone systems as defined here do involve paradigmatic pitch contrasts.
dent 1979:84, fn. 28) contoureme word-tone systems represented by Tamang and New Shanghai Chinese. Needless to say, contoureme systems should represent the more fully tonal type on the tonality scale since the contrastive melodies in such systems are distributed (spread) to the individual component syllables in the domain, whereas in template systems non-initial syllables contribute little to the realization of the contrastive word-tones. 38

If, in summary, our phonological descriptions are to properly reflect this important distinction in the typology of Sino-Tibetan word-tone systems then tone-spreading or melody-mapping analyses, useful as they are for languages like New Shanghai, should be utilized only where they are really called for with languages like Tibetan.

38. The cases studies discussed in §3.2 constitute rare exceptions to this generalization.
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References


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